

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

- Ethylene production for PKN Orlen amounted to 351,000 tons in the first three quarters against 219,100 tons in the same period in 2021
- Ethylene production at Tiszaujvaros and Bratislava dropped from 632,000 tons in January to September 2021 to 490,000 tons, whilst propylene dropped from 323,000 tons to 252,000 tons and butadiene (produced only at Tiszaujvaros) fell from 76,000 tons to 55,000 tons.
- Central European synthetic rubber export and import prices showed strong rises over the course of the first nine months, although market numbers may have already peaked
- The Polimery Police project in northern Poland had achieved 96% of its construction schedule by the end of August. Start-up is scheduled for the first quarter in 2023
- The polyol project at Tiszaujvaros was originally scheduled to start in mid-2021 but progress slowed due to firstly the pandemic followed by the impact of the war in Ukraine
- Exports of methanol from Poland amounted to 328,972 tons in the first nine months against 137,118 tons in January to September 2021

Russian chemical production

- Quarterly production of mainstream petrochemical in Russia fell to 3.9 million tons in the three months from July to September 2022 against 4.2 million tons in the same quarter in 2021 and 4.1 million tons in 2020
- Russian propylene production amounted to 2.144 million tons in the first nine months in 2022 against 2.276 million tons in the same period in 2021
- Russian polypropylene production totalled 1.457 million tons in the first three quarters in 2022 against 1.537 million tons. The reduction in output was due to a number of scheduled production shutdowns
- In the first nine months in 2022 Russian polymer production declined by 3.2% over the same period in 2021, dropping to 7.760 million tons
- Russia produced 3.323 million tons of methanol in the first nine months in 2022 against 3.235 million tons in the same period in 2021

Project news

- Central Asia (GCC) has identified Enter Engineering as the EPC contractor for the MTO project in Uzbekistan
- SIBUR began exporting maleic anhydride from Tobolsk in October with the first batches sent to India
- The first unit intended to start production at Nakhodka from the NZMU fertiliser complex, under construction, is expected to be the 1.8 million tpa methanol plant

CENTRAL and SOUTH EAST EUROPE

Orlen & MOL Groups Financial Performance Jan-Sep 2022

Orlen Group Jan-Sep 2022

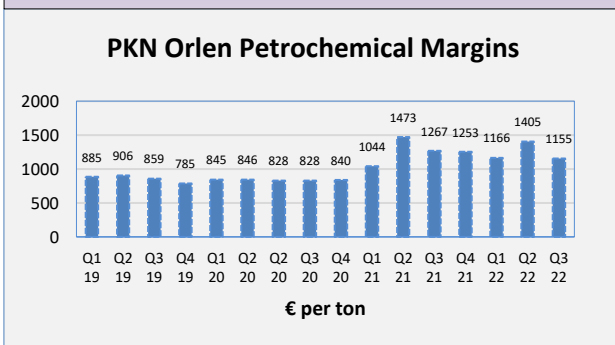
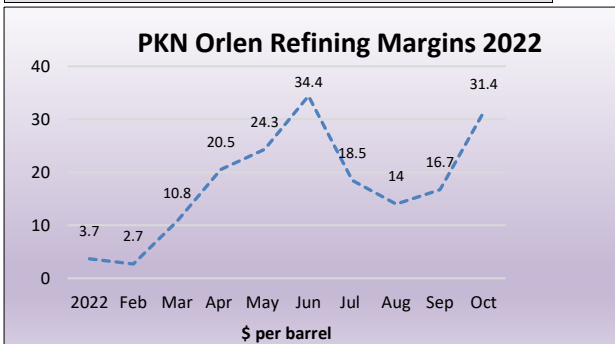
The Orlen Group's total revenues increased by 95% in the first three quarters in 2022 to €37.595 billion compared to €19.837 billion in the same period in 2021. This included €27.361 billion from PKN Orlen which is the largest individual company in the group. The increase of sales revenues for the Orlen Group was driven by higher volume sales in all operating segments, combined with a 55% rise in crude oil prices. The increase of sales revenues was also helped by the consolidation of Lotos. The Orlen Group's sales revenues in the third quarter amounted to €15.590 million which was €7.81 million higher than in the same quarter last year.

Orlen Group Jan-Sep 2022 (€ billion)		
	Orlen Group	PKN Orlen
Sales Revenues	37.595	27.361
Operating Profit	6.099	2.371

Orlen Group-Saudi agreements on crude and petrochemicals

In the third quarter PKN Orlen concluded a long-term agreement on crude oil deliveries from Saudi Arabia, ranging from 200 to 337,000 barrels daily. PKN Orlen also concluded with Saudi Aramco and SABIC a memorandum of understanding on cooperation to analyse, prepare and realize common investments in petrochemical segment. Potential areas of cooperation for Poland and Central Europe are being analysed including the development of projects in olefins and aromatics combined with derivatives.

Operating costs for the Orlen Group increased by €14.490 billion over January to September 2021 to €32.270 billion, mainly as a result of an increase in the prices of basic raw materials and energy driven to a large extent by the ongoing Russian-Ukrainian war. Other factors included the higher processing of crude oil by 4.5 million tons following the acquisition of Lotos.



The Orlen Group's model refining margin amounted to \$16.4 per barrel in the third quarter against \$26.5 in the second quarter. PKN Orlen expects a temporary increase in refining margins on European markets in the coming quarters, while petrochemical margins remain at around €1,000 per ton. The refining margin may benefit from an increase in demand for diesel from the energy sector, which uses diesel as a substitute for natural gas.

Orlen-petrochemical production Jan-Sep 2022

Ethylene production for PKN Orlen in the first three quarters amounted to 351,000 tons against 219,100 tons in the same period in 2021. Propylene production increased from 228,800 tons to 324,000 tons whilst butadiene production rose from 26,700 tons to 47,700 tons.

PKN Orlen Production (unit-kilo tons)

Product	Jan-Sep 22	Jan-Sep 21
Ethylene	351.0	219.1
Propylene	324.0	228.8
Butadiene	47.7	26.7
Toluene	6.0	8.5
Phenol	33.1	35.5
Polyethylene	190.2	85.5
Polypropylene	250.0	207.6

In the polyolefin division the Orlen Group increased production of polyethylene from 85,500 tons in January to September 2021 to 190,200 tons in the same period this year whilst polypropylene increased from 207,600 tons to 250,000 tons.

Orlen petrochemical revenues

Petrochemical revenues for the Orlen Group rose from €2.638 billion in January to September 2021 to €5.073 billion in the same period this year, whilst production costs increased from €2.379

billion to €4.615 billion. In the petrochemical sector ethylene prices rose by 38% over 2021 and propylene prices by 41%.

PKN Orlen's Petrochemical Division (€ billion)		
	<i>Jan-Sep 22</i>	<i>Jan-Sep 21</i>
Segment revenues	5.073	2.638
Costs	-4.615	-2.379
Operating profit/(loss) (EBITDA)	0.599	0.650

Orlen's profitability increased more modestly in the petrochemical sector than in the refining sector. Aside sharp rises in crude and other feedstock costs, revenues were helped by higher product sales rising in the first nine months in most product areas.

PKN Orlen Petrochemical Margins (€/ton)				
<i>Product</i>	<i>Q4 21</i>	<i>Q1 22</i>	<i>Q2 22</i>	<i>Q3 22</i>
Ethylene	715	664	810	639
Propylene	730	679	820	598
Toluene	153	155	450	619
Benzene	298	333	422	429
Butadiene	638	410	547	614
Paraxylene	344	262	393	586

Ethylene margins dropped in the third quarter from €810 per ton to €639 whilst propylene fell from €820 per ton to €598. Lower petrochemical margins for ethylene and propylene in the third quarter helped restrict margins for polyolefins. At the same time butadiene margins rose from €547 per ton to €614, whilst benzene increased from €422 to €429. Paraxylene margins showed the sharpest increase in the third quarter, rising from €393 per ton in the second quarter to €586 per ton.

PKN Orlen Product Revenues (€ million)		
<i>Product group</i>	<i>Jan-Sep 22</i>	<i>Jan-Sep 21</i>
Monomers	885.7	453.0
Polymers	760.5	427.7
Aromatics	332.9	206.9
Fertilisers	438.2	110.2
Plastics	519.4	281.6
PTA	447.4	255.0

Revenues from ethylene, propylene and butadiene rose from €453.0 million in the first nine months in 2021 to €885.7 million in the same period this year, with polymers rising from €427.7 million in January to September 2021 to €760.5 million in 2022. PTA revenues increased from €255.0 million in the first three quarters in 2021 to €447.4 million, with sales volumes rising from 287,000 tons to 330,000 tons.

PKN Orlen Group Chemical Sales (unit-kilo tons)		
<i>Product group</i>	<i>Jan-Sep 22</i>	<i>Jan-Sep 21</i>
Monomers	689	525
Polymers	500	438
Aromatics	298	248
Fertilisers	723	877
Plastics	288	240
PTA	452	424

Ethylene sales for the Orlen Group amounted to 323,000 tons in the first nine months in 2022 against 222,000 tons in the same period last year whilst propylene sales rose from 303,000 tons to 374,000 tons.

Overall, it meant that monomer sales rose from 525,000 tons in the first nine months in 2021 to 689,000 tons in the same period in 2022. In the polymer division PKN Orlen is acquiring the LDPE business from Basell Orlen Polyolefins, which should be completed by the end of 2022.

MOL Jan-Sep 2022

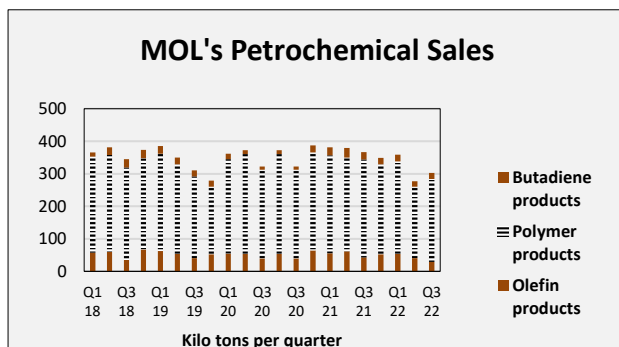
MOL reported a significant rise in third-quarter net profit and EBITDA, boosted by strong refining margins in spite of a government-imposed fuel price cap in Hungary. MOL raised its EBITDA outlook for 2022 to about \$4.1 billion-\$4.4 billion from its previous guidance of \$3.3 billion. MOL's Danube refinery and Slovnaft's Bratislava refinery both continue to receive Russian crude through the Druzhba pipeline as part of the exemptions permitted by the EU. Receiving cheap Russian Urals by pipeline has helped maintain high margins for MOL even though the Hungarian government has imposed windfall taxes on the company.

MOL's Olefin & Polyolefin Production (unit-kilo tons)		
<i>Product</i>	<i>Jan-Sep 22</i>	<i>Jan-Sep 21</i>
Ethylene	490	632
Propylene	252	323
Butadiene	55	76
Raffinate	88	114
<i>Product</i>	<i>Jan-Sep 22</i>	<i>Jan-Sep 21</i>
LDPE	161	200
HDPE	222	301
PP	337	411

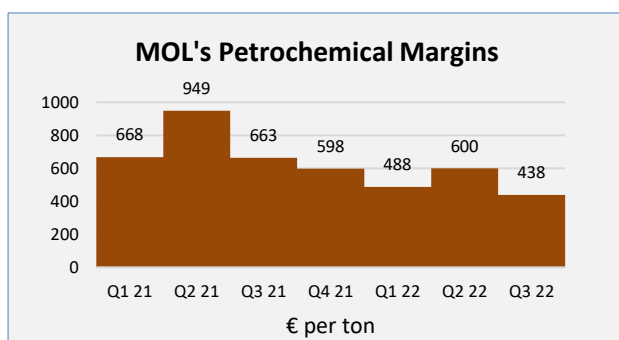
In the petrochemical division MOL's production of olefins and polyolefins dropped in the first three quarters in 2022 due to extended maintenance. Ethylene production at Tiszaújváros and Bratislava dropped from 632,000 tons in January to September 2021 to 490,000 tons, whilst propylene fell from 323,000 tons to 252,000 tons and butadiene (produced only at Tiszaújváros) fell from 76,000 tons to 55,000 tons. Declines in propylene and butadiene production this year by MOL have affected the volume

of Hungarian exports. Polyethylene exports from MOL have also been limited by lower production in 2022. MOL's LDPE production fell from 200,000 tons to 161,000 tons and HDPE production fell from 301,000

tons to 222,000 tons. Polypropylene production dropped in the first three quarters in 2021 from 411,000 tons to 337,000 tons in January to September 2022 although this decline did not affect export activity.



MOL's downstream EBITDA increased by 70% to \$741.2 million in the third quarter, mainly driven by the refining sector. This meant that MOL posted a quarterly net profit of 262.1 billion forints (\$632.91 million), up from 119.3 billion in the third quarter of 2021. The planned major maintenance of the Százhalombatta refinery was successfully completed in the Q3 period.



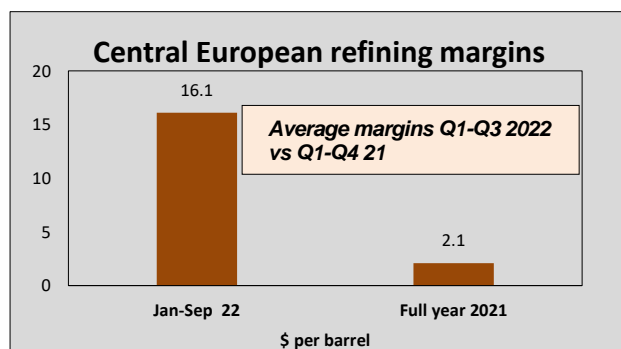
After a temporary rise in Q2 2022, the petrochemical margin decreased further in the third quarter. The peak of petrochemical margins in 2021-2022 took place in Q2 2021 when €949 per ton was achieved but since then there has been downward trend. Lower margins for petrochemicals translated into a lower EBITDA of Ft 19.9 billion for the third quarter, which is by far the weakest financial return for several years.

Central European refining Jan-Sep 2022

Refining margins and volumes

Most of the refineries in Central and South East Europe have reported record margin rises this year although processing volumes are only slightly higher than in 2021. Even though margins dipped in the third quarter against the second quarter, they remained much higher than in the comparative quarter in 2021.

OMV Petrom's refining margin declined from \$24.4 per barrel in Q2 to \$17.1 in Q3 but was still higher than in Q3 2021 by \$9.9. After witnessing month by month declines in the third quarter PKN Orlen's model refining margin rebounded to \$31.4 per barrel in October versus \$16.7 in September. MOL continues to suppress its margins on a monthly basis, and now also on a quarterly basis. Romanian refineries, including one owned by Russia's Lukoil have found alternative fuel supplies from December when a ban on Russian imports takes hold. The Petromidia refinery, owned by Rompetrol Rafinare, majority controlled by KMG International (KMGI) uses Kazak crude.



The EU embargo on Russian seaborne crude deliveries comes into effect from 5 December, with some exemptions such as to Bulgaria, Slovakia and Hungary providing time to adapt to new sources. Even though pipeline deliveries via the Druzhba have thus far been excluded from EU sanctions it is incumbent on those countries receiving Russian crude to seek out other forms

of supply. Not even deliveries via the Druzhba though can be guaranteed as the constant artillery and missile bombardment occasionally damages the pipeline or related equipment.

Romanian refineries, margins and feedstocks

The Petromidia refinery processed 3.817 million tons of crude in the first nine months in 2022 against 3.326 million tons in the same period in 2021. Rompetrol Rafinare recorded a gross turnover of \$4.87 billion in the first three quarters and an operational profit (EBITDA) of \$327 million, as a result of higher margins. The Petrotel Ploiesti refinery, controlled by Lukoil, which would have stopped receiving Russian crude oil from December, has found an alternative supplier of crude oil. Petrotel is the smallest of the three large refineries in Romania and has a refining capacity of about 2.7 million tpa of crude oil. The refinery receives

exclusively crude oil by sea from Constanta, whilst also taking crude oil from the Russian port of Novorossiysk. Thus, the refinery would be subject to the oil embargo imposed by the Europeans from 5 December for Russian oil imported by sea.

OMV-new aromatics investment

OMV Petrom is investing around €130 million in the next 3 years to build a new unit of aromatic products at Petrobrazi refinery. The processing capacity of the new unit is about 1,500 tons per day of reformed gasoline.

The new unit of aromatic products will be put into operation in 2026. It will ensure continuity of production of gasoline with a benzene content of less than 1%, according to current European standards. At the same time, a larger amount of toluene will be possible to be obtained from the process of gasoline production. Toluene can be used to obtain commercial gasoline with improved octane number, but it can also be used as a solvent in the chemical industry to obtain paints, adhesives or in processes of obtaining leather products.

OMV Petrom at its Petrobrazi refinery at Ploesti stopped importing Russian products in March in agreement with EU objectives. The company continues to diversify energy import sources in order to secure its supply chain, including through booking LNG capacity. The company produces around 75%-80% of the crude it processes at its Petrobrazi 4.5 million tpa refinery and of the natural gas it sells and uses to produce electricity.

NIS refining levels in Jan-Sep 2022 and possible nationalisation

Serbian refining company NIS increased its processing volume in first nine months of 2022 14% over the same period in 2021, and achieved the highest amount of crude since 2009.

For now, NIS can operate normally as its refineries have been retooled to handle oil from Iraq and other countries and because of Belgrade's exemption from EU sanctions on Russian companies. However, Serbia is considering a move to retake majority control of NIS from Russia's Gazprom Neft as it rushes to protect itself from the impact of sanctions on Moscow. From December EU sanctions mean Croatia will be barred from transporting Russian oil shipments to Serbia.

Central European Refining Volumes (unit-mil tons)		
Company	Jan-Sep 22	Jan-Sep 21
INA	3.3	2.2
Lotos	6.0	7.3
Lukoil Bourgas	1.9	3.5
Lukoil Ploiesti	2.1	1.7
MOL	7.9	9.6
NIS	3.3	2.9
Orlen-Lietuva	5.7	5.0
Orlen-Plock	13.6	9.1
Petrom	3.4	3.5
Rompetrol	4.1	3.6
Slovnaft	2.0	2.8
Orlen Unipetrol	5.1	4.8
Total	58.1	55.9

Slovnaft to reduce Russian crude to about 60%

Slovnaft aims to cut the share of Russian oil in its processing activities next year to about 60% from about 95% at present and use other blends to comply with sanctions on Russia. Slovnaft processes around 124,000 barrels per day and exports its products across central Europe, has been using Russian oil supplied by the Druzhba pipeline but is accelerating modifications to use other blends.

Orlen Group and east Germany

Orlen Group's crude oil throughput amounted to 10.5 million tons in the third quarter, of which PKN Orlen's output was increased by 1.7 million tons by the inclusion of the Lotos Group.

Orlen Unipetrol achieved 300,000 tons more in the third quarter over the second quarter, as a result of

operating of Kralupy and Litvinov refineries in a full production mode after maintenance shutdowns in 2Q22. Orlen Lietuva in Lithuania increased throughput by 1.2 million tons in the third quarter due to completed maintenance in the second quarter.

In eastern Germany the Schwedt refinery has started to take oil supplies from the Polish Naftoport which would enable the refinery to become independent of gas supplies from Russia. Deliveries via Gdansk are possible and need to be increased as the refinery strives to relieve itself of any dependency from Russia crude. At the same time Poland is seeking German support to apply EU sanctions on the Polish-German section of the Druzhba crude pipeline so Warsaw can abandon a deal to buy Russian oil next year without paying penalties.

Central European Olefin Production & Trade

Polish Imports of Propylene (unit-kilo tons)

Country	Jan-Sep 22	Jan-Sep 21
Lithuania	0.000	6.415
Bulgaria	5.015	0.000
Croatia	5.905	0.000
Germany	45.127	76.522
Russia	23.132	41.519
Ukraine	19.020	55.838
Hungary	3.918	0.000
Others	5.849	0.012
Total	107.967	180.306

Polish propylene & butadiene imports, Jan-Sep 22

Poland imported 107,967 tons of propylene in the first nine months in 2022 against 180,306 tons in the same period in 2021. Imports have fallen this year due mainly to higher production at Plock.

Average prices for propylene imports into Poland rose from €819 per ton in January to September 2021 to €1292 in the same period in 2022. Prices started falling in the latter part of the third quarter following feedstock trends.

Polish Butadiene Imports (unit-kilo tons)

Country	Jan-Sep 22	Jan-Sep 21
Austria	23.794	33.130
Czech Republic	0.952	4.057
Germany	3.459	0.000
Hungary	16.491	27.222
Others	29.224	35.880
Total	73.925	100.288

Germany supplied 45,127 tons of propylene to Poland in the first nine months against 76,522 tons in 2021 whilst imports from Ukraine dropped from 55,838 tons to 19,020 tons. Russia reduced shipments to 23,132 tons from 41,519 tons. Imports of propylene into Poland included 5,015 tons from Bulgaria and 5,905 tons from Croatia.

Butadiene imports into Poland totalled 73,925 tons in the first nine months in 2022 against 100,288 tons in the same period in 2021. The three largest suppliers comprised Hungary, Germany and Austria. Styrene imports fell from 82,307 tons to 80,320 tons. The Netherlands is the largest supplier of styrene to the Polish market, most of which is purchased by Synthos.

Hungarian Propylene Exports (unit-kilo tons)

Country	Jan-Aug 22	Jan-Aug 21
Germany	4.283	4.748
Poland	3.918	0.000
Slovakia	42.153	68.171
Others	0.000	2.994
Total	50.354	75.912

Hungarian propylene exports Jan-Aug 2022

Exports of propylene from Hungary dropped in the first eight months from 75,912 tons in January to September 2022 to 50,354 tons in the same period this year. Exports to Slovakia from MOL to Slovnaft dropped from 68,171 tons to 42,153 tons which was due to lower production at Tiszaújváros.

Czech Petrochemical Exports (unit-kilo tons)

Product	Jan-Sep 22	Jan-Sep 21
Ethylene	10.298	18.719
Propylene	0.031	4.014
Butadiene	1.100	2.453
Benzene	29.186	35.006
Toluene	5.089	6.728
Ethylbenzene	79.271	83.929

Czech petrochemical trade, Jan-Sep 2022

Ethylene exports from the Czech Republic dropped from 18,719 tons in the first nine months in 2021 to 10,298 tons in the same period this year. This included deliveries of 1,723 tons of ethylene sent to India, 3,268 tons to Germany and 3,266 tons to Slovakia.

Czech imports of ethylene rose from 3,193 tons in the first nine months last year against 16,034 tons in January to September 2022. Germany supplied 15,887 tons to the Czech Republic this year for €18.778 million, averaging €1.181 per ton.

Czech Petrochemical Imports (unit-kilo tons)

Product	Jan-Sep 22	Jan-Sep 21
Ethylene	16.034	3.193
Propylene	28.899	35.349
Butadiene	51.847	60.613
Benzene	55.135	57.987
Toluene	5.275	5.395
Styrene	13.020	55.560

Propylene imports into the Czech Republic dropped from 35,349 tons in the first nine months in 2021 to 28,899 tons in the same period in 2022, with main suppliers including Germany, Romania and Poland. Czech imports of butadiene dropped from 60,813 tons in January-September 2021 to 51,847 tons in the same period in 2022. Germany was the largest supplier, shipping 44,661 tons in January to September.

Czech exports of ethylbenzene amounted to 79,271 tons in the first nine months against 83,929 tons in the same period in 2021. All the ethylbenzene was shipped from Kralupy to Oswiecim, all within the structures of the Synthos Group. Benzene exports from the Czech Republic rose in the first nine months this year to 29,186 tons against 35,066 tons in the same period in 2021. Germany was the primary market for Czech benzene exports, accounting for 21,279 tons for €21.388 million.

Imports of benzene dropped slightly from 57,987 tons to 55,135 tons. Czech benzene imports were sourced in the first nine months this year from Poland (21,742 tons for €24.940 million), Serbia (6,355 tons for €6.298 million) and Hungary (6,959 tons for €7.335 million).

Czech PVC Exports		
	Jan-Sep 22	Jan-Sep 21
Vol ktons	91.2	95.3
Value € mil	156.6	107.4

Czech PVC exports Jan-Sep 2022

Spolana exported 78,823 tons of PVC in the first nine months this year against 95,310 tons in the same period in 2021. Revenues from PVC exports increased from €107.401 million to €156.638 million, after average prices rose from €1113 per ton to €1717 per ton.

Italy was the largest destination for Spolana's exports this year, after shipments to Poland reduced from 23,132 tons in January to September 2021 to 31,347 tons. In order to support PVC production at Neratovice the Czech Republic imported 59,900 tons of ethylene dichloride from Germany in the first nine months in 2022 versus 38,209 tons in the same period in 2021.

Central European Polyolefin Production & Trade

Polish Polyethylene Trade		
Exports	Jan-Sep 22	Jan-Sep 21
Vol (kilo tons)	260,458	285,115
Value (€ million)	436,422	399,259
Imports	Jan-Sep 22	Jan-Sep 21
Vol (kilo tons)	1008.351	1051.376
Value (€ million)	1840.204	1568.732

Polish polyethylene trade Jan-Sep 2022

Polish imports of polyethylene totalled 1.003 million tons in the first nine months in 2022 against 1.051 million tons in the same period in 2021. Average prices for polyethylene imports into Poland rose to €1986.8 per ton in the first nine months in 2022 against €1492.1 in the same period in 2021.

Costs of polyethylene imports amounted to €1.840 billion in January to September 2022 against €1.568 billion. HDPE is the largest category of imported polyethylene into Poland, amounting to 347,691 tons in the first nine months this year versus 361,082 tons in January to September 2021.

Polish PE Exports (unit-kilo tons)		
Category	Jan-Sep 22	Jan-Sep 21
LDPE	46.114	49.723
LLDPE	16.164	12.936
HDPE	176.530	108.340
EVA	2.728	1.585
EAC	15.397	15.540
Other	3.524	4.016
Total	260.457	192.140
Polish PE Imports (unit-kilo tons)		
Category	Jan-Sep 22	Jan-Sep 21
LDPE	266.051	289.809
LLDPE	184.819	189.065
HDPE	347.691	361.082
EVA	13.465	16.527
EAC	145.134	156.104
Other	46.441	38.790
Total	1003.601	1051.377

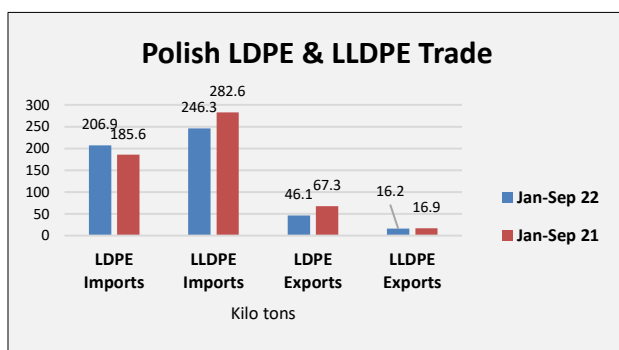
Polish polyethylene exports amounted to 269,599 tons in the first nine months in 2022 versus 332,107 tons in the same period in 2021; the rise due to higher production.

Average prices for polyethylene exports into Poland rose to €1675.67 per ton in the first nine months in 2022 against €1400.3 in the same period in 2021. Revenues from exports increased from €399.259 million in January to September 2021 to €436.422 million in 2022.

Orlen-LDPE project assessment

PKN Orlen is currently undertaking assessment for the construction of a new LDPE plant at Plock. Thus far, it has signed a license and base project agreement with LyondellBasell. Lupotech T technology provided by LyondellBasell accounts for more than 14 million tpa of LDPE/EVA polymer globally based on more than 70 production lines. The capacity of the new unit is expected to be 250,000 tpa. Orlen's LDPE market share

increased this year through the acquisition of the assets from Basell Orlen Polyolefins (BOP).



After the conclusion of the BOP purchase PKN Orlen will become the sole producer of LDPE in Poland, covering about a third of the domestic demand. Overall, the market is dominated by imports which amounted to 152,483 tons in the first nine months in 2022 against 146,754 tons in the same period in 2021.

Poland is also the largest consumer of LDPE polyethylene in Central Europe. According to forecasts, in 2025 the LDPE market in Central Europe will grow to approximately 890,000

tons, including around 312,000 tons for Poland against around 300,000 tpa at present.

Polish PP Exports (unit-kilo tons)		
Category	Jan-Sep 22	Jan-Sep 21
PP homo	150.885	139.822
Polyisobutylene	0.215	0.453
Propylene copolymers	65.243	52.906
Other	4.911	2.407
Total	221.254	195.589
Av €/ton	1782.445	1463.821
Polish PP Imports (unit-kilo tons)		
Category	Jan-Sep 22	Jan-Sep 21
PP homo	467.892	547.785
Polyisobutylene	2.977	3.226
Propylene copolymers	229.059	250.681
Other	15.632	18.832
Total	715.560	820.524
Av €/ton	1843.087	1541.303

Polish polypropylene trade Jan-Sep 2022

Polish polypropylene imports, including homo grade and copolymers, fell in the first three quarters to a total of 715,660 tons versus 820,524 tons in the same period in 2021. Average prices per ton increased from €1541.3 per ton to €1843.1 per ton. Homo grade polypropylene dropped from 547,785 tons to 467,892 tons whilst copolymer imports dropped from 250,681 tons to 229,059 tons. Regarding export activity shipments increased to 221,254 tons for €394.373 million against 195,588 tons in January to September 2021 for €286.307 million.

In addition to the dependency on propylene monomer imports, Poland has in recent years been increasing its imports of polypropylene and propylene copolymers. Imports of polypropylene from Russia were one of the main sources in 2021, amounting to 155,805 tons from a total of 727,232 tons. In value terms this amounted to

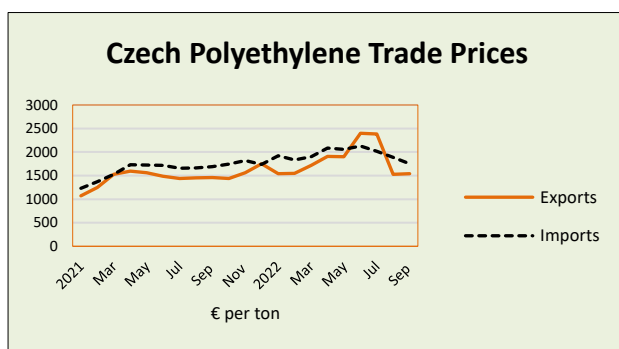
€198.656 million from a total value of €1100.731 million. This year the position has changed due to the economic impact resulting from Russia's invasion of Ukraine. Imports of polypropylene from Russia into Poland have fallen in recent months to less than 200 tons in July.

Polimery Police-Design, Procurement, etc	
Month	% Progress
Jan 22	83%
Apr 22	90%
Aug 22	97%
Sep 22	99.9%

costs estimated in the range of \$1.8 billion. By the general material progress of the work including the design, procurement and delivery, the overall progress rate at the end of September amounted to 99.99%.

In the third quarter this year, a range of engineering tasks were undertaken including hydrotesting of above ground and underground pipelines, cabling, electrical equipment and automation. On the territory of the transshipment and storage terminal, painting and insulation works on propane and ethylene storage tanks were completed.

Gryfilen, as Grupa Azoty informs on its official website, is the trade name for polypropylene that will sold from the Polimery Police plant. Grupa Azoty Polyolefins S.A. will be responsible for the production. The Polimery Police project will enable the diversification of Grupa Azoty's business activities and help to meet demand in the Polish plastics segment. Production is based on capacities of 429,000 tpa of propylene and 437,000 tpa of polypropylene. At current progress rates, the aim is to start production in the first quarter in



2023. The scope of the project also includes a gas port, a transshipment and storage terminal, providing the possibility of obtaining the raw materials necessary for the production by sea.

Czech polyethylene trade Jan-Sep 2022

As illustrated in the graphic opposite prices for Czech polyethylene trade peaked around June-July this year with subsequent declines seen over the third quarter. These price trends are replicated elsewhere in Europe.

Orlen Unipetrol Polyolefin Exports

HDPE	Jan-Sep 22	Jan-Sep 21
Vol (ktons)	269.112	239.602
Value (€ mil)	430.935	328.898
Av € per ton	1.601	1.373
PP	Jan-Sep 22	Jan-Sep 21
Vol (ktons)	192.064	206.629
Value (€ mil)	329.619	283.153
Av € per ton	1.716	1.370

Czech HDPE exports increased in the first nine months to 269,112 tons against 239,602 tons in the same period in 2021, with revenues amounting to €430.935 million up from €328.898 million. Although polypropylene exports dropped by volume from 206,629 tons to 192,064 tons, values rose from €283.153 million in January to September 2021 to €329.619 million this year.

For imports of all forms of polyethylene, Czech inward shipments dropped from 259,842 tons in the period January to September 2021 to 238,949 tons in 2022. Exports of polyethylene totalled 308,907 tons in the first three quarters, up from 284,986 tons. Due to higher production this year at Orlen Litvinov exports of polyethylene have been higher and imports lower.

Czech Polyethylene Trade (unit-kilo tons)

Trade Flow	Jan-Sep 22	Jan-Sep 21
Exports	308.907	284.986
Imports	238.949	259.842

Rompertrol Rafinare-petrochemicals division Jan-Sep 2022

Product	Jan-Sep 22	Jan-Sep 21
Propylene processed	92	74
Ethylene processed	31	27
Polymer production	94	73
Polymer sales	106	89

Rompertrol Rafinare sold 106,000 tons of petrochemicals in the first nine months in 2022, against 89,000 tons in the same period in 2021. Rompertrol Rafinare increased polymer processing from 73,000 tons in January to September 2021 to 94,000 tons in the same period in 2022. Polymer processing increased from shipped around 57% of its petrochemical sales in the first half of 2022 to the Romanian domestic market followed by 15% to the Bulgarian market. Rompertrol Rafinare has set a minimum target of 87,100 tons of polypropylene sales for the whole of 2022.

Rompertrol Rafinare Polymer Division (\$ million)

	Jan-Sep 22	Jan-Sep 21
Turnover	166.4	146.3
EBITDA	46.3	10.0
Net profit	63.0	5.5

Hungarian polymer exports Jan-Aug 2022

Hungarian exports of polyolefins, polystyrene and PVC all increased in value in the first three quarter in 2022, although overall volumes have been lower due to lower production at Tiszaújvaros. LDPE export prices from Hungary rose in the first three quarters to €1734 per ton on average measured against €1502 in the same period in 2021.

Hungarian Exports of Polymers (unit-kilo tons)

Product	Jan-Aug 22	Jan-Aug 21
LDPE	60.455	77.258
HDPE	151.472	196.578
EVA	0.087	0.074
EO	0.279	2.599
Other PE	3.560	2.599
PP-Homo grade	80.887	76.410
Propylene Copolymers	65.914	80.634
PVC	163.941	184.420
MDI	138.257	149.591
SBR	21.112	9.654

HDPE prices rose from €1380 per ton to €1675 per ton, with volumes dropping from 196,578 tons to 151,472 tons. Polyolefin production at Tiszaújvaros was lower in the first three quarters in 2022 due to maintenance. MOL exports most of its HDPE production whilst LDPE is sold more on the domestic market.

Further maintenance on MOL's petrochemical facilities took place in August, thus affecting olefin and

polyolefin production in the third quarter. Slovnaft in Slovakia has also undertaken shutdowns in recent months which have limited production this year.

Hungarian Imports of Polymers		
Product	Jan-Aug 22	Jan-Aug 21
LDPE	53.892	52.177
HDPE	69.055	67.632
EVA	4.021	3.531
EAO	8.021	8.213
PP-Homo grade	1.406	1.833
Propylene Copolymers	10.869	9.077
Exp PS	29.573	22.443
GPPS	12.784	26.879
SAN	18.825	7.914
ABS	57.431	29.566

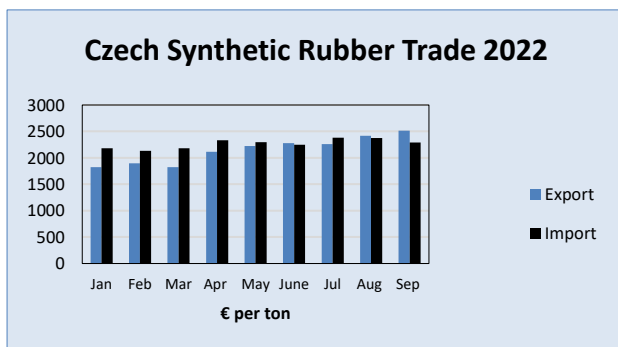
Over the first nine months this year Slovak exports of polyethylene to the Czech Republic totalled 14,810 tons against 19,076 tons in the same period in 2021. Slovnaft produced 267,000 tons of polypropylene in 2021 against 264,000 tons in 2020, whilst LDPE production rose from 190,000 tons to 195,000 tons. Polyolefin production increased in 2021 due to higher demand resulting from COVID. Around 90% of polymer sales are sent by Slovnaft for export, mainly to Central European countries.

HIP-Petrohemija-PE exports and feedstocks

HIP Petrohemija exported 82,000 tons of polyethylene in the first eight months in 2022 against 80,000 tons last year, whilst sales revenues rose from increased from \$128.7 million to \$143.4 million. Average prices per ton rose from \$1608 to \$1729 in 2022.

Having been taken over by NIS last year feedstocks now represent the main concern for HIP Petrohemija, due to the Russian ownership of NIS. Serbia is considering a move to retake majority control of NIS from Russia's Gazprom Neft as it rushes to protect itself from the impact of sanctions. From December EU sanctions mean Croatia will be barred from transporting Russian oil shipments to Serbia. Thus there is urgency behind the Serbian government's attempts to find out sources of crude.

Central European Rubber Markets



Synthetic rubber prices Jan-Sep 2022

Central European synthetic rubber export and import prices showed strong rises over the course of the first nine months, although market numbers may have already peaked. Export prices for Czech shipments increased from €1824 per ton in January to €2516 per ton in September whilst import prices rose more modestly from €2182 to €2288. However, import prices had achieved €2384 per ton in July and thus declined in both August to September. By contrast average prices for

Czech exports jumped sharply over the third quarter, rising 10.3% over the three months. Partly this rise can be attributed to the delayed impact from feedstock costs but from October export numbers have started to follow import numbers downwards.

Czech Exports of Butadiene Rubber 2022			
	Q1 22	Q2 22	Q3 22
Volume (Ktons)	28.309	28.588	26.583
Value (€ million)	51.849	63.919	64.739
Av € per ton	1.832	2.236	2.435

Synthetic rubber futures in Europe continued to fall during the last week of October, with all commodities registering week-on-week declines throughout the entire month. Butadiene prices fell back by 6% at the end of October followed by butadiene rubber which saw a 4.2% drop in the last week of the month. EPDM rubber saw the smallest decrease of just under 1%, while styrene butadiene rubber

was down 3.4% week-on-week. Butadiene rubber export prices from the Czech Republic rose from €1832 per ton in the first quarter to €2435 in the third quarter but are now showing declines in the fourth quarter.

Czech exports of synthetic rubber amounted to 147,826 tons in the first nine months in 2022 versus 158,589 tons in the same period in 2021. Imports rose slightly from 121,507 tons to 123,000 tons in

January-September 2022. Natural rubber imports dropped from 72,427 tons in the first three quarters in 2021 to 61,994 tons.

Sanctions on Russia have started to affect imports of certain grades of synthetic rubber, particularly butadiene rubber and halogenated butyl rubber. For both products EU sanctions have been applied from 10 July. For butadiene rubber there are alternative suppliers able to fill the market gaps. However, buying halogenated rubber (HBR) is far more complicated as the Russian producer Nizhnekamskneftekhim is only one of three producers globally. HBR is used in the manufacture of tubeless tyres and is one of the most types of synthetic rubber. Czech imports amounted to 4,866 tons in January to September 2022 for €12.403 million. Russia supplied 3,572 tons, or 73% of total imports, nearly all of which was supplied in the first half of the year.

Czech Exports of ESR 2022			
	Q1 22	Q2 22	Q3 22
Volume (Ktons)	20.813	19.411	13.595
Value (€ million)	35.917	40.747	30.390
Av € per ton	1.726	2.099	2.235

decline is attributed to reduced production at Kralupy after Synthos announced reduced utilisation rates at its three plants in Central Europe due to higher production costs.

Synthos Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Polystyrene	52.9	53.9
EPS	76.1	79.1
Synthetic Rubber	208.0	210.8

synthetic rubber. Synthetic rubber production at Oswiecim rose

Polish Synthetic Rubber Imports (unit-kilo tons)			
Product	Q1 22	Q2 22	Q3 22
ESBR	13.923	7.958	9.683
S-SBR	7.417	5.489	6.784
Butadiene Rubber	11.584	17.118	15.898
Butyl Rubber	1.035	1.078	0.684
HBR	3.780	5.269	3.155
NBR	3.597	4.335	3.200
Isoprene Rubber	10.396	8.097	6.243
EPDM	11.712	12.857	10.882
Others	14.870	14.907	14.591
Total	78.313	77.108	71.119

Polish Synthetic Rubber Imports from Russia (unit-kilo tons)			
Product	Q1 22	Q2 22	Q3 22
ESBR	9.622	2.423	2.811
S-SBR	0.081	0.000	0.000
Butadiene Rubber	3.882	9.692	4.923
Butyl Rubber	0.215	0.266	0.179
HBR	3.688	5.143	2.850
NBR	2.197	2.493	1.154
Isoprene Rubber	10.286	7.876	5.878
EPDM	0.110	0.132	0.000
Others	12.518	12.782	6.091
Total	42.599	40.807	23.885

Synthos-production & outlook Jan-Sep 2022

Production volumes for Synthos in Poland were slightly down this year in the first three quarters for general purpose polystyrene. EPS and in the first nine months rose from 160,000 tons to 163,800 tons. Synthos reduced production of general polystyrene at Oswiecim in the first nine months this year from 42,500 tons to 40,300 tons in 2022, whilst expandable polystyrene increased from 58,100 to 58,400 tons.

Achieving profit targets from production this year has been highly challenging for Synthos in the face of rising energy costs and weaker demand. In the synthetic rubber division, the tight butadiene spread has led to reduced operating rates which should be reflected in fourth quarter data. Synthos has stated that it aims to reduce ESBR production until further notice, while production of solution-SBR and butadiene rubber will continue as planned. Synthos manufactures ESBR at all three of its production sites in Oswiecim, Kralupy nad Vltavou, and Schkopau. If the reduction in ESBR production is extended over a 12-month period at its three sites, it could equate to around a loss of 100,000 tpa.

Central European rubber trade 2022

In the first nine months in 2022 Poland exported a total of 230,684 tons of

synthetic rubber for a total cost of €462.755 million against 250,917 tons in the same period for €374.442

million. The largest category of synthetic rubber included the group of styrene-butadiene-styrene block co-polymers which amounted to 179,243 tons in January to September 2022.

From the Kralupy plant in the Czech Republic Synthos exported 147,825 tons of synthetic rubber in the first nine months for €315.633 million versus 155,589 tons in the same period in 2021 for €245.330 million. In the first three quarters in 2022 Synthos exported 104,261 tons of ESR from Oswiecim for a total value of €129.011 million and from Kralupy 61,838 tons for a total value of €91.684 million.

Butadiene imports into Central Europe from Russia showed no signs of sanctions impact in the first half of the year although the sanctions did not take effect until 10 July. The introduction of sanctions on butadiene rubber is creating a gap in the market and has encouraged Synthos to revive production at the idled plant at Schkopau which it acquired under the Trinseo acquisition.

Hungarian Imports of Synthetic Rubber (unit-kilo tons)		
	Jan-Sep 22	Jan-Sep 21
Total imports	87.242	108.741
From Russia	28.223	38.163
	Jan-Sep 22	Jan-Sep 21
Total imports of butadiene rubber	29.841	29.604
Total imports of HBR	10.863	16.51
	Jan-Sep 22	Jan-Sep 21
Imports of butadiene rubber from Russia	12.083	11.322
Imports of HBR rubber from Russia	9.378	13.841

butadiene rubber dropped to 22,849 tons in the first nine months of 2022 from 25,708 tons in 2021, with Russia supplying 9,731 tons.

Poland imported a total of 44,600 tons of butadiene rubber in the first three quarters in 2022, which was up from 33,690 tons in the same period in 2021. Imports from Russia increased in the first three quarters from supplied 13,855 tons in January to September last year to 18,497 tons, most of which was supplied in the first half of 2022.

Hungarian imports of butadiene rubber increased in the first half this year to 22,697 tons against 19,367 tons of which Russia supplied 9,226 tons. Czech imports of

The fall of imports into the Czech Republic corresponds with rise in exports of butadiene rubber from 53,877 tons in the first nine months in 2021 to 56,897 tons in the same period this year. Revenues from butadiene exports increased from €74.731 million to €115.769 million. The largest customer for Czech butadiene rubber is India which took 17,345 tons in the first nine months in 2022 for €35.068 million. The largest European consumer was Poland taking 11,321 tons for €23.037 million followed by Slovakia with 7,605 tons for €15.599 million.

In the first three quarters this year Hungary imported 10,862 tons of halogenated butyl rubber (HBR) of which Russia provided 86%. Nearly all of the Russian shipments to Hungary were delivered in the first seven months in 2022. Belgium was the second largest supplier, from ExxonMobil, and volumes are expected to increase from this source over the next few months.

Nokian new tyre project Romania

In order to replace divestment of the Russian tyre plant Nokian Tyres intends to invest in a new passenger car tyre plant to be constructed at Oradea in the North-West of Romania, near the Hungarian border. The annual capacity of the factory will be 6 million tyres. The total investment is estimated to be approximately €650 million. Construction is scheduled to begin in early 2023 and the first tyres are estimated to be produced in the second half of 2024. Commercial tyre production is expected to start in early 2025.

Polish Tyre Production (unit-kilo tons)		
	Jan-Sep 22	Jan-Sep 21
Car Tyres	225.2	226.3
Bus & truck Tyres	165.8	163.4
Tractor tyres	9.2	7.3
Others	22.7	27.4
Total	423.0	424.3

Nokian is committed to building a zero CO2 emission factory utilizing green energy produced near the site. Due to the war and the subsequent, tightening sanctions it was no longer feasible nor sustainable for Nokian Tyres to continue operations in Russia. Besides the greenfield investment at Oradea Nokian Tyres continues to increase

capacity at its factories in Finland and the US.

Grupa Azoty Financial Performance Jan-Sep 2022

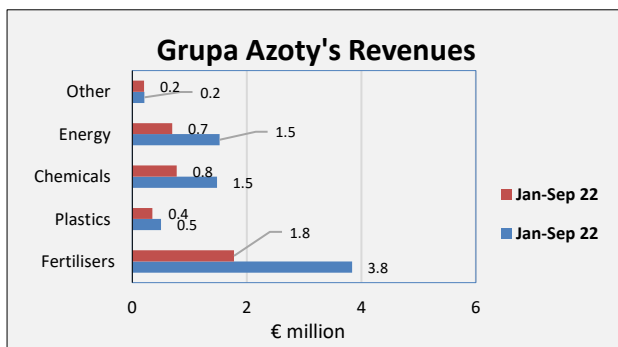
Polish Chemical Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Caustic Soda Liquid	307.9	258.8
Caustic Soda Solid	47.2	61.8
Caprolactam	107.1	120.9
Acetic Acid	1.8	3.9
Polystyrene	52.9	53.9
EPS	76.1	79.1
PVC	220.0	147.8
Synthetic Rubber	208.0	210.8
Ammonia (Gaseous)	1636.0	1943.0
Ammonia (Liquid)	76.8	80.1
Pesticides	51.6	51.8
Nitric Acid	1568.0	1827.0
Nitrogen Fertilisers	1367.0	1555.0
Phosphate Fertilisers	253.0	377.8
Potassium Fertilisers	247.0	265.0

Grupa Azoty Pulawy restarts melamine and caprolactam production

Grupa Azoty Puławy decided to resume the production of melamine on 27 October by launching the Melamine III and caprolactam installations. Due to high gas prices, the installations were shut down in August. The decline of prices since then has enabled production to resume but probably at reduced capacity levels. The maximum production capacity for melamine at Pulawy is 270 tons per day. Regarding other facilities, the company decided on 12 October to restart the nitrogen fertiliser production.

Grupa Azoty Q3 & full year results

The increase in gas prices and the related partial suspension of production affected Grupa Azoty's financial results in the third quarter, offsetting the strong results in the first two quarters. Despite huge rises in revenues for fertilisers, plastics chemicals due to gas and energy costs, the company ended the third quarter in the red.



During this period the production of fertilisers was temporarily reduced at Tarnow, Kędzierzyn Koźle and Puławy. The fourth main plant at Police worked normally as it produces compound fertilisers based on raw materials other than gas.

For the first three quarters Grupa Azoty generated consolidated sales revenues of zł 19,551 million (€4.254 billion) which is zł 9 billion (€1.92 billion) higher than in 2021. For the first three quarters the EBITDA margin amounted to 14.5%, the first

Grupa Azoty Financial Indicators (€ billion)		
	Jan-Sep 22	Jan-Sep 21
Revenue	4.170	2.285
Operating profit	0.490	0.107
Profit before tax	0.424	0.087
Net profit	0.342	0.059

half's strong margins counterbalanced by only 4.2% in the third quarter. Overall Azoty's net profit amounted to €342 million in January to September 2022 against €59 million in the same period last year.

The chemicals division recorded an increase in EBITDA in the first nine months despite the fact that operating costs exceeded revenues in the third quarter. Higher prices for

propylene persisted longer than derivative prices including 2-EH where prices fell 10% over the three-month period. 2-EH is a major product for Grupa Azoty Kędzierzyn which encountered a downturn in demand in the third quarter.

Grupa Azoty's Chemical Division (€ million)		
	Jan-Sep 22	Jan-Sep 21
Revenues	1479.7	778.0
Operating Costs	-1322.0	-731.0
EBITDA	172.1	47.6

Contract prices for propylene rose 19% in the third quarter compared with the same period in 2021 but were 16% lower relative to the second quarter of 2022. The short-term forecast is for propylene prices to trend downwards mainly due to the continuing low demand.

As regards propylene, supplies from Russia were fully replaced with supplies from alternative sources. As at the date of authorisation of these financial statements for issue, the sanctions did not have any impact on deliveries to the Group companies and no production constraints were identified. The bulk of the Group's purchases of propylene are made under annual contracts, with supplementary purchases made on the spot market.

Central European polyol & isocyanates

MOL's polyol project in Hungary

The polyol project at Tiszaujvaros was originally scheduled to start in mid-2021 but the pandemic slowed the progress down sharply which has been followed by the impact of the war in Ukraine. As matters stand, MOL aims to complete the 200,000 tpa polyol project in the first half of 2023. The completion will take place simultaneously as the propylene glycol and propylene oxide plants are finished. The project schedule overall is around 97% completed, and frequently the last part of such a large project can be the hardest.

Czech MDI imports (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
China	2.322	1.908
Belgium	9.122	9.583
Germany	11.759	11.404
Hungary	5.898	5.983
Netherlands	2.673	1.881
Others	0.917	3.011
Total	32.692	33.770

The polyol project for MOL represents a value chain extension. Around \$1.3 billion has been invested in the project where polyols provide a better return on capital than polypropylene, effectively €400-500 per ton in margins against €150. Central European consumption of polyols is estimated at 250,000 tpa constituting around 15% of total European demand.

Central European isocyanates, Jan-Sep 2022

MDI imports into the Czech Republic totalled 32,692 tons in the first nine months in 2022 against 33,770 tons in the same period in 2021. Total costs for MDI imports into the Czech Republic

dropped from €78.820 million in January to September 2021 to €73.362 million in the same period in 2022, with average prices dropping from €2.331 per ton to €2.244. TDI imports into the Czech Republic amounted to 5,688 tons in the first nine months this year for a total cost of €20.569 million.

Polish MDI Imports (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
Germany	80.603	94.909
Netherlands	45.163	40.024
Hungary	76.062	87.568
Belgium	60.170	52.062
Saudi Arabia	5.279	8.137
Others	25.152	23.967
Total	292.429	306.666
Ktons delivered	110.694	144.542
Av Price Per Ton	2.642	2.122

MDI imports into Poland totalled 110,694 tons in the first nine months in 2022 against 144,542 tons in the same period in 2021. Overall costs dropped from €306.666 million to €292.429 million, although average prices rose from €2122 per ton to €2642 in January to September 2022. Germany was the largest supplier to the Polish market followed by Hungary. Although MDI imports into Poland fell in the first nine months so did exports from Poland, dropping from 24,591 tons to 14,708 tons. Hungary exported 116,750 tons of MDI in the first half of 2022 against 115,341 tons January to June 2021, with average prices rising from €2207 per ton to €2598 per ton this year.

TDI imports into Poland amounted to 56,552 tons in the first nine months in 2022 against 59,764 tons in the same period in 2021.

Values in January to September 2022 amounted to €156.336 million, equating to €2768 per ton, against €137.184 million in the first nine months in 2021 when prices averaged €2295 per ton.

Polish TDI Imports		
Country	Jan-Sep 22	Jan-Jul 21
€ million	156.524	137.184
Ktons	56.552	59.764
Av Price	2.768	2.295

Hungarian TDI exports amounted to 170,282 tons in the first eight months of 2022 against 193,838 tons in the same period in 2021, whilst revenues from TDI shipments dropped from €465.924 million to €462.181 million. Average prices per ton rose to €2707 from €2404 in the first eight months in 2021.

PCC Rokita Jan-Sep 2022

Despite higher energy and raw material costs PCC Rokita increased its EBITDA in the first three quarters by 40% to zł 615 million (€131.4 million) and a rise of net profit by 64% to zł 388 million (€82.7 million). Although polyols and polyurethanes represent the largest division for PCC Rokita's production and sales, it has been the chloralkali division which has been the main driver of profitability this year. The positive results were mainly influenced by the rising prices of chloro-alkali, and above all of soda lye. The chlorine division recorded a rise in EBITDA of 349% to zł 442.8 (€94.6 million) in the first three quarters this year against the same period in 2021. The EBITDA profit margins for the chloralkali division amounted to 33.4% in the first three quarters, up from 14.3%.

PCC Rokita's divisional sales by volume (unit-kilo tons)		
Product Group	Jan-Sep 22	Jan-Sep 21
Polyurethanes	71.6	72.3
Chloralkalis	288.5	295.1
Chemical	20.2	21
PCC Rokita's divisional sales by value (€ million)		
Product Group	Jan-Sep 22	Jan-Sep 21
Polyurethanes	212.1	199.6
Chloralkalis	278.5	144.9
Chemical	41.7	30.2
PCC Rokita's divisional prices (€ per ton)		
Product Group	Jan-Sep 22	Jan-Sep 21
Polyurethanes	2.962	2.761
Chloralkalis	0.965	0.491
Chemical	2.064	1.438

September. Third quarter profitability dropped subsequently.

The EBITDA profit margins for the polyurethane division amounted to 13.4% in the first three quarters down from 29.8% in the same period in 2021. Net profits from the polyurethane sector dropped to zł 94.418 million (€20.1 million) in the first nine months from zł 179.919 last year. The polyol market is facing some uncertainty in the second half of 2022 over demand and high costs.

Costs of materials and energy accounted for 60.7% of all PCC Rokita's costs in January to September this year. The increase was mainly caused by higher costs for propylene oxide, ethylene oxide and benzene which have risen this year due to a range of external events, the most important of which includes Ukraine.

The group is constructing a new plant at Brzeg Dolny. This new plant is run by PCC BD, whose partners are PCC Rokita and PCC Exol. The new installation is to produce a wide range of ethoxylates and polyether polyols, which can be widely used in numerous industries. Products from this installation are to be characterized by lower emissions of volatile organic compounds, a shorter and low-waste production process, and some products will have a lower carbon footprint.

PCC Exol's divisional sales by volume (unit-kilo tons)		
Product Group	Jan-Sep 22	Jan-Sep 21
Surfactants for use in detergents and cosmetics	48.5	48.8
Surfactants for use in industry	25.9	25.3
PCC Exol's divisional sales by value (€ million)		
Product Group	Jan-Sep 22	Jan-Sep 21
Surfactants for use in detergents and cosmetics	85.3	49.9
Surfactants for use in industry	73.7	48.3
PCC Exol's divisional prices (€ per ton)		
Product Group	Jan-Sep 22	Jan-Sep 21
Surfactants for use in detergents and cosmetics	1.779	1.027
Surfactants for use in industry	2.845	1.906

both in terms of sales and generated profit. Physical sales totalled 75,400 tons in the first three quarters, 1,200 tons higher than in the same period in 2021. The installation for the production of oxyalkylates which was put into operation in the second half of 2021 helped increase sales volumes.

The company continues the increased sales of chlorobenzenes compared to recent years, part of the market diversification. This includes active sales of the product in the US due to the lease of a dedicated tank established on the East Coast in 2021. The company recorded an 11% higher sales volume compared to the same three quarters of 2021. The continued high demand from the industries in which monochlorobenzene is used remained strong.

The polyurethane segment by contrast recorded a fall of 52% in EBITDA in January to September this year to zł 135 million (€28.8 million). At the beginning of 2023 PCC Rokita was operating at full capacity and the first quarter was relatively successful. From the second quarter on, polyol prices began to drop significantly and only stopped falling in

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.

PCC Exol Jan-Sep 2022

The three quarters of 2022 were the best period in history for the Group,

Overall, for the first three quarters sales revenues for PCC Exol increased against the same period in 2021 by zł 327.9 million (€69.9 million) to a total of zł 902.7 million (€192.4 million). Part of the increase this year is attributed to supply limitations in Europe which are still linked to the economic effects from the pandemic. Moreover, in the third quarter in 2022, the supply of most surfactants on the European market significantly improved, which stabilised the market situation and inhibited further price increases.

The third quarter was also noticeable for a price correction in ethylene oxide which is the main raw material for PCC Exol. The company's production is not energy-intensive, and thus the company's expenses for the purchase of electricity in three quarters of 2022 accounted for approximately 1.3% of the total purchase of materials and raw materials. In the first three quarters in 2022, the PCC Exol Group achieved a record net profit of zł 100.4 million (€21.5 million), improving last year's result by zł 65.2 million (€13.9 million) over 2021 or by 185%.

PCC Exol is currently working on the construction of a new unit ethoxylate 2 (ETE-2) plant at Plock which includes the production of non-ionic surfactants (ethoxylates). The project is expected to be completed estimated approximate time of completion of the investment is mid-2024. After the completion of the investment, capacity at Plock will rise to 80,000 tpa.

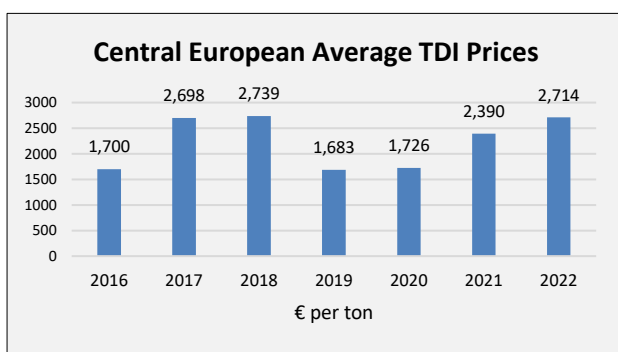
Chimcomplex Product Sales Jan-Sep 2022	
Product Group	Share of Turnover
Polyols	56%
Chloralkalis	33%
Oxo Alcohols	3%

Chimcomplex, Jan-Sep 2022

Chimcomplex reported a net profit of €182 million in the first nine months in 2022, twice as low as in the same period of 2021. Revenues increased 2.4% to 1.88 billion lei (€382.4 million) whilst costs increased by 23.7% to 1.67 billion lei (€339.4 million). Operating expenses increased on the background of higher purchase prices for raw materials and utilities during the period January-September 2022. Thus, costs outweighed sales revenues as a result of the increase in electricity and natural gas prices, resulting in a temporary closure on the Borzesti

Chimcomplex Financial Performance (€ million)		
	Jan-Sep 2022	Jan-Sep 2021
Revenues	381.4	345.3
Costs	339.4	275.7
Net Profit	165.7	282.7

industrial platform in August followed by some redundancies.



Chimcomplex continues to focus its activity on the polyol/polyethers and caustic soda sectors, which are the most profitable. Between January and September 2022, compared to the same period of last year, the share of caustic soda due to significantly higher prices.

The fixed assets of the company increased by 18.4% as a result of the acquisition by public auction of the assets of CET Govora from the industrial platform from Ramnicu Valcea, of the investments made mainly at the Polyol Special

plant.

Chimcomplex launched its new polyol plant at Ramnicu Valcea on 21 July 2022. The investment of €40 million, which is part of a wider investment project of €101 million, increases the company's production capacity to over 187,000 tpa. Other developments in the third quarter included the rehabilitations of the Electrolysis plant and through the acquisition of shares of the A6 Impex SA Dej company and of the company Sistemplast owned by UZUC SA.

Chimcomplex is 85.2% controlled by CRC Alchemy Holding, a vehicle owned by businessman Stefan Vuza, while the Romanian state, through the Authority for State Assets Management, holds almost 9% of the share capital. Chimcomplex is the only producer of polyurethane polyols in Romania and has oriented its development strategy towards technological efficiency, energy efficiency and green and sustainable chemistry.

Central European organic chemical trade

Polish Organic Chemical Trade		
Exports	Jan-Sep 22	Jan-Sep 21
Vol (kilo tons)	1273.5	1108.0
Value (€ million)	1750.8	1234.0
Imports	Jan-Sep 22	Jan-Sep 21
Vol (kilo tons)	2329.0	2320.9
Value (€ million)	3922.2	2947.4

Polish organic chemical trade Jan-Sep 2022

Imports of organic chemicals into Poland amounted to €3.922 billion in value in the first nine months in 2022 for 2.329 million tons of products. Export values rose to €1750.8 million in January to September for 1.274 million tons.

High energy prices have played a key role in driving up values this year. Imports of propylene and phenol from Russia have shown signs of decline since May, whilst methanol exports remain high

in Poland's new role as a regional conduit to other parts of Central Europe. Methanol imports totalled 704,968 tons in the first nine months in 2022 against 524,994 tons in the same period in 2021.

Phenol imports into Poland have risen sharply this year, amounting to 79,864 tons in the first nine months in 2022 versus 30,616 tons last year. Russia was one of the main suppliers of phenol this year in the first half of this year although volumes in May started to show signs of softening as EU sanctions were being introduced. In the first nine months phenol imports into Poland from Russia totalled 14,133 tons for a total value of €20.616 million which measured against 9,746 tons for the whole of 2021 for €10.732 million.

Ethylene oxide imports into Poland totalled 10,084 tons in January to September 2022 down from 21,517 tons in the same period in 2021. Poland stopped importing ethylene oxide from Russia in May this year.

For other organic chemical imports Poland took 34,432 tons of acetic acid in the first nine months in 2022 against 34,499 tons in the same period in 2021. The UK was the leading supplier, shipping 11,222 tons for €13.220 million.

Ethyl acetate imports dropped from 17,785 tons in the first nine months last year to 12,291 tons this year, with Belgium providing the largest share of

imports. The second largest supplier was Ukraine, providing 1,453 tons although most of the product was shipped in the first quarter.

Polish Organic Chemical Imports (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Acetic Acid	34.432	34.499
Acetone	5.447	4.728
Adipic Acid	8.710	6.668
Butadiene	85.381	96.008
DEG	20.422	21.172
DINP/DOP	17.116	15.678
Ethyl Acetate	12.291	17.785
Ethylbenzene	75.623	99.806
Ethylene Glycol	40.007	38.152
Ethylene Oxide	10.084	21.517
Isopropanol	8.148	7.840
Lysine	45.058	41.077
Maleic Anhydride	10.292	12.422
Melamine	21.160	18.232
Methanol	704.968	524.994
Paraxylene	34.150	64.316
Phenol	79.864	30.616
Phthalic Anhydride	24.427	28.818
Propylene	107.949	182.127
Propylene Glycol	15.518	18.181
Propylene Oxide	1.830	3.962
PTA	1.446	46.992
Styrene	74.646	82.307
TDI	55.764	61.972
Toluene	18.251	16.820
VAM	13.468	13.889

imports. The second largest supplier was Ukraine, providing 1,453 tons although most of the product was shipped in the first quarter.

Polish PTA Exports (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
Belarus	5.762	11.943
Germany	257.054	296.289
Lithuania	31.404	22.909
Switzerland	5.730	3.893
Turkey	5.984	0.000
Others	15.130	6.291
Total	321.064	341.325

Polish PTA trade Jan-Sep 2022

PTA exports from Poland amounted to 321,064 tons in the first nine months in 2022 against 341,325 tons in the same period in 2021. Average prices for Polish PTA exports in the first nine months amounted to €995 per ton. PKN Orlen reduced PTA production in May due to some technical issues which followed on from April where the company delivered up to 75% of the minimum contract volumes. Germany remained the main customer for Polish PTA, taking 257,054 tons in January to September 2022 against 296,289

tons in the same period in 2021. Lithuania was the second largest destination for PTA export shipments, taking 31,404 tons.

Central European methanol markets

Czech Methanol Imports (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
Germany	4.807	8.700
Norway	0.764	0.000
Russia	23.014	41.668
Poland	27.618	17.404
Others	1.031	1.400
Total	57.233	61.825

Central European methanol trade Jan-Sep 2022

Czech imports of methanol amounted to 57,233 tons in the first nine months against 61,825 tons in the same period in 2021. Russia accounted for 23,014 tons in the first nine months down from 41,668 tons last year, according to Czech statistics.

Prices per ton for methanol imports into the Czech Republic increased from €350 in the first nine months in 2021 to €486 in the same period in 2022.

Polish Methanol Imports (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
Azerbaijan	1.138	0.000
Belarus	0.044	2.620
Finland	50.816	58.013
Lithuania	0.856	7.011
Germany	77.491	64.210
Netherlands	0.650	25.739
Norway	16.787	18.497
Russia	554.087	337.587
Others	3.099	11.317
Total	704.968	524.994

Imports of methanol into Poland totalled 704,968 tons in the first nine months in 2022 against 524,994 tons in the same period in 2021. Russia increased exports from 337,587 tons to 554,087 tons whilst Finland shipped 50,816 tons against 58,013 tons in January to September July 2021. Germany increased exports to Poland in the first nine months to 77,491 tons from 64,210 tons in the previous year. Import prices averaged €375 per ton in the first nine months.

Total Polish exports to Central amounted to 124,536 tons in the third quarter which means that for the full three quarters in 2022 Polish methanol trade (including exports and imports) exceeded one million tons. Volumes are expected to continue until the end of the year and into the first week of January before sanctions would start to take effect. Other sources will have to be found to replace the inward flows of Russian methanol which may not be so profitable for Polish traders.

Poland Methanol Exports to Central Europe			
Country	Q1 22	Q2 22	Q3 22
Austria	20.033	19.163	18.748
Czech	19.521	20.590	18.625
Germany	27.483	29.955	33.461
Romania	3.522	9.585	20.269
Slovakia	6.507	18.577	13.425
Ukraine	0.253	4.492	6.715
Hungary	5.815	18.940	13.293
Others	2.528	0.486	3.763
Total	83.134	121.303	124.536

Exports of methanol from Poland amounted to 328,972 tons in the first nine months against 137,118 tons in January to September 2021. Revenues from Polish exports of methanol rose from €47.5 million in January to September 2021 to €141.0 million in the same period in 2022, with export prices averaging €429 per ton against €347 per ton last year.

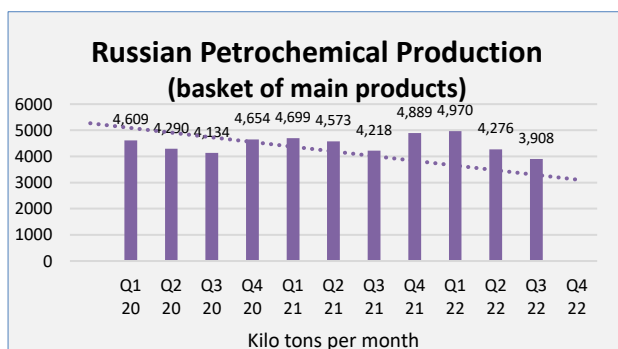
Hungarian Methanol Imports (unit-kilo tons)		
Country	Jan-Aug 22	Jan-Aug 21
Austria	1.238	2.549
Germany	8.626	1.094
Netherlands	6.233	1.776
Poland	12.805	0.309
Russia	10.763	35.555
Serbia	1.816	0.316
Slovakia	9.948	28.336
Others	1.381	14.504
Total	52.809	84.439

Export deliveries from Poland to Southeast Europe are expected to continue for the rest of this year, or as long as the Russian occupation of Ukraine prevents the railways from restarting. Polish exports to Ukraine totalled only 253 tons in the first quarter but the second quarter saw 4,492 tons shipped and then 6,715 tons in the third quarter.

Methanol imports into Hungary dropped from 84,439 tons in the first eight months in 2021 to 52,809 tons in the same period this year. Imports from Russia dropped from 35,555 tons to 10,763 tons and from Slovakia from 28,336 tons to 9,948 tons. Last year Serbia provided

13,947 tons from the Kikinda plant in the first eight months, but the plant has not operated this year. Thus Hungary has imported from other sources including the Netherlands, Germany and Poland.

RUSSIA



Russian chemical production Jan-Sep 2022

Quarterly production of mainstream petrochemical in Russia fell to 3.9 million tons in the three months from July to September 2022 against 4.2 million tons in the same quarter in 2021 and 4.1 million tons in 2020. Third quarter production volumes in Russia are generally the lowest of the four quarters due to maintenance schedules, but this year output has been affected by the additional problem of sanctions.

By Russian petrochemical producers having to adapt to sanctions imposed by the EU, US and other western oriented countries, it almost inevitable that some impact on production will be felt. The eighth package of EU sanctions may turn out to drive production volumes much lower although the impact of these measures is not expected until the second quarter in 2023. Forecasting though does not take into account the rapid changes in market dynamics where new customers and new supply chains are developing. SIBUR for instance states that China is the group's largest export destination and has replaced a lot of its European trade already. Even though SIBUR is a Kremlin backed group and is unlikely to give the full picture, it does reflect the underlying movements taking place for Russian companies and Russian products.

Russian Petrochemical Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Ethylene	3,275.4	3,303.8
Propylene	2,148.5	2,276.0
Benzene	881.0	953.1
Styrene	530.4	532.6
Phenol	175.9	195.9

Russian petrochemical production Jan-Sep 2022

In January-September 2022, Russian ethylene production dropped slightly from 3.304 million tons in the period January to September 2021 to 3.275 million tons in the same period in 2022. Propylene production dropped from 2.276 million tons to 2.149 million tons and benzene fell from 953,100 tons to 881,000 tons.

At the same time, in some segments of the petrochemical industry there has been a positive trend. The production of polyacrylates (used for the production of plexiglass, paints and varnishes) increased by 20.5%, due to the need to replace imported acrylic polymers. Methanol production increased in the first nine months largely due to the addition of new capacity by Shchekinoazot in 2021. However, methanol comes under EU sanctions from 8 January 2023 and production volumes are expected to drop.

Russian Polymer Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Plastics in Bulk	7,760.0	8,191.0
Polyethylene	2,579.0	2,606.0
Polystyrene	431.4	404.3
PVC	764.3	746.8
Polyamide	127.5	148.3
Synthetic Rubber	1,142.0	1,260.0
Synthetic Fibres	141.3	150.2

Russian polymer production Jan-Sep 2022

In the first nine months in 2022 Russian polymer production declined by 3.2% over the same period in 2021, dropping to 7.760 million tons. Whilst the decline has thus far been only marginal, it provides a shift in trend over the past decade when aggregate numbers increased year on year. Polyethylene production totalled 2.579 million tons in the first nine months in 2022 versus 2.606 million tons in 2021. Russian polypropylene production totalled 1.457 million tons in the first three quarters in 2022 against 1.537 million tons.

Whilst falls in polyolefins were recorded polystyrene production in Russia rose from 404,300 tons in the first nine months last year to 431,400 tons in January to September 2022. Furthermore, the production of PVC increased by 3.3% to 764,300 tons.

Synthetic rubber production fell by around 10% in the first nine months 1.260 million tons in January to September 2022 to 1.142 million tons. Polyamide production dropped by 12.3% in the first three

quarters, falling from 148,300 tons to 127,500 tons. The production of polyamide fell probably due to the reduction of demand from the automotive industry which has affected a number of polymers.

Ammonia production and the grain deal

Russian ammonia production has seen the largest fall this year dropping from 14.9 million tons in the first nine months last year to 12.7 million tons this year. This was due to mainly the lack of shipments through the Togliatti-Odesa pipeline. This pipeline could now be re-opened as part of the deal allowing Ukrainian grain ships to leave port and deliver cargo.

Russian Chemical Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Caustic Soda	966.0	959.1
Soda Ash	2,599.0	2,528.0
Ammonia	12,700.0	14,900.0
Nitrogen Fertilisers	8,785.0	8,397.0
Phosphate Fertilisers	3,182.0	3,145.0
Potash Fertilisers	5,654.0	8,031.0

The ammonia pipeline Togliatti-Odesa was built in the late 1970s for the transportation of Russian ammonia for export. The capacity for ammonia transportation is 2.52 million tons per annum, of which 2.12 million tons is accounted for by Russian companies, and the remaining 400,000 tons was originally for Stirol at Gorlovka which has since suspended production activity. The total length of the ammonia is 2,420 kilometres, including 1,020 kilometres inside Ukraine which appears undamaged from the consequences of the war.

EU Sanctions on Chemical Products by HS Code	
2901 24	Butadiene and isoprene
2902 11	Cyclohexane
2902 30	Toluene
2902 41	Orthoxylene
2902 43	Paraxylene
2902 50	Styrene
2903 11	Methyl chloride and ethyl chloride
2903 12	Methylene chloride
2903 21	VCM
2903 23	Tetrachloroethylene
2905.11	Methanol
2905 13	N-Butanol
2905 16	2-Ethylhexanol
2907 11	Phenol and its salts
2907 13	Octylphenol, nonylphenol, etc
2909 41	Diethylene glycol
2910 10	Ethylene oxide
2910 20	Propylene oxide
2912 60	Paraformaldehyde
2914 11	Acetone
2914 61	Anthraquinone
2916 12	Esters of acrylic acid
2916 13	Methacrylic acid and its salts
2916 14	Esters of methacrylic acid
2917 33	DINP or didecyl orthophthalates
2921 22	Hexamethylenediamine
2921 41	Aniline
2922 11	Monoethanolamine
2933 71	Caprolactam

Russian foreign trade Jan-Sep 2022

A list of commodity and semi-commodity chemical products are listed opposite where EU sanctions already apply or will do from 8 January next year. For many of these product's sanctions do not have much impact on Russian producers in terms of dealing with Western markets. The products most affected include methanol, paraxylene, styrene, phenol and acetone. In addition to EU sanctions Japan introduced bans on acetylene, acetone, chlorine, ethylene, ethylene glycol, methanol, and ethanol.

Regarding the impact of sanctions on imported speciality chemicals and catalysts, there is some understanding that it will need at least several years to replace European supplies. Where supplies have been thus far replaced from regions such as Asia, Russian companies have found themselves paying higher prices than previously from Europe. In addition, longer distances mean higher logistical costs and extended delivery times.

Japanese sanctions on Russian chemical products

Although chemical trade between Russia and Japan is relatively small, Japan introduced sanctions in early October on 73 chemical substances and pieces of equipment. The group of prohibited substances includes acetylene, acetone, benzene aldehyde, chlorine, ethylene glycol, sodium hypochlorite, methanol, ethanol, dichloromethane, trinitrophenol, etc.

Technology imports from Japan are more important than chemical trade and the list of prohibited devices includes chemical reactors, heat exchangers, rectification columns, etc. Previously Japanese bans were introduced on exports to Russia of high-tech equipment for oil refining, solar panels for hydrogen fuel and reproducible types of energy, etc.

Russian petrochemical markets

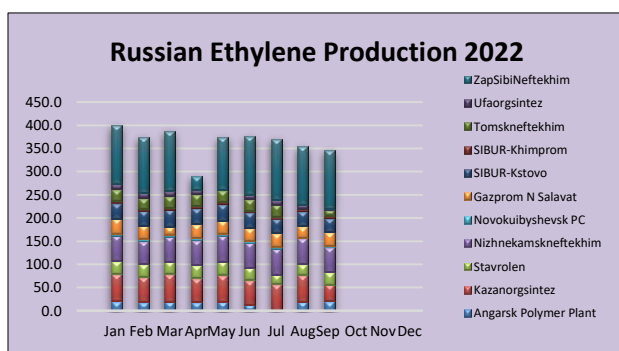
Russian Ethylene Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Angarsk Polymer Plant	151.9	149.5
Kazanorgsintez	480.8	425.4
Stavrolen	239.8	260.7
Nizhnekamskneftekhim	489.6	460.2
Novokuibyshevsk Petrochemical	30.5	34.1
Gazprom n Salavat	251.0	219.9
SIBUR-Kstovo	299.6	306.3
SIBUR-Khimprom	41.1	39.7
Tomskneftekhim	189.2	218.1
Ufaorgsintez	70.1	65.1
ZapSibNeftekhim	1031.6	1124.8
Total	3275.3	3303.8

million tpa. As a result, SIBUR now controls around 70% of Russian ethylene capacity.

Russian ethylene production, Jan-Sep 2022

Russian ethylene production totalled 3.275 million tons in the first nine months in 2022 against 3.304 million tons in the same period in 2021. Having increased production in the first quarter this year, output volumes have dropped slightly each month from May to September.

Russian ethylene capacity currently amounts to 4.77 million tpa. The ZapSibNeftekhim complex at Tobolsk, commissioned in 2019 by SIBUR, is capable of producing 1.5 million tpa of ethylene and by itself increased Russian capacity by almost a third. In the second half of 2021, SIBUR acquired the assets of the TAIF Group which includes Nizhnekamskneftekhim and Kazanorgsintez and total combined capacity of 1.24



Regarding producers ZapSibNeftekhim at Tobolsk produced 1.032 million tons in January to September 2022, down from 1.125 million tons from January to September 2021. Nizhnekamskneftekhim produced 489,600 tons of ethylene in the first nine months in 2022 against 460,200 tons in 2021, whilst Kazanorgsintez increased from 425,400 tons to 480,800 tons.

Other important ethylene producers included SIBUR-Kstovo which produced 306,300 tons versus 299,600 tons. In Bashkortostan Gazprom neftkhim Salavat produced 251,000 against 219,900 tons, whilst Ufaorgsintez increased production from 65,100 tons to 70,100 tons. Stavrolen at Budyennovsk reduced ethylene production in the first nine months to 239,800 tons against 260,700 tons in 2021.

neftkhim Salavat produced 251,000 against 219,900 tons, whilst Ufaorgsintez increased production from 65,100 tons to 70,100 tons. Stavrolen at Budyennovsk reduced ethylene production in the first nine months to 239,800 tons against 260,700 tons in 2021.

Russian Propylene Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Angarsk Polymer Plant	83.3	82.7
Kazanorgsintez	38.9	35.2
Lukoil-NNOS	222.1	183.4
Stavrolen	114.0	104.2
Nizhnekamskneftekhim	240.3	227.9
Novokuibyshevsk	20.8	49.6
Omsk Kaucuk	40.2	24.7
Polyom	141.5	148.7
Gazprom n Salavat	109.0	84.1
SIBUR Kstovo	129.9	133.2
SIBUR-Khimprom	60.3	43.7
Tomskneftekhim	98.3	116.4
SIBUR Tobolsk	69.3	3.0
Ufaorgsintez	115.7	126.5
ZapSibNeftekhim	659.5	912.6
Total	2143.3	2276.0

2022 against 227,900 tons in 2021 whilst Kazanorgsintez increased production 35,200 tons to 38,900 tons.

Feedstock costs for Russian petrochemical producers have risen this year, both for naphtha and LPGs. SIBUR purchases around 1.3 million tpa of naphtha for Nizhnekamskneftekhim but has faced price issues with the regional refinery TAIF-NK.

Russian propylene production, sales and exports, Jan-Sep 2022

Russian propylene production amounted to 2.144 million tons in the first nine months in 2022 against 2.276 million tons in the same period in 2021. The ZapSibNeftekhim and SIBUR Tobolsk plants reduced production from 915,600 tons in the first nine months in 2021 to 659,500 tons.

In Tatarstan Nizhnekamskneftekhim produced 240,300 tons of propylene in the first nine months in

In Bashkortostan Gazprom neftekhim Salavat produced 109,000 tons of propylene in the first nine months in 2022 versus 84,100 tons, whilst Ufaorgsintez reduced production from 126,500 tons to 115,700 tons. In the Nizhny Novgorod region SIBUR-Kstovo reduced production of propylene from 133,200 tons to 129,900 tons. SIBUR-Kstovo sells most of its propylene on the domestic market in addition to exports. Lukoil-NNOS at Kstovo increased production from 183,400 tons to 222,100 tons.

Russian Propylene Exports (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Lukoil-NNOS	57.4	66.6
SIBUR-Kstovo	10.6	14.4
Angarsk Polymer Plant	11.7	4.2
Stavrolen	18.7	26.3
Total	98.4	111.4

Russian propylene exports & sales Jan-Sep 22

Propylene exports from Russia amounted to 98,400 tons in the first nine months in 2022 against 111,400 tons in the same period 2021. Lukoil-NNOS reduced export shipments from 66,600 tons to 57,400 tons whilst SIBUR-Kstovo increased shipments from 14,400 tons to 10,600 tons.

Russian Propylene Domestic Sales (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Angarsk Polymer Plant	17.6	26.7
SIBUR-Kstovo	103.4	97.2
Akrilat	13.2	1.3
LUKOIL-NNOS	134.8	108.2
Stavrolen	18.9	3.6
Others	12.0	0.4
Total	300.8	238.7

Russian sales of propylene on the domestic merchant market amounted to 298,300 tons in the first nine months in 2022 against 247,700 tons in the same period last year.

The largest propylene supplier to the domestic market was Lukoil-NNOS, shipping 134,800 tons against 108,200 tons in January to September 2021 followed by SIBUR-Kstovo which increased from 97,200 tons to 103,400 tons.

Russian Propylene Domestic Purchases (unit-kilo tons)		
Consumer	Jan-Sep 22	Jan-Sep 21
Saratovorgsintez	123.8	99.5
Volzhskiy Orgsintez	8.7	8.6
Akrilat	18.3	2.9
SIBUR-Khimprom	30.1	38.7
Omsk-Kaucuk	5.0	11.4
Tomskneftekhim	2.2	3.3
ZapSibNeftekhim	86.8	44.2
Moscow Refinery	1.7	8.3
Nizhnekamskneftekhim	1.6	3.0
Ufaorgsintez	7.5	7.4
Khimprom Kemerovo	5.4	4.8
Plant of Synthetic Alcohol	3.5	8.2
Others	0.0	3.477
Total	298.3	247.7

Due to lower production ZapSibNeftekhim increased merchant propylene purchases, mostly from other SIBUR plants, from 44,200 tons in January to September 2021 to 86,800 tons in the same period this year. Saratovorgsintez increased purchases of merchant propylene for acrylonitrile production from 99,500 tons to 123,800 tons. Regarding other consumers, SIBUR-Khimprom at Perm reduced purchases from 38,700 tons to 30,100 tons.

Russian styrene production, sales and exports, Jan-Sep 2022

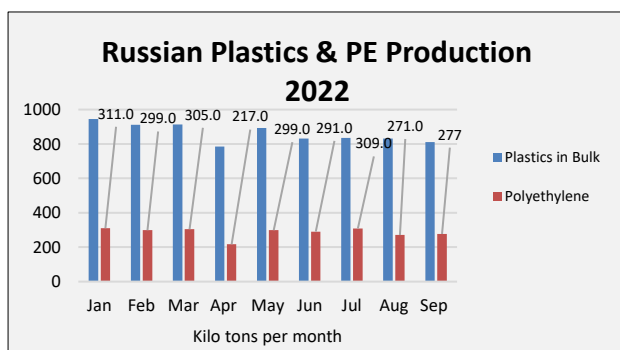
Russian styrene production fell from 532,600 tons in the first nine months in 2021 to 530,400 tons in January to September 2022. Nizhnekamskneftekhim reduced production from 232,900 tons to 227,900 tons where most of the styrene is used internally for polystyrene and synthetic rubber output. Gazprom neftekhim Salavat increased production from 126,500 tons to 133,700 tons.

Russian Styrene Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Nizhnekamskneftekhim	227.9	232.9
Angarsk Polymer Plant	25.7	29.3
SIBUR-Khimprom	109.8	94.1
Gazprom n Salavat	133.7	126.5
Plastik, Uzlovaya	33.4	49.8
Total	530.4	532.6

Russian styrene exports amounted to 51,500 tons in the first nine months in 2022 against 59,000 tons in the same period in 2021. Gazprom neftekhim Salavat reduced exports from 55,100 tons to 47,100 tons in January to September 2022 whilst SIBUR-Khimprom increased export shipments from 600 tons to 6,800 tons. Styrene exports from Russia increased from 59,000 tons in January to September 2021 to 59,800 in the same period in 2022. Domestic merchant sales of styrene dropped slightly from 91,500 tons in the first

nine months last year to 80,800 tons in 2022. Demand for styrene was affected by lower synthetic rubber production, although polystyrene production has increased slightly.

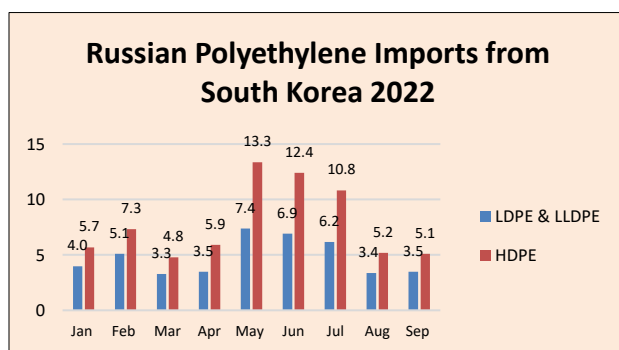
Russian bulk polymers

**Russian polyethylene production and trade Jan-Sep 2022**

Russian polyethylene production amounted to 2.031 million tons in the first three quarters in 2022 against 2.048 million tons in the same period in 2021. Production was slightly lower due mainly to the extended shutdown at ZapSibNeftekhim and tended to follow ethylene trends. Other recent polyethylene shutdowns include Gazprom neftekhim Salavat which started maintenance at the LDPE plant at the start of August and ran to the end of September.



Whilst exports to Europe were strong in the first half of 2022, applied sanctions helped reduce shipments in the third quarter. At the same time Russian exports to China increased in the third quarter, particularly HDPE where shipments totalled 86,200 tons in the third quarter against 75,900 tons for the first half of 2022.



Imports of higher grades of HDPE from South Korea dropped in the third quarter after rising in the first half of 2022. Some Russian processors claim that South Korea is following EU sanctions on polymer trade which affects some polyethylene grades.

Russian polyethylene pipe grade shortages

Pipe grade polyethylene shortages continue to affect processing levels in Russia. The prioritisation of orders for the eastern parts of Ukraine which Russia is currently occupying is a major factor explaining the shortages combined with the effects from sanctions. The drive to introduce Russian gas supply to the captured regions of Donetsk, Lugansk, Mariupol, Kherson and Zaporizhzhia has pushed those traditional processors concentrating on Russia's legally recognised territory to the back of the queue.

SIBUR has explained that black pipe grade polyethylene is limited only to companies that are fulfilling state orders and thus other consumers may find it difficult to find supplies. SIBUR has increased its production of raw materials by 40%, but such a step will still not help to cover the rush demand. At the same time the production of pipe polyethylene grade has been stopped at Kazanorgsintez.

In order to try and circumvent the problem of raw materials, some processors have begun to produce a black pipe brand which may increase the risks of accidents. Those companies certified in the Gazprom system

regions of Donetsk, Lugansk, Mariupol, Kherson and Zaporizhzhia has pushed those traditional processors

Kazanorgsintez halts production of PE100

Until recently, pipe manufacturers used polyethylene produced by Kazanorgsintez but after the company was bought by SIBUR in 2021 it was suspended. The replacement from ZapSibNeftekhim at Tobolsk differs in characteristics from Kazan.

Processors state that it is possible to import raw materials from friendly countries, but a long procedure for certification and laboratory tests is necessary which can take about nine months. One processor Truboplast-A at Barnaul previously purchased PE100 from Kazanorgsintez but has not had a single ton from Tatarstan this year. Previously, the Barnaul plant used Korean raw materials, but these product grades are affected by it is now impossible to bring plastic chips from Korea because of the sanctions. Due to SIBUR's start-up problems at Tobolsk Truboplast-A is only running at around 25% of capacity at present. It is feared that it could several years before SIBUR perfects its production of pipe grade polyethylene.

are not faced by difficulty but this amounts to only nine in total. The list of Gazprom pipe manufacturers includes the Moscow groups Polyplastik and Salavatstroytek, and two Tatarstan manufacturers including Techstroy which produces more than 55,000 tpa. The monthly demand for raw materials for Techstroy is about 4-5,000 tons per month, but even this company has encountered difficulties in supplies from SIBUR. Work is underway with alternative suppliers of certified raw materials from Iran and Azerbaijan, but these products can take up to nine months before receiving state approval.

In Russia, pipe polyethylene is produced only now by ZapSibNeftekhim at Tobolsk. Similar production at Kazanorgsintez was stopped earlier in 2022 as part of SIBUR's optimisation of the brand portfolio. One of the reasons for the stoppage at Kazanorgsintez is the lack of a catalyst that was previously imported from so-called unfriendly countries.

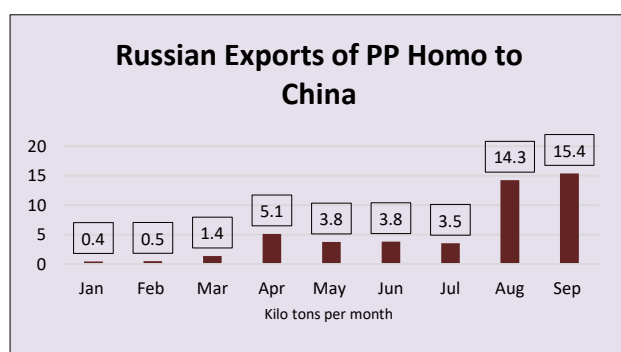
Russian PE Pipe Market		
	Jan-Sep 22	Jan-Sep 21
Pipe Grade PE Consumption	550,000 tons	420,000 tons
Share of Black PE	63%	55%

The total consumption of pipe grades of PE for nine months of 2022 increased by 28% compared to the same period in 2021. At the same time, SIBUR's supplies exceeded the growth rate of the market and increased by 46%. As for black PE brands, in 2021 the market share was no more than 55% of all pipe brands (this is 420,000 tons). It is expected that this year the market will grow to 550,000 tons and black PE will occupy about 63%.

To meet the sharply increased demand from pipe manufacturers for infrastructure projects in the field of gas and water supply, SIBUR increased the production of black pipe grade polyethylene in August. SIBUR currently produces up to 30,000 tons per month of PE100 grade, although this not sufficient to meet full demand.

Demand for ultra-high molecular weight polyethylene for war in Ukraine

Investments are being considered at Kazanorgsintez in a project to produce ultra-high molecular weight polyethylene (UHMWPE) and threads. These advanced materials are required for body armour and army helmets and project costs have been estimated at around 1.42 billion roubles (\$23.3 million). One of the uncertain factors against the project is the length of the war and whether it helps Russia in the short-term.



Russian exports of homo grade polypropylene to China have increased this year as markets in Europe become harder to access. At the same time imports of copolymers have become more difficult for Russian consumers. Imports from South Korea increased in the middle part of the year but then declined as South Korean sellers try to avoid secondary sanctions.

Russian polypropylene trade

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Russian Polypropylene Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Ufaorgsintez	90.2	88.3
Stavrolen	74.7	90.3
Neftekhimya	104.4	111.0
Nizhnekamskneftekhim	187.0	165.1
Polyom	141.9	154.8
Tomskneftekhim	101.4	114.5
ZapSibNeftekhim	758.0	813.4
Total	1457.6	1537.4

Russian polypropylene production totalled 1.457 million tons in the first three quarters in 2022 against 1.537 million tons. The reduction in output was due to a number of scheduled production shutdowns. ZapSibNeftekhim reduced production in January to September 2021 of 813,400 tons to 758,000 tons in the same period this year, whilst Nizhnekamskneftekhim increased production from 165,100 tons to 187,000 tons. Polyom reduced production to 141,900 tons from 154,800 tons whilst Tomskneftekhim reduced production from 114,500 tons to 101,400 tons. Other companies reporting reductions included Stavrolen, falling from 90,300 tons to 74,700 tons and Neftekhimya at the Moscow refinery which fell from 111,000 tons to 104,400 tons.

Russian polypropylene production Jan-Sep 2022

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Paraxylene-PTA-PET

Russian Paraxylene Production 2022 (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Gazprom Neft	60.8	79.3
Kirishinefteorgsintez	34.4	49.5
Ufaneftekhim	83.1	72.0
Total	178.3	200.8

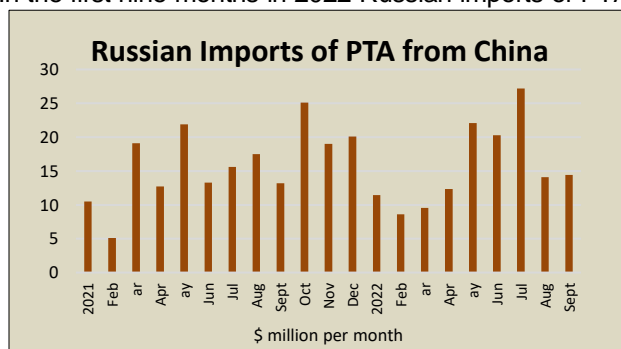
Russian paraxylene production Jan-Sep 2022

Russian paraxylene production totalled 178,300 tons in the first nine months of 2022 against 200,800 tons in the same period in 2021. Sanctions may have some effect on production volumes of paraxylene, particularly Kirishinefteorgsintez, but probably not affect the PTA chain significantly in the short term. In the first nine months Kirishinefteorgsintez reduced paraxylene production from 49,500 tons in 2021 to 34,400 tons whilst Gazprom Neft reduced volumes from 79,300 tons to 60,800 tons. Ufaneftekhim, which is the main paraxylene supplier to Polief, produced 83,100 tons in January to September 2022 versus 72,000 tons in the same period in 2021.

Paraxylene was included on the list of EU sanctions, published on 8 April, although other products in the PX-PET chain have not been included in the official embargo. All of the paraxylene from Russia until now has been exported to Finland and Belarus, but Russian refineries have to find other markets or reduce utilisation rates. China is a huge importer of paraxylene, but logistics represents an issue for Russian exporters. Gazprom Neft at Omsk Is the only refiner that could export paraxylene at profit, assuming it could be shipped on the Trans-Siberian railway to the Russian Far East ports.

PTA deliveries from China to Kaliningrad

In the first nine months in 2022 Russian imports of PTA from China totalled \$140.0 million versus \$129.2 million in the same period in 2021. Volumes have been lower this year due to the problems associated with transportation.



At the start of August this year TransContainer launched its first train from China to Kaliningrad through the Dostyk-Alashankou border crossing. The new service is focused on the transportation of PTA for PET production at Kaliningrad. As part of the first shipment, TransContainer provided its own equipment and organised the transportation of 96 twenty-foot containers from

Korla through the territory of Kazakhstan, Russia, Belarus and Lithuania. The delivery time from the Dostyk-Alashankou border crossing to the destination in Kaliningrad is eight days. Deliveries in October are reported to reach record levels.

EcoLine-VtorPlast polymer waste processing Moscow

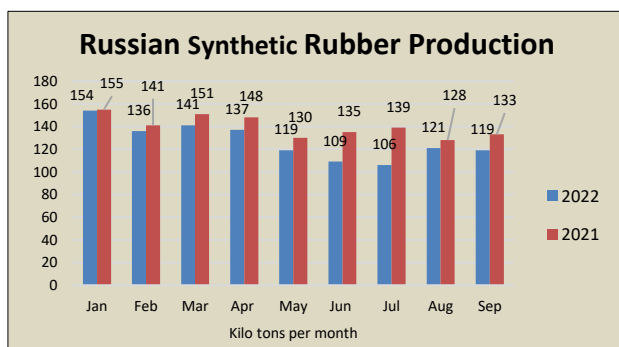
The EcoLine-Vtorplast plant in the Moscow region is close to start up and will become the largest polymer processing plant in Russia. The capacity is 60,000 tpa of polymer waste, leading to the production of 120,000 tpa of plastic containers with the addition of secondary granules. The company will be engaged in the processing of PET, polypropylene, HDPE and LDPE. The launch of waste processing and container production is scheduled for the summer of 2023.

SIBUR-recycling materials in the production of PET

By early 2023 SIBUR hopes that it will be possible to use recycled polymer packaging from PET in the company's processes. This method implies the "splitting" of polymers and allows the use of polymer raw materials repeatedly. All tests have confirmed that Vivilen rPET in its technical and operational characteristics is not inferior to the primary polymer, meets the regulatory requirements of food safety and is ready for use in the production of beverage and food packaging.

SIBUR has concluded an agreement with recycling group REO whereby starting in the third quarter of 2024, REO will supply up to 10,000 tpa of flex for Polief. To fulfill its obligations under the contract, REO is undertaking an investment project for the production of PET flex from used food packaging. It is envisaged that REO will purchase bottles on sorting, send them for recycling and sell the resulting PET flex to SIBUR.

Synthetic rubber

**Russian synthetic rubber production**

Synthetic rubber production in Russia totalled 1.142 million tons in the first three quarters in 2022 against 1.260 million tons in the same period in 2021. Production is expected to remain under the monthly 2021 levels for the rest of 2022.

Production of rubber this year has been affected to some extent by lower manufacturing volumes of tyres which meant that consumption in this sector dropped from 317,100 tons in the first three quarters in 2021 to 280,700 tons in the same

period this year.

Regarding feedstocks Russian butadiene production totalled 152,900 tons in the third quarter after the fall in the second quarter to 144,900 tons. ZapSibNeftekhim reduced production from 80,600 tons in the first quarter to 63,000 tons in the second and then 68,000 tons in the third, whilst Nizhnekamskneftekhim reduced production to 61,500 tons to 59,900 tons.

Russian Butadiene Production (unit-kilo tons)			
Producer	Q1 22	Q2 22	Q3 22
ZapSibNeftekhim	80.6	63.0	68.0
Nizhnekamskneftekhim	61.5	50.7	59.9
Togliattikaucuk	12.6	14.1	10.5
Sterlitamak Petrochemical Plant	8.7	6.9	4.4
Omsk Kaucuk	8.6	10.2	10.2
Total	172.0	144.9	152.9

Butadiene rubber, butyl rubber and halogenated butyl rubber are all products affected directly by sanctions, whilst isoprene rubber has thus far been excluded. The main problem facing isoprene rubber exports from Nizhnekamskneftekhim is logistics and the shipment of deliveries to European customers. Problems with alternative exports rest mainly on logistics. Even in cases where China is ready to buy, Russian producers cannot ship due to freight transportation limitations.

Tatneft-Nokian

Tatneft is trying to buy Nokian's tyre assets in Russia after the Finnish company announced earlier in 2022 that it was leaving the Russian market due to the invasion of Ukraine. Nokian Tyres at Vsevolozhsk is the largest tyre plant in Russia (operating since 2005) and the most modern tyre production in Europe. Nokian has been looking for a buyer since the summer. Bridgestone is also looking for a buyer for its Ulyanovsk

Russian Tyre Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Car Tyres	218.9	267.3
Lorry tyres	34.7	41.2
Agricultural tyres	27.1	8.7
Total	280.7	317.1

tyre plant having withdrawn from the Russian market.

complicating problem of sanctions which forced the company into selling the assets. Bridgestone has stated that a significant part of the components and raw materials had already been localised in Russia before the announcement of the suspension of production, but some of the materials needed for the production of tyres at the Bridgestone plant in Ulyanovsk were supplied from other countries.

The only Western tyre manufacturers still operating in Russia include Pirelli and Continental. Pirelli is still involved at the Kirov and Voronezh plants, as the share of Russian business in the group business amounts to around 10%. Continental at Kaluga (4 million pieces per annum) suspended production in March but then restarted in August. Traditionally, tyre manufacturers in Russia depend on foreign raw materials, as there are about 60 different materials in the tyre formulation. Around half of the raw materials are not produced in Russia, particularly natural rubber although this can be replaced by isoprene rubber. Product areas which are hard to replace include materials for vulcanisation accelerators and inhibitors. Other products in short supply include the production of cord polyethylene terephthalate, which has previously imported, but could potentially be established at SIBUR-PETF at Tver and Senezh at Solnechnogorsk.

Methanol

Russian Methanol Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Shchekinoazot	1142.2	727.3
Gazprom Methanol	530.4	687.8
Metafrax Chemicals	854.0	875.7
Akron	71.5	80.8
Azot Novomoskovsk	170.5	192.0
Angarsk Petrochemical	21.4	22.5
Azot Nevinnomyssk	85.7	95.0
Tomet	372.4	465.8
Ammoni	74.7	88.0
Totals	3322.8	3235.0

Russian methanol production Jan-Sep 2022

Russia produced 3.323 million tons of methanol in the first nine months in 2022 against 3.235 million tons in the same period in 2021. The rise in production is due almost exclusively to the increases at two producers Shchekinoazot and Tomet. For other plants, the picture is one of stability or declines. Metafrax reduced production from 875,700 tons to 854,000 tons, due to extended maintenance in mid-2022, and Gazprom Methanol reduced production from 687,800 tons to 530,400 tons where exports have dropped.

Tomet produced 372,400 tons of methanol in the first nine months in 2022 against 465,800 tons in the same period in 2021. Production for Tomet was higher in the first half of the year due to both units operating for most of this period but declined sharply in the third quarter when only 37,523 tons were produced from July to September.

Russian Methanol Balance (unit-kilo tons)		
	Jan-Sep 22	Jan-Sep 21
Production	3322.8	3234.9
Exports	1581.5	1397.1
Domestic	1204.8	1213.6
Market Balance	536.4	624.1

Shchekinoazot produced 1.142 million tons in the first nine months in 2022 against 727,300 tons in January to September 2021, following the start-up of the company's third methanol unit. More than two thirds of production was sent for export by Shchekinoazot, whilst a relative increase

in domestic merchant sales from Shchekino in the Tula Oblast added pressure to a quite large but fairly stagnant domestic market. Thus, the impact of Shchekinoazot's third plant has made it more difficult for some of the other producers which have reduced utilisation rates as a result. The other producer In the Tula Oblast, Azot at Novomoskovsk, reduced production from 192,000 tons to 170,500 tons in the first three quarter this year. Elsewhere Ammoni in Tatarstan reduced methanol production from 88,000 tons in the first nine months in 2021 to 74,700 tons in 2022. Regarding methanol storage, total inventory amounted to 121,100 tons at the start of September against 135,600 tons at the start of August.

Russian methanol exports & market overview Jan-Sep 2022

Despite the logistical difficulties in shipping methanol to foreign markets, Russian exports increased by 45.6% in the first nine months compared to the same period last year. Methanol deliveries by rail to Russian domestic consumers in September amounted to 106,900 tons (16% lower than in August).

Russian Methanol Exports by Producer (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Azot Nevinnomyssk	3.4	5.1
Azot Novomoskovsk	62.9	68.8
Akron	4.9	6.4
Metafrax Chemicals	330.6	293.7
Gazprom Methanol	211.0	349.8
Tomet	120.1	165.4
Shchekinoazot	847.0	508.0
Ammoni	1.5	0.0
Total	1581.3	1397.1

In September Russian producers shipped 187,100 tons, including 137,800 tons to EU countries measured against 103,700 tons in the same month in 2021. The two countries Finland (88,900 tons) and Poland (42,000 tons) accounted for 94.9% of deliveries in the EU in January to September 2022.

In terms of non-EU trade Gazprom Methanol shipped 15,100 tons to China in September whilst Shchekinoazot, Azot Novomoskovsk and Azot Nevinnomyssk supplied a total of 18,000 tons to Turkey. Tomet exported very small volumes since May and from the end of May has only operated one line. The restart of the second line was planned for mid-September but has been put on hold.

Export volumes for Russian methanol in the first nine months increased to 1.581 million tons versus 1.397 million tons in the same period in 2021. The main reason for the higher exports was due to the start-up of the third unit M-500 at Shchekinoazot in September 2021 where shipments rose from 508,000 tons to 847,000 tons. Tomet reduced export shipments to 120,100 tons against 165,400 tons in January to

Russian Methanol Exports by Destination (unit-kilo tons)		
Country	Jan-Sep 22	Jan-Sep 21
Belarus	175.818	93.558
China	53.992	0.000
Czech R	0.001	0.195
Finland	575.838	644.357
Georgia	0.000	0.024
Germany	1.435	1.577
Israel	0.000	0.000
Kazakhstan	28.399	18.209
Latvia	60.943	8.544
Lithuania	46.559	64.024
Netherlands	137.072	93.235
Poland	333.099	223.102
Romania	26.488	59.109
Slovakia	49.035	171.150
Spain	0.000	0.000
Switzerland	0.000	0.000
Turkey	88.005	6.423
UK	8.398	0.000
Ukraine	11.916	49.937
Others	0.677	1.989
Total	1597.676	1435.432

September last year. In the first half of 2022 Tomet's exports exceeded last year's volumes but the lack of activity in the third quarter meant numbers are now much lower than in 2021.

Gazprom Methanol at Tomsk reduced export shipments from 306,400 tons in January to September 2021 to 139,300 tons after the Finnish route became more difficult. However, shipments from Gazprom Methanol to China have started this year and are helping to partly replace European exports. At the same time volumes from Tomsk to Hamina-Kotka have been shipped intermittently over the summer months.

Russian methanol exports to Belarus increased to 175,818 tons in the first nine months against 93,558 tons in the same period last year. Exports to Kazakhstan in January-September 2022 rose to 28,399 tons from 18,209 tons whilst shipments to Poland rose from 223,102 tons to 333,099 tons. Poland has acted as the conduit for Russian shipments to South-East Europe.

Romania has not been able to receive methanol from Russia since the end of February and thus imports fell in the first nine months to 26,488 tons from 59,109 tons. Slovakia is facing the same delivery issues reduced imports from 171,150 tons in January to September last year to 49,035 tons. Methanol exports to Finland declined from 644,357 tons in January to September 2021 to 575,838 tons this year. Russian producers are actively seeking new customers and alternative routes for shipments to replace lost business in northern Europe.



Whilst methanol exports to China have not previously been considered by Russian producers' volumes have started to be shipped from Tomsk through the Russian Far East port Vostochny. Producers expect a drop in demand for Russian methanol in Europe and over time want to reorient of exports to Turkey and the Asia-Pacific region. At present these goals are complicated by logistical problems.

Russian Methanol Domestic Sales (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Azot Nevinnomyssk	15.5	17.3
Azot Novomoskovsk	105.6	121.0
Metafrax Chemicals	301.6	316.7
Gazprom Methanol	270.5	299.6
Tomet	253.2	266.3
Shchekinoazot	218.4	142.8
Ammoni (Mendeleevsk)	38.6	49.8
Total	1203.4	1213.6

Russian methanol domestic sales, Jan-Sep 2022

Merchant sales of methanol on the Russian domestic market amounted to 1.203 million tons in the first nine months against 1.214 million tons in the same period in 2021. Domestic consumption has shown signs of a slow decline in 2022 with monthly merchant sales volumes since the middle of the year dropping below comparative months in 2021 down.

Tomet supplied 253,200 tons to the domestic merchant market in the first nine months against 266,300 tons in the same period last year, making it the third largest provider on the domestic merchant

market. The largest consumer for Tomet is Togliattiazot where methanol is used for the production of urea-formaldehyde concentrate.

Russian Formaldehyde Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Pigment	27.568	28.840
Shchekinoazot	23.154	24.404
Akron	102.726	131.790
Metafrax	258.053	309.192
Sverdlov Plant	10.936	13.873
Khimsintez	31.179	36.349
Uralkhimplast	33.317	44.630
Nizhnekamskneftekhim	54.439	55.595
Gazprom Methanol	0.000	53.031
Metadynea	23.591	18.793
Total	564.964	716.497

Gazprom Methanol reduced domestic shipments of methanol from 299,600 tons in the first nine months in 2021 to 270,500 tons in the same period in 2021. Previously formaldehyde was produced by Gazprom Methanol, but the assets were sold in 2021.

Shchekinoazot increased domestic sales from 142,800 tons to 218,400 tons. Metafrax Chemicals reduced merchant shipments to the domestic market from 316,700 tons in January to September 2021 to 301,600 tons in the first nine months this year.

Formaldehyde production in Russia has slowed in recent months due to weak demand, thus reducing purchases of methanol. Production amounted to 564,964 tons in the first nine months in 2022 versus 716,497 tons in the same period in 2021.

Russian Formaldehyde Resin Production (unit-kilo tons)		
Category	Jan-Sep 22	Jan-Sep 21
Urea-formaldehyde concentrate	227.257	255.443
Urea-formaldehyde resins	792.116	1004.116
Phenol-formaldehyde resins	324.503	379.223

The production of urea-formaldehyde concentrate fell in the first nine months to 227,257 tons against 255,443 tons in the same period in 2021. The production of urea-formaldehyde resins dropped from 1.004 million tons to 792,116 and phenol-formaldehyde resins fell from 379,223 tons to

324,503 tons. Resin producers have been faced by higher costs which combined with lower demand impacted on profits in 2022.

Methanol conundrum and new terminals

Most producers do not expect a change in the international environment that would allow some return to normal business for the foreseeable future, assuming no seismic shifts in Kremlin attitudes, and thus are being forced by sanctions to devise new marketing strategies. Having to develop new strategies in order to survive. EU sanctions which come into force on 8 January 2023 makes reorientation even more important.

The issue of building new methanol terminals in Russia has been has risen in significance after the introduction of new sanctions by the EU which come in to force from 8 January 2023. The sanction

Russian Methanol Plants-Distances to Nakhodka-Vostochny	
Plant location	Distance (km)
Tomsk	5709
Gubakha	7877
Novomoskovsk	9290
Shchekino	9363
Mendeleevsk	8236

regulations also state that this date only allows for contracts concluded up to 7 October this year. The Nakhodka-Vostochny terminal was constructed in 2004 with capability of transshipment of methanol, but since its inception the terminal has concentrated on other products based on oil or coal. Thus, some reprofiling has been required this year in order to allow Gazprom

Methanol at Tomsk to send methanol to the Nakhodka-Vostochny port for export to China, only starting in July. Although the original capacity of the terminal was for 1 million tpa of methanol, until this year hardly any product had passed through.

Market reorientation and margins

Reorientation of Russia's methanol exports from Europe to Asia is recognised as technically possible, but the main problem for producers is lower profitability. The total net import of methanol by China, India and South Korea exceeded 15 million tons in 2021 and thus this whole market possesses some potential

depending on plant locations. The cost of methanol production by Russian companies is much lower than Chinese producers which use coal as a raw material.

Despite lower costs Russian producers face serious competition in East and South Asia where there is a presence of suppliers from the Middle East, and also US. A large volume of supply of Middle Eastern suppliers keeps spot prices for methanol in China at a relatively low level. At the same time, logistics costs to Asian markets are at least a quarter higher than the level of supply costs to Europe.

Russian producers in the western parts of Russia are most disadvantaged by the reorientation of export activity. European markets have traditionally been very profitable for Russian methanol producers and cannot be replaced in the short term. In the context of sanctions caused by the government's war in Ukraine, producers implicitly believe the state has a duty to both help the development of the domestic market and to support the construction of new infrastructure to cope with new export markets.

Nakhodka methanol project & terminal

The first unit intended to start production at Nakhodka from the NZMU fertiliser complex, under construction, is expected to be the 1.8 million tpa methanol plant. This part of the project is reported to be the most



Site for Nakhodka's methanol terminal

advanced, although still questions on licensing from Haldor Topsoe need to be resolved which could provide a stumbling block. The construction site of the methanol plant is located between the bays of Wrangel and Kozmino, within the boundaries of the water protection zones of the Nakhodka Bay of the Sea of Japan. Accordingly, the project documentation provides for a number of measures to restrict the impact of the complex on local aquatic biological resources and their habitat.

methanol plant. The terminal is essential for the methanol plant and its sales and would be located around

20 km from the existing Vostochny terminal. The planned approach comprises areas for vessels to be received and processed here for loading methanol delivered by pipeline from the plant. The area of the terminal's water area will be 38,300 square metres, the planned cargo turnover is 1.8 million tpa and the methanol loading capacity is 1,250 tons per hour.

Volgograd methanol project-update

Despite the loss of the investor Marubeni from the Volgograd methanol project preliminary surveys have been undertaken for the plant construction. Furthermore, a Special Economic Zone (SEZ) was created in October as the basis for the methanol plant, on a plot of 27.6 hectare which is located at the former Khimprom site at Volgograd. In addition to the plant for the production of methanol, the SEZ plans to establish the production of bioproteins, plant protection products and acetic acid. There are still a number of hurdles to overcome before construction can start, particularly in the environmental sphere.

The original project cost for constructing a 1.0 million tpa methanol plant was estimated at \$800 million. The organisation AEON concluded agreements with Japanese companies Marubeni Corporation and Mitsubishi as technology partners, which have since distanced themselves from the project. Even prior to Russia's invasion of Ukraine this year, US and European companies were afraid to work with Russia based on those sanctions imposed on Russia after it occupied Crimea. At the end of March, the Japanese companies decided to withdraw from the project which now means that the Russian company is seeking another investor.

A berth will be built at the terminal, which will consist of a system of mooring and a technological platform. They also plan to build an approach overpass, technological pipelines and engineering communications will be placed here. At the berth it is planned to receive vessels of different sizes.

Shipment of methanol to ships will be carried out using two standers equipped with a system for constant monitoring of its position and an emergency disconnection system. It automatically disconnects the stander from the vessel in the event of unacceptable drift along or perpendicular to the berth. The methanol project at Nakhodka was originally intended for completion in 2023 but the war in Ukraine has put any launch date back even if technological questions are resolved.

Organic chemicals

Russian N-Butanol Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Angarsk Petrochemical company	23.3	19.1
Azot Nevinomyssk	12.8	10.0
Gazprom neftekhim Salavat	48.2	39.2
SIBUR-Khimprom, Perm	23.0	20.3
Total	107.2	88.6
Russian Isobutanol Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Angarsk Petrochemical Company	16.4	12.0
Gazprom neftekhim Salavat	24.8	22.2
SIBUR-Khimprom, Perm	42.4	24.7
Total	83.6	58.9

Russian Acetone Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Ufaorgsintez	24.6	35.4
Kazanorgsintez	41.0	38.0
Novokuibyshevsk Petrochemical	22.1	30.2
Omsk Kaucuk	21.8	19.7
Total	109.4	123.3

Isopropanol production in Russia dropped in the third quarter to 11,400 tons, from 12,600 tons in the second quarter. Record levels of isopropanol were achieved in the first quarter at 19,200 tons in which Omsk Kaucuk accounted for 9,000 tons. In other areas of solvent production Russian producers have reduced the production of ethyl acetate and butyl acetate because these products have a shelf life

Russian Isopropanol Production (unit-kilo tons)				
Producer	Q4 21	Q1 22	Q2 22	Q3 22
Sintez	1.2	1.5	1.1	0.4
Khimprom	8.0	0.8	0.5	0.7
Plant of Synthetic Alcohol	7.0	8.7	6.2	5.3
Omsk Kaucuk	9.0	8.2	4.8	4.9
Total	9.2	19.2	12.6	11.4

dropped by 78% compared to the same period in 2021, amounting to only 1,300 tons.

Russian paints industry Jan-Sep 2022

The production of paints and varnishes totalled 123,000 tons in the first three quarters this year which was 5.7% down on the same period in 2021. The exodus of Western coatings' manufacturers from the Russian market has not been beneficial to the domestic paints industry, which is mostly unable to fill the market gap, at least in the short term. Domestic consumers that previously worked only on Finnish or Norwegian materials are switching to domestic suppliers.

However, on average Russian paint manufacturers are operating at around 50% of capacity. The main barrier to increasing utilisation is obtaining sufficient orders from clients. In terms of industry structure, the industrial capacities of foreign companies that have left the Russian market are gradually moving to new owners. These enterprises will continue to produce paint and varnish products. There is a transition to raw materials from the Asia-Pacific countries. As Western companies refuse to supply paints and components for their production to Russia it needs domestic manufacturers to develop an

Russian butanol production Jan-Sep 2022

Russian normal butanol production rose from 76,300 tons in the first nine months in 2021 to 81,300 tons in 2022. Gazprom neftekhim Salavat was the largest Russian producer, increasing production to 39,200 tons against 48,200 tons in January to September 2021.

Isobutanol production in Russia increased from 58,900 tons to 83,600 tons in January to September 2022 during which Gazprom neftekhim Salavat reduced production from 22,200 tons to 24,800 tons, and SIBUR-Khimprom increased production from 24,700 tons to 42,400 tons.

Russian oxygenated solvents Jan-Sep 2022

Russian acetone production dropped from 123,300 tons in the first nine months in 2021 to 109,400 tons in the same period in 2022. Omsk Kaucuk produced 21,800 tons of acetone in the first nine months this year against 19,700 tons whilst Kazanorgsintez produced 41,000 tons, 3,000 tons more than last year. Acetone has sanctioned by the EU, preventing Russian exports.

(nine months from the date of production), and also in order not to overpack the warehouse and not freeze assets.

As a result of surplus availability ethyl acetate imports have dropped sharply this year. Overall, for the first nine months in 2022 imports of ethyl acetate

industry for paints and varnishes, but it will need time and the trust of shipbuilders. The market for marine paints in Russia is approximately 10-15,000 tpa.

Russian plasticizers market Jan-Sep 2022

Both Russian exports and imports of plasticizers have been falling this year which is attributable due to a range of issues including logistics, sanctions, etc. SIBUR has been reducing exports of DOTP

Russian Plasticizer Trade 2022 (unit-kilo tons)			
Exports			
	Q1 22	Q2 22	Q3 22
DOTP	3.925	1.623	3.545
Imports			
	Q1 22	Q2 22	Q3 22
DOP	0	0.958	0.763
DOTP	1.975	2.408	0.317
DINP	5.365	6.856	4.117

from Perm due to increased sales on the domestic market and the replacement of imports. Regarding imported plasticizers logistical bottlenecks have held up deliveries across of the board of DOP, DOTP and DINP.

For the domestic market prices for plasticizers in Russia have fallen in recent months due weakening demand. Availability is tight also despite low demand which means that producers such as Gazprom

neftekhim Salavat and Roshalsky Plasticizer Plant are both quoting higher numbers. The cost of dioctyl terephthalate (DOTP) varies in the range of 145,000-151,000 roubles (\$2294-2389) per ton. On the trading floor, SIBUR-Khimprom offers DOTP for 162,000 roubles (\$2608) per ton.

The main merchant suppliers of 2-EH are Angarsk Petrochemical and SIBUR-Khimprom. Despite lower domestic prices consumers of 2-EH have begun to buy imported product from China. For other plasticizer raw materials, the cost of phthalic anhydride increased at the beginning of the month due to the high cost of orthoxylene.

Russian Phthalic Anhydride Production (unit-kilo tons)		
Producer	Jan-Sep 22	Jan-Sep 21
Gazprom neftekhim Salavat	9.6	9.9
Kamteks-Khimprom	31.1	65.3
Roshalsky Plasticizer Plant	6.9	4.4
Total	47.6	75.2

Kamteks-Khimprom stopped production of phthalic anhydride

In the first nine months in 2022 Russian production of phthalic anhydride dropped to 47,600 tons against 75,200 tons in the same period last year. Kamteks-Khimprom had hoped to restart production in October but may need to

suspend at least another month. Up to 80% of products from Kamteks-Khimprom have traditionally been exported but the company has faced numerous problems regarding logistics, trade and production.

Other Russian plant news

SIBUR maleic anhydride exports start

Kuibyshevazot-Production (unit-kilo tons)		
Product	Jan-Sep 22	Jan-Sep 21
Polyamide-6	109.1	130.7
High Tenacity Tech Yarns	0.0	5.1
Tyre Cord Fabric	0.0	14.7
Caprolactam	142.2	152.3
Ammonia	794.0	838.4
Urea	269.8	266.0
Ammonium Nitrate	567.3	565.4
Ammonium Sulphate	236.0	258.9

SIBUR began exporting maleic anhydride from Tobolsk in October with the first batches sent to India. SIBUR hopes to increase exports to Asian markets as shipments to Europe have declined due to geopolitical tensions. By the end of the year, it is planned to bring the new production to the design capacity of 45,000 tpa. Russian and foreign consumers will receive it both in liquid form in specialized tanks, and in solid which could comprise pellets or flake.

Kuibyshevazot Jan-Sep 2022

Kuibyshevazot reduced the output of ammonia by 5.2% in January-September 2022 to 794,000 tons and ammonium sulphate by 8.6% to 343,400 tons. The production of

caprolactam also decreased by 6.9%, to 142,200 tons, polyamide-6 by 16.5% to 109,100 tons, polyamide yarn by 13.3% to 4,500 tons.

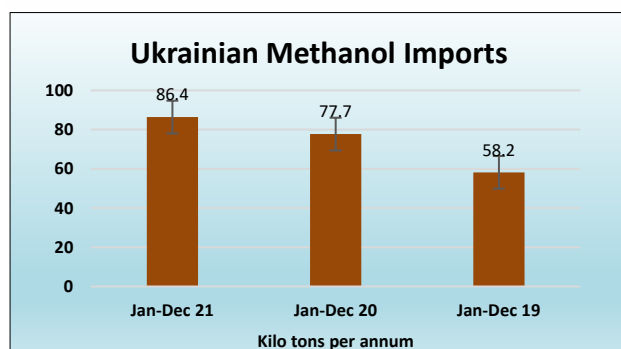
The company increased the output of ammonium nitrate by 6.9% in the first three quarters up to 567,300 tons and urea by 1.4% up to 269,800 tons. In the first nine months this year Kuibyshevazot completed the

construction of the granulated urea plant and started commissioning. The capacity of this unit is 525,000 tpa. Three polymerisation units were also overhauled at the polyamide plant. Another project is being undertaken by Kuibyshevazot for weak nitric acid with a capacity of 547,500 tpa.

Ukraine

Ukrainian new methanol contracts

The main Ukrainian methanol consumer Ukrgasvydobuvannya has sought contracts from Venezuela, Trinidad and Tobago, Azerbaijan and the EU for 2023. In previous years, deliveries were from Russia and Belarus. The new suppliers providing contracts include Caribbean Gas Chemical Limited, SOCAR, Mider-Helm and Supermetanol CA from Venezuela. The contracts include restrictions about supplies from manufacturers that are under sanctions due to Russia's attack on Ukraine. Prices in these contracts are much higher than previous years, when methanol of Russian and Belarusian production was supplied.



The previous contract of Ukrgasvydobuvannya in November 2021 included an indicative price of €450 per ton. In 2019-2020, prices being paid were in the range of €250-300 per ton. Then the supplier was the Swiss intermediary company AGTG SA.

The expected cost of the product according to the specified formula is 32,300 UAH per ton (€850), while its real cost, which is offered by companies' residents of Ukraine, is about 22,000 UAH per ton

(€579). Although Ukraine is vehemently opposed to purchasing methanol directly from Russia it is quite difficult to prevent traders from sourcing Russian product in meeting Ukrainian contracts.

Karpatneftekhim-legal challenges

Although Karpatneftekhim has been idle since 24 February 2022, since the Russian invasion of Ukraine, this has not prevented an investigation into deliberate tax evasion by the Bratsk district court. The court's decision contains a list of 35 real estate objects owned by Karpatneftekhim LLC. These are administrative, industrial buildings and structures, workshops, bases, eight land plots. The investigation is part of criminal proceedings on money laundering which during the period 2017-2022, the company's officials evaded paying more than 3 billion hryvnia in taxes and illegally transferred more than 5 billion hryvnia to a non-resident legal entity controlled by a Russian oil company for their further legalisation.

Central Asia

Uzbekistan MTO project

Gas Chemical Complex MTO Central Asia (GCC), the construction operator of the MTO Gas Chemical Complex in Uzbekistan, has identified Enter Engineering as the EPC contractor for a project to convert methanol to olefin (MTO). A contract worth about \$3 billion includes the design, procurement of equipment and construction of facilities, as well as the necessary infrastructure. Completion of the construction is expected in 2025.

Main Parameters for MTO Project in Uzbekistan	
Location	Karakul Free Economic Zone, Bukhara
Investment estimate	\$2.5 billion
Estimated gas consumption	1.3 billion bcm

Bukhara MTO Derivatives		
Product	Licensor	Capacity (ktpa)
PET	Chemtex	300
MEG	Scientific Design	n/a
Polypropylene	W. R. Grace & Co	257
LDPE/EVA	Versalis	80 or 100

The complex for the production of polymers will become an anchor resident in the newly created Karakul Free Economic Zone in the Bukhara region. The MTO Gas Chemical Complex (MTO GCC) is wholly owned by Sanoat Energetika Guruhi (SANEG), one of the largest oil and gas companies in Uzbekistan. The MTO technology will allow processing 1.3

billion m3 of Uzbekistan-specific natural gas with a low content of valuable components, which will be supplied from fields managed by SANEG.

The complex is to be designed to produce 250,000 tpa of polypropylene, and either 80,000 tpa of LLDPE or 100,000 tpa of ethylene vinyl acetate. Another product includes polyethylene terephthalate with a capacity of 300,000 tpa.

The project contractor Enter Engineering, which is based in Uzbekistan, may be pushed to the limit to complete the construction by 2025. As a rule, though most project announcements in Uzbekistan tend to materialise. Enter Engineering has mobilized the necessary resources and plans to use its own construction equipment teams of specialists and determine logistics routes for the delivery of equipment. At the time of the peak of construction, more than 10,000 builders will work at the site. Previous projects where Enter Engineering has been engaged include the GTL project at Shurtan and the ammonia and urea complex at Navoiyazot.

The MTO gas chemical complex will become the largest plant of this type in Central Asia for the production of polymer products, which will meet local demand for raw materials for the production of goods with high added value.

Kazakh polypropylene project completion

Kazakhstan Petrochemical Industries (KPI) aims to produce 110,000 tons of polypropylene from its new plant near Atyrau by the end of 2022. In order to accelerate domestic consumption, the government is prepared to grant KPI rights to certifying its own products. Domestic demand in Kazakhstan is estimated currently at around 50,000 tpa, but the availability of local polypropylene is expected to increase demand.

Kazakh polypropylene targets end of 2022	
Production	110,000 tons
November exports	10,500 tons

The first phases of polypropylene production started in August which apart from helping to increase non-fossil fuel exports for Kazakhstan will help to solve the shortage of polymer for domestic companies. The licensor of the technology of the plant at Atyrau is Lummus Technology, with parts of equipment supplied by companies such as Air Liquide, Siemens, Mitsubishi, etc. The construction and launch of the plant were postponed on numerous occasions and for various important reasons and as a result has taken close to fourteen years to complete.

Shipments of polypropylene to merchant consumers in the domestic market are already underway. In addition to domestic sales, exports are being directed to markets in Russia, China, and Turkey. The design capacity of the complex is 500,000 tpa, ultimately comprising a range of 65 types of polypropylenes.

At the end of November KPI exported the first container train (62 containers) loaded with polypropylene with a volume of 1,500 tons. At the same time, the first shipments of polypropylene to domestic processors were started, to companies RGC-Caspian, Universal, and ALPHA PLAST. By the end of November, the

company plans to supply more product to the domestic market and export six more container trains with a volume of 9,000 tons.

Azerbaijan methanol exports Jan-Sep 2022

SOCAR Methanol produced 402,300 tons of methanol in January-September 2022, which is 61.7% higher than in the same period last year. At the start of October, the company's warehouse had 36,400 tons of inventory. SOCAR Methanol exported 368,636 tons of methanol worth \$103.961 million for the first nine months in 2022.

Azerbaijan Methanol Market (unit-kilo tons)		
	Jan-Sep 22	Jan-Sep 21
Production	402.3	248.8
Exports	368.6	0.0

Azerbaijan-petrochemical production Jan-Sep 2022

In January-September Azerbaijan produced 92,600 tons of propylene, 94,900 tons of polyethylene, and 97,500 tons of ethylene. From the propylene production 88,500 tons was sold mostly to SOCAR Polymer which then produces polypropylene. Propylene production in Azerbaijan dropped 12.1% in the first nine months in 2022 and merchant propylene sales by 10.3%. The production of ethylene and polyethylene decreased by 21.2% and 22%, respectively.

Azerbaijan-petrochemical exports Jan-Sep 2022

Azerbaijan exported 276,824 tons of polymer products in the first three quarters, which is 11.8% less than in the same period in 2021. In total exports of plastics amounted to \$293.921 million in January to September 2022 which was 4.5% lower. Polyethylene exports amounted to 86,737 tons in the first three quarters for \$112.716 million whilst polypropylene exports amounted to 52,488 tons for \$72.432 million. Propylene copolymer exports totalled 20,102 tons for \$32.681 million.

The reduction in exports of polymer products is due to the suspension in April and May 2022 for the scheduled repair of the Baku Oil Refinery which raw materials to Azerkhimiya at Sumgait which, in turn, supplies ethylene and propylene to the nearby SOCAR Polymer plants.

Petrochemical capacity increases in Azerbaijan

Azerkhimiya is close to completing the modernisation and expansion of its petrochemical capacities at Sumgait which is expected to lead to higher production in 2023. Ethylene capacity is being increased from 110,000 tpa to 190,000 tpa with a further rise to 210,000 tpa, and propylene from 65,000 tpa to 187,000 tpa. The plant is currently undergoing post-modernisation assessment to see if these capacity expansions are working properly and if there is any need to replace equipment to increase ethylene production. Azerkhimiya also produces LDPE at the Ethylene-Polyethylene plant with a capacity of 60,000 tpa. The entire modernisation of the Ethylene-Polyethylene plant is expected to be completed fully in the first quarter in 2023.

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