

# CIREC MONTHLY news

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

Edited by Andrew Sparshott CIREC Limited

Telephone: +441202 959770 Email: [support@cirec.net](mailto:support@cirec.net) Web: [www.cirec.net](http://www.cirec.net)

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

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## **Key points from this issue:**

### **Central European petrochemical markets**

- PKN Orlen generated a net profit result of €2.261 billion in 2021 against €623.91 million in 2020
- Ethylene production at Plock dropped from 482,700 in 2020 to 348,700 tons in 2021
- Exports of PTA declined from Poland last year due to lower production volumes, dropping from 605,000 tons in 2020 at Wloclawek to 518,000 tons
- MOL's net profit for 2021 totalled €1.5 billion against a net loss of €50.5 million in 2020
- Imports of methanol into Poland totalled 696,110 tons in 2021 against 677,074 tons in 2020

### **Russian chemical production**

- Russian chemical and petrochemical production rose 6.4% in 2021 vs 2020
- Russian ethylene production totalled 4.402 million tons in 2021 against 4.208 million tons in 2020
- Russian propylene production amounted to 3.036 million tons in 2021 against 2.582 million tons in 2020
- Russian styrene production fell from 773,500 tons in 2020 to 724,500 tons in January to December 2021
- Nizhnekamskneftekhim produced 511,000 tons of synthetic rubber in the first three quarters of which around 85% was exported

### **Russian chemical trade**

- Propylene exports from Russia amounted to 153,200 tons in 2021 against 50,700 tons in 2020
- Export shipments of Russian paraxylene totalled 84,800 tons in 2021 against 141,300 in 2020
- Russian TDI imports totalled to 59,922 tons in 2021 against 51,165 tons in 2020. Values of Russian TDI imports increased from a total of \$70.758 million to \$154.581 million
- MDI imports into Russia amounted to 182,596 tons in 2021 against 130,395 tons in 2020, with costs rising from \$225.221 million to a total of \$450.546 million

### **Project news**

- ZapSibNeftekhim has completed construction and installation work on the maleic anhydride plant at Tobolsk
- The procedure of public hearings on the 1.8 million tpa methanol project at Indiga in the Pechora region has begun including environmental impact assessment materials
- For the GTL plant at Shurtan Uzbekneftegaz has signed a preliminary deal with Honeywell UOP on a project to produce linear alkylbenzenes
- PKN Orlen's major flagship investment in petrochemicals comprises the planned construction of the Olefin III petrochemical complex at Plock

## CENTRAL and SOUTH EAST EUROPE

| PKN Orlen's Petrochemical Division (€ billion) |            |            |            |
|--|------------|------------|------------|
|  | Jan-Dec 21 | Jan-Dec 20 | Jan-Dec 19 |
| Segment revenues                               | 3.996      | 2.766      | 3.446      |
| Profit/(Loss) from operations                  | 0.757      | 0.282      | 0.322      |
| Sales (thousand tons)                          | 1.074      | 1.117      | 1.135      |

### PKN Orlen Jan-Dec 2021

PKN Orlen generated a record net profit result of zł 10.241 billion (€2.261 billion) in 2021 against zł 2.825 billion (€623.91 million) in 2020. Aside energy, petrochemicals was a major driver for the group's profitability.

| PKN Orlen Petrochemical Margins (€/ton) |            |            |
|---|------------|------------|
| Product                                 | Jan-Dec 21 | Jan-Dec 20 |
| Ethylene                                | 646        | 518        |
| Propylene                               | 633        | 448        |
| Toluene                                 | 164        | 115        |
| Benzene                                 | 419        | 147        |
| Butadiene                               | 562        | 231        |
| Paraxylene                              | 316        | 300        |

The petrochemical division recorded revenues of €3.996 billion in 2021 against €2.766 billion in 2020 and €3.446 billion in 2019. The rise in revenues occurred in 2021 despite the lower physical sales at 1.074 million tons, down from 1.117 million tons in the preceding year. Profits from the petrochemical division rose to €757 billion in 2021 against €282 million in 2020 and €322 million in 2019, attributed largely to product margins, especially for olefins. Ethylene margins rose from €518 per ton in 2020 to €646 in 2021 whilst propylene rose from €448 per ton to €633. Butadiene margins showed the largest rise from the olefins, moving from €231 per ton to €562, whilst benzene recorded the highest rise in the aromatics from €147 per ton to €419.

| PKN Orlen Product Revenues (€ million) |            |            |
|--|------------|------------|
| Product group                          | Jan-Dec 21 | Jan-Dec 20 |
| Monomers                               | 797.6      | 607.4      |
| Polymers                               | 806.5      | 404.5      |
| Aromatics                              | 284.6      | 155.0      |
| Fertilisers                            | 297.6      | 177.5      |
| Plastics                               | 413.6      | 282.3      |
| PTA                                    | 321.0      | 299.6      |

Revenues for Orlen increased for all products in the chemical and petrochemical industries in 2021, with polymers almost doubling from €404.5 million in 2020 to €806.5 million. Despite lower olefin production at Plock revenues from ethylene, propylene and butadiene rose from €607.4 million to €797.6 million.

As a consequence of higher feedstock and energy prices PKN Orlen's operating costs increased by zł 36,093 million (€7.9 million) in 2021. The increase of costs of materials and energy consumption by 53% resulted from higher oil processing of 0.400 million tons. From its refineries in Poland, the Czech Republic and Lithuania the Orlen Group refined a total of 25.604 million tons in 2021.

| PKN Orlen Group Chemical Sales (unit-kilo tons) |            |            |
|---|------------|------------|
| Product group                                   | Jan-Dec 21 | Jan-Dec 20 |
| Monomers  | 794        | 899        |
| Polymers  | 603        | 498        |
| Aromatics                                       | 347        | 375        |
| Fertilisers                                     | 1,134      | 1,122      |
| Plastics  | 331        | 396        |
| PTA   | 518        | 631        |

### Orlen Group Q4 2021

In the fourth quarter sales revenues of the Orlen Group increased by 81% which was largely due to the rise in crude oil prices. Sales volume of the Orlen Group increased by 7% to 10.564 tons, mainly as a result of 10% higher volumes in the refining segment. Conversely petrochemical sales decreased by 7% versus Q4 2020 as a result of lower volumes from fertiliser and PTA shipments in Poland although higher sales took place in the Czech and Lithuanian market.

| PKN Orlen Production (unit-kilo tons) |            |            |
|---------------------------------------|------------|------------|
| Product                               | Jan-Dec 21 | Jan-Dec 20 |
| Ethylene                              | 348.7      | 482.7      |
| Propylene                             | 349.4      | 441.7      |
| Butadiene                             | 43.1       | 60.5       |
| Toluene                               | 11.3       | 10.9       |
| Phenol                                | 45.6       | 44.2       |
| Polyethylene                          | 240.3      | 335.5      |
| PVC                                   | 224.5      | 289.4      |
| Polypropylene                         | 301.7      | 345.0      |

Ethylene production at Plock dropped from 482,700 in January to December 2020 to 348,700 tons in 2021, whilst propylene fell from 441,700 tons to 349,400 tons and butadiene from 60,500 tons to 43,100 tons. Phenol production at Plock increased from 44,200 tons in 2020 to 45,600 tons in 2021, despite undertaking a shutdown in mid-September lasting until mid-October.

| PKN Orlen Group Chemical Production<br>(unit-kilo tons) |            |            |
|---|------------|------------|
| Product group   | Jan-Dec 21 | Jan-Dec 20 |
| Monomers  | 858        | 1,007      |
| Polymers  | 640        | 475        |
| Aromatics   | 345        | 371        |
| Fertilisers   | 1,121      | 984        |
| Plastics  | 340        | 387        |
| PTA   | 518        | 605        |

Maintenance shutdowns at the separate divisions in the fourth quarter had the effect of reducing sales by 2% to 1.3 million tons. This involved the olefins and polyolefins division, in addition to the metathesis unit at Plock, and the PTA unit at Wloclawek reduced sales of petrochemicals by 7% in the fourth quarter against the same period in 2020.

#### Design of Olefin III for PKN Orlen underway

Aside the significant investments into green energy in conjunction with Synthos, PKN Orlen's major flagship investment in petrochemicals comprises the planned construction of the Olefin III petrochemical complex at Plock. Currently, the design and contracting stage of long-term deliveries is underway. Location and environmental decisions were also obtained, and an application for a building permit was submitted.

#### PKN Orlen-phenol and acetone investments

This year Orlen wants to make a final decision on the expansion of phenol production capacity at Plock. A new installation of phenol and acetone would allow to extend the benzene product chain and would enable the development of the product portfolio towards phenol and acetone derivatives. If it is built, the production capacity of phenol at Plock would increase from 46,000 tpa to 200,000 tpa. The current phenol plant is scheduled for maintenance between 23 May this year and 10 June.

The Olefins III complex is intended to be built by a consortium including Hyundai Engineering Co., and Tecnicas Reunidas. Construction work on the complex is scheduled to be completed in the first quarter of 2024, to enable commissioning at the start of 2025. From an estimated cost of zł 13.5 billion (€2.945 billion)

Orlen wants to obtain funding for this project from the "Programme for supporting investments of significant importance for the Polish economy for

the years 2011-2030". The Olefin III complex is expected to start production at the beginning of 2025, although this date is provisional.

#### Polish PTA sales Jan-Dec 2021

Orlen sold a total of 518,000 tons of PTA both on the domestic market and for exports for the period January to December 2021, measured against 632,000 tons in the same period in 2020. Total sales revenues rose from zł 1384 million (€299.6 million) to zł 1483 million (€321.0 million) with average prices rising overall from €474 per ton to €620 per ton. Export revenues amounted to €230.626 million in 2021, equating to €631 per ton.

Exports of PTA declined from Poland last year due to lower production volumes, dropping from 605,000 tons in 2020 at Wloclawek to 518,000 tons. PKN Orlen restarted the PTA plant in the second half in November

| Polish PTA Exports (unit-kilo tons) |            |            |
|-------------------------------------|------------|------------|
| Country                             | Jan-Dec 21 | Jan-Dec 20 |
| Belarus                             | 13.4       | 28.9       |
| Germany                             | 318.8      | 315.1      |
| Lithuania                           | 21.7       | 20.8       |
| Switzerland                         | 4.7        | 8.9        |
| Turkey                              | 0.0        | 16.7       |
| Others                              | 7.0        | 28.0       |
| Total                               | 365.6      | 418.3      |

after a two-month outage which was the main cause of the decline. The outage helped increase the demand for PTA imports. In addition to increased demand production issues meant that PTA imports into Poland in 2021 totalled 65,000 tons against 25,300 tons in 2020. The largest share of PTA imports came from the Netherlands. In addition to rising PTA imports Poland increased imports of paraxylene feedstocks from 13,700 tons in 2020 to 95,700 tons.

PTA exports from Poland amounted to 418,329 tons in 2020 to 365,565 tons in 2021. Average prices for Polish PTA exports in 2021 amounted to \$617 per ton. Germany remained the main customer for Polish PTA, taking 318,100 tons in 2021 against 315,100 tons in 2020. Lithuania was the second largest destination for PTA export shipments, taking 21,700 tons. At the start of 2022 due to delayed PTA shipments Lithuania's Neo Group has faced PTA supply problems and had to reduce capacity utilisation at the PET plant in Klaipeda (480,000 tpa capacity). Belarus reduced PTA purchases from Poland to 13,400 tons in 2021 from 28,900 tons in 2020. Due to the deteriorating relations between the EU and Belarus it is not clear how long Poland can supply PTA to this market. To compensate for a possible drop in sales PKN Orlen was seeking in January to arrange transport for a new PTA client in the Netherlands.

| Czech Petrochemical Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Product                                      | Jan-Dec 21 | Jan-Dec 20 |
| Ethylene                                     | 22.662     | 15.964     |
| Propylene                                    | 5.056      | 5.145      |
| Butadiene                                    | 2.453      | 0.803      |
| Benzene                                      | 47.831     | 29.049     |
| Toluene                                      | 8.521      | 7.522      |
| Ethylbenzene                                 | 130.265    | 100.654    |

#### Orlen Unipetrol Jan-Dec 2021

Orlen Unipetrol increased revenues by 61% in 2021 over 2020 to Kc 133.6 billion (€5.45 billion) and reported an operating profit of Kc 6.3 billion and a net profit of Kc 3.2 billion. Orlen Unipetrol started an investment plan last year which consists of a new eleventh furnace being installed by Technip Energies at Litvinov which will raise capacity from 545,000 tpa to 585,000 tpa. The volume of processed oil for Orlen Unipetrol in 2021 amounted to 6.4 million tons against 6.1 million tons in 2020.

| Orlen Unipetrol Polyolefin Exports |            |            |
|------------------------------------|------------|------------|
| HDPE                               | Jan-Dec 21 | Jan-Dec 20 |
| Vol (ktons)                        | 326.3      | 298.5      |
| Value (€ mil)                      | 453.3      | 246.3      |
| PP                                 | Jan-Dec 21 | Jan-Dec 20 |
| Vol (ktons)                        | 276.0      | 214.4      |
| Value (€ mil)                      | 390.2      | 222.5      |

Sales of refining products totalled 5.8 million tons in 2021, including 2.0 million tons of petrochemical products stood at 2.0 million tons. Due to the introduction of the PE3 plant at Litvinov HDPE exports increased from 298,500 tons in 2020 to 326,300 tons. HDPE export revenues increased from €246.3 million to €453.3 million.

Aside the focus on decarbonisation, energy performance reduction, renewables recycling, etc, Orlen Unipetrol has identified an increase in petrochemical production as the main goal of the strategy in the current decade. As part of this process Orlen Unipetrol has replaced

the existing brown coal boiler room at Litvinov to ensure the operation of the ethylene unit. The new gas boiler room involved investment of around Kc 1.2 billion (€47.3 billion). The new technology enables Orlen Unipetrol to meet the requirements of Czech and EU air protection legislation, including tightened emission limits for large combustion plants which came into effect in August 2021.

| Czech Petrochemical Imports (unit-kilo tons) |            |            |
|--|------------|------------|
| Product                                      | Jan-Dec 20 | Jan-Dec 20 |
| Ethylene                                     | 3.220      | 3.565      |
| Propylene                                    | 42.287     | 51.496     |
| Butadiene                                    | 75.646     | 63.635     |
| Benzene                                      | 70.603     | 81.201     |
| Toluene                                      | 7.109      | 6.140      |
| Styrene                                      | 58.057     | 34.740     |

#### Czech petrochemical trade, Jan-Dec 2021

Czech exports of ethylbenzene rose in 2021 to 130,265 tons from 100,654 tons in 2020. All the ethylbenzene was shipped from Kralupy to Oswiecim in Poland, all within the structures of the Synthos Group. Ethylene exports from the Czech Republic increased from 15,964 tons in 2020 to 22,662 tons in 2021 whilst imports dropped from 3,565 tons to 3,193 tons. Propylene imports dropped from 51,496 tons in 2020 to 42,287 tons. Czech imports of butadiene

rose from 63,635 tons in 2020 to 75,646 tons of which Germany supplied a total of 64,051 tons and Hungary 9,572 tons.

| MOL's Olefin & Polyolefin Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Product   | Jan-Dec 21 | Jan-Dec 20 |
| Ethylene  | 840        | 798        |
| Propylene   | 431        | 408        |
| Butadiene   | 96         | 60         |
| Raffinate   | 144        | 88         |
| Product   | Jan-Dec 21 | Jan-Dec 20 |
| LDPE  | 262        | 248        |
| HDPE  | 401        | 386        |
| PP  | 546        | 536        |

#### MOL Q4 and 2021

MOL's net profit for 2021 totalled 526 ft billion (€1.5 billion) against a net loss of 18 ft billion (€50.5 million) in 2020. Volatile market conditions were overcome by higher refinery and petrochemical margins, the latter which rose from €384.3 per ton in 2020 to €719.9 per ton in 2021.

Refined crude for the MOL Group totalled 4.170 million tons in the fourth quarter in 2021 against 3.970 million tons in the same period in 2020. Ethylene production for MOL's two sites at Tiszaújváros and Bratislava amounted to 840,000 tons in 2021 versus 561,000 tons in 2020 whilst propylene increased from 408,000 tons to 431,000 tons.

Butadiene production at Tiszaújváros increased from 60,000 tons in January to December 2020 to 96,000 tons in 2021 whilst raffinate production rose from 88,000 tons to 144,000 tons. In the polyolefin division the MOL Group in Hungary produced 546,000 tons of polypropylene against 536,000 tons in 2020 and 401,000 tons of HDPE against 386,000 tons.



The polyol project at Tiszaújváros exceeded 93.6% of the project schedule at the end of Q4 from 89% at the end of the third quarter. MOL aims to complete the 200,000 tpa polyol project in the second quarter in 2022, together with the propylene glycol and propylene oxide plants. Also in 2022, the group aims to focus more on investment on small-to-mid-size projects (e.g., metathesis, maleic anhydride). MOL already produces maleic anhydride at Szazhalombatta.

| <b>Polish Imports of Propylene (unit-kilo tons)</b> |                   |                   |
|---|-------------------|-------------------|
| <b>Country</b>                                      | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Lithuania   | 6.415             | 20.587            |
| Germany   | 104.579           | 11.785            |
| Russia  | 48.858            | 21.449            |
| Ukraine   | 74.847            | 75.790            |
| Others  | 3.278             | 9.248             |
| <b>Total</b>  | <b>237.978</b>    | <b>138.858</b>    |

#### **Polish propylene imports, Jan-Dec 2021**

Poland increased imports of propylene in 2021 due largely to lower production at Plock. Imports totalled 237,978 tons in the period January to December 2021 for a total cost of €221.325 million against 138,858 tons for €81.850 million.

Average prices for propylene imports into Poland rose from €589 per ton in January to December 2020 to €930 per ton in 2021. Germany supplied 104,579 tons of

propylene to Poland in 2021 against 11,785 tons in 2020 whilst imports from Ukraine dropped from 75,790 tons to 74,487 tons. Russia increased shipments to 29,400 tons from 12,300 tons.

| <b>Polimery Police-Project Progress</b> |                            |
|---|----------------------------|
| <b>Month</b>                            | <b>Percentage Progress</b> |
| October 21                              | 78%                        |
| December 21                             | 80%                        |
| January 22                              | 83%                        |

#### **Grupa Azoty Polyolefins-extension of contract for Polimery Police**

Grupa Azoty Polyolefins has concluded an annex to the agreement with Hyundai Engineering for the Polimery Police project which increases the contractor's remuneration by €72.48 million and extends the project schedule by six months. The company

stipulated that the conclusion of the annex does not exceed the budget of the Polimery Police project,

| <b>Polish Polypropylene Trade</b> |                   |                   |
|-----------------------------------|-------------------|-------------------|
| <b>Exports</b>                    | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Vol (kilo tons)                   | 202.4             | 180.9             |
| Value (€ million)                 | 289.1             | 180.8             |
|                                   |                   |                   |
| <b>Imports</b>                    | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Vol (kilo tons)                   | 772.1             | 575.1             |
| Value (€ million)                 | 1091.9            | 616.9             |

and the increase in the contractor's remuneration will be financed from the project reserve. At the end of August 2021, Hyundai Engineering returned to Grupa Azoty Polyolefins with proposals to increase remuneration by €127.4 million and to extend the contract schedule time by 181 days. Whilst the extension has been agreed the remuneration was negotiated at \$55 million lower than Hyundai requested.

a transshipment and storage terminal and logistics infrastructure. The total estimated budget of the project is over €1.5 billion, making it the largest investment in the Polish chemical industry. The completion of the investment is currently planned for 2023.

The integrated chemical complex of Polimery Police will include installations for the production of propylene and polypropylene,

| <b>Synthos Production (unit-kilo tons)</b> |                   |                   |
|--|-------------------|-------------------|
| <b>Product</b>                             | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Polystyrene                                | 71.5              | 64.3              |
| EPS  | 107.0             | 102.5             |
| Synthetic Rubber                           | 275.2             | 281.8             |

#### **Synthos-production Jan-Dec 2021**

Synthos increased production of general polystyrene at Oswiecim from 64,300 tons in 2020 to 71,500 tons in 2021, whilst expandable polystyrene increased from 102,500 to 107,000 tons. Synthetic rubber production dropped from 281,800 tons to 275,200 tons.

| <b>Polish Organic Chemical Trade</b> |                   |                   |
|--------------------------------------|-------------------|-------------------|
| <b>Exports</b>                       | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Vol (mil tons)                       | 3.106             | 2.770             |
| Value (€ billion)                    | 4.074             | 2.862             |
|                                      |                   |                   |
| <b>Imports</b>                       | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Vol (mil tons)                       | 1.444             | 1.596             |
| Value (€ billion)                    | 1.719             | 1.220             |

Regarding raw materials Synthos increased imports of butadiene in 2021 primarily due to lower production at Plock, with volumes rising from 102,100 tons to 119,300 tons in 2021. Supply sources are divided mostly between Austria, Germany and Hungary. Synthos has recently started its bio-butadiene project with Lummus.

Styrene imports into Poland totalled 104,500 tons in 2021 for a total cost of €115.8 million. The Netherlands supplied 88,000 tons to Poland in 2021, most of which went to Synthos.

| Polish Organic Chemical Imports (unit-kilo tons) |            |            |
|--|------------|------------|
| Product  | Jan-Dec 21 | Jan-Dec 20 |
| Acetic Acid                                      | 44.8       | 69.6       |
| Acetone  | 10.1       | 3.5        |
| Adipic Acid                                      | 10.7       | 10.5       |
| Butadiene  | 119.3      | 102.1      |
| Caprolactam                                      | 15.5       | 11.3       |
| Citric Acid                                      | 59.3       | 48.8       |
| DEG  | 27.1       | 22.2       |
| DINP/DOP   | 22.8       | 21.1       |
| Ethyl Acetate                                    | 21.1       | 16.7       |
| Ethylbenzene                                     | 136.4      | 99.1       |
| Ethylene Glycol                                  | 50.9       | 51.9       |
| Ethylene Oxide                                   | 26.5       | 13.2       |
| Isopropanol                                      | 11.2       | 19.0       |
| Lysine   | 54.1       | 56.2       |
| Maleic Anhydride                                 | 14.8       | 13.2       |
| Melamine   | 25.2       | 18.4       |
| Methanol   | 698.6      | 677.5      |
| Paraxylene                                       | 95.7       | 13.7       |
| Phenol   | 42.2       | 90.1       |
| Phthalic Anhydride                               | 35.7       | 28.0       |
| Propylene  | 237.7      | 137.8      |
| Propylene Glycol                                 | 25.1       | 25.5       |
| Propylene Oxide                                  | 4.2        | 2.5        |
| PTA  | 65.3       | 25.3       |
| Styrene  | 104.5      | 120.8      |
| TDI  | 81.2       | 80.1       |
| Toluene  | 23.1       | 22.2       |
| VAM  | 19.3       | 17.0       |

| Czech Methanol Imports (unit-kilo tons) |            |            |
|---|------------|------------|
| Country                                 | Jan-Dec 21 | Jan-Dec 20 |
| Germany                                 | 10.779     | 15.925     |
| Russia                                  | 58.002     | 40.127     |
| Poland                                  | 24.891     | 32.277     |
| Others                                  | 2.239      | 2.930      |
| Total                                   | 95.911     | 91.260     |

| Polish Methanol Imports (unit-kilo tons) |            |            |
|--|------------|------------|
| Country                                  | Jan-Dec 21 | Jan-Dec 20 |
| Belarus                                  | 2.620      | 13.609     |
| Finland                                  | 58.013     | 70.625     |
| Lithuania                                | 7.514      | 10.051     |
| Germany                                  | 84.014     | 10.138     |
| Netherlands                              | 25.739     | 0.000      |
| Norway                                   | 38.024     | 41.300     |
| Russia                                   | 468.194    | 514.454    |
| Others                                   | 11.991     | 16.897     |
| Total                                    | 696.110    | 677.074    |

in 2021 against 167,400 tons last year. Import prices of methanol averaged €317 per ton and export prices averaged €347 per ton.

### Polish organic chemical trade 2021

Imports of organic chemicals into Poland continued to heavily outweigh exports in 2021. Export values rose from €1.220 billion to €1.719 billion despite a fall in volumes from 1.596 million tons to 1.443 million tons. Import values for organic chemicals increased from €2.862 billion in 2020 to €4.074 billion in 2021, with volumes rising from 2.770 million tons to 3.106 million tons.

Poland is a large-scale importer of methanol in addition to olefin and aromatic monomers. Apart from propylene, butadiene and styrene, Poland imported 136,400 tons of ethylbenzene in 2021 against 99,100 tons in the same period last year. Export activity in the organic chemical sector is led by PTA, methanol and benzene. Caprolactam and acetone are also of significance. Benzene exports of 142,000 tons in 2021 were divided between Germany and Czech Republic taking 69,666 tons and 67,615 tons respectively.

### Central European isocyanates, Jan-Dec 2021

MDI imports into the Czech Republic totalled 40,968 tons in 2021 against 36,506 tons in the same period in 2020. Total costs for MDI imports rose from €54.344 million in January to December 2020 to €97.102 million in the same period in 2021, with average prices rising from €1.483 per ton to €2.401.

MDI imports into Poland totalled 167,547 tons in 2021 for a total value of €402.421 million. Average prices amounted to €2.370 per ton. TDI imports into Poland amounted to 81,051 tons in 2021 against 82,908 tons in the same period in 2020. Values in 2021 amounted to €204.798 million, equating to €2.524 per ton, up from €144.210 million in 2020 when prices averaged €1739 per ton.

### Central European methanol trade Jan-Dec 2021

Czech imports of methanol amounted to 95,911 tons in 2021 against 91,260 tons in 2020. Russia accounted for 41,668 tons in 2021, according to Czech statistics. Prices per ton for methanol imports into the Czech Republic increased from €237 in 2020 to €370 in 2021.

Imports of methanol into Poland totalled 696,110 tons in 2021 against 677,074 tons in 2020. Russia reduced exports from 514,454 tons to 468,194 tons whilst Finland reduced shipments from 70,625 tons versus 58,013 tons. Germany increased exports to Poland in 2021 to 84,014 tons from 10,138 tons in the previous year.

Exports of methanol from Poland dropped to 137,100 tons

## RUSSIA

| Russian Chemical Production<br>(unit-kilo tons) |            |            |
|---|------------|------------|
| Product   | Jan-Dec 21 | Jan-Dec 20 |
| Caustic Soda                                    | 1,280.0    | 1,276.0    |
| Soda Ash  | 3,429.0    | 3,320.0    |
| Ethylene  | 4,407.0    | 4,236.8    |
| Propylene                                       | 3,035.9    | 2,586.0    |
| Benzene   | 1,287.9    | 1,363.0    |
| Xylenes   | 479.6      | 474.7      |
| Styrene   | 741.5      | 731.1      |
| Phenol  | 259.9      | 260.8      |
| Ammonia   | 19,900.0   | 19,600.0   |
| Nitrogen Fertilisers                            | 11,358.0   | 11,166.0   |
| Phosphate Fertilisers                           | 4,282.0    | 4,256.0    |
| Potash Fertilisers                              | 10,678.0   | 9,455.0    |
| Plastics in Bulk                                | 11,085.0   | 10,176.0   |
| Polyethylene                                    | 3,512.0    | 3,426.0    |
| Polystyrene                                     | 591.0      | 580.4      |
| PVC   | 1,095.8    | 1,060.0    |
| Polypropylene                                   | 2,016.7    | 1,713.5    |
| Polyamide                                       | 198.0      | 162.0      |
| Synthetic Rubber                                | 1,718.0    | 1,535.0    |
| Synthetic Fibres                                | 202.0      | 173.0      |

| Russian Chemical & Plastics Trade (\$ billion) |        |        |
|--|--------|--------|
| Exports  | 2021   | 2020   |
| Chemicals                                      | 25.910 | 16.080 |
| Plastics and Rubber                            | 9.710  | 6.400  |
| Total  | 35.620 | 22.480 |
| Imports  | 2021   | 2020   |
| Chemicals                                      | 35.880 | 29.370 |
| Plastics and Rubber                            | 17.400 | 12.950 |
| Total  | 53.280 | 42.320 |

### Russian chemical production, Jan-Dec 2021

Russian chemical production rose 6.4% in 2021 over 2020, with the largest rise recorded in the output of mineral fertilisers. Ethylene production increased from 4.237 million tons in 2020 to 4.407 million tons in 2021 whilst propylene rose from 2.586 million tons to 3.036 million tons.

The production of polymers increased in Russia to 11.085 million tons in 2021 from 10.176 million tons in January to December 2020, including a rise in polyethylene production from 3.428.0 million tons to 3.512 million tons in 2020. More than half of the olefin and polyolefin production in Russia is undertaken by plants belonging to the SIBUR and TAIF groups which have now merged.

Russian plants produced 1.718 million tons of synthetic rubber in 2021, versus 1.535 million tons in 2020. Rubber markets improved in 2021 in terms of volume demand although high feedstock costs impacted on margins.

In the base chemical sector Russian ammonia production stabilised at 19.9 million tons in 2021 against 19.6 million tons. Caustic soda production amounted to 1.280 million tons against 1.276 million tons in 2020 whilst soda ash rose from 3.320 million tons to 3.429 million tons.

### Russian chemical trade Jan-Dec 2021

Higher costs and revenues increased the values in Russian chemical and plastics trade in 2021 over 2020. Import costs for chemicals and plastics increased from \$42.320 billion in 2020 to \$53.280 billion in 2021, whilst export revenues increased from \$22.480 billion to \$35.620 billion. High gas prices from the second quarter onwards drove fertiliser export revenues to record levels in 2021, whilst higher costs for pharmaceuticals and organic chemicals impacted to a lesser extent on import values. Imports of chemical industry products increased due to an increase in the supply of polymers and rubber by 28.4%, organic and inorganic chemistry products by

15.7%, and pharmaceutical products by 5%.

### Main points from Russian chemical and polymer trade in 2021

- Russia's net deficit in chemical trade dropped to \$17.6 billion in 2021 \$19.8 billion in 2020
- Main factor affecting chemical trade in 2021 was gas prices and the impact on fertiliser export revenues, which rose to a record level of \$12.5 billion against \$6.99 billion in 2020
- PTA imports into Russia totalled 297,600 tons in 2021 in 2021 against 296,700 tons in 2020. Average prices for PTA imports into Russia amounted to \$549.5 per ton in 2020 against \$712.6 in 2021
- Despite lower volumes Russian methanol export revenues rose from \$378.5 million to \$633.3 million
- Values of Russian TDI imports increased from a total of \$70.758 million in 2020 to \$154.581 million in 2021
- Russian import costs for MDI shipments totalled \$450.546 million against \$225.361 million in 2020
- Polypropylene export revenues increased from \$616.2 million in 2020 to \$1.049 billion in 2021, with HDPE exports rising from \$516.9 to \$936.4 million
- HDPE export revenues rose from \$516.9 million in 2020 to \$936.4 million in 2021
- Isoprene rubber and butadiene rubber export values increased from \$294.8 in 2020 to \$449.3 million in 2021 and from \$241.3 to \$415.5 million respectively

## Russian petrochemical markets

| Russian Ethylene Production (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                     | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Polymer Plant                        | 210.1      | 208.4      |
| Kazanorgsintez                               | 574.1      | 581.8      |
| Stavrolen                                    | 314.0      | 342.5      |
| Nizhnekamskneftekhim                         | 608.7      | 619.1      |
| Novokuibyshevsk Petrochemical                | 47.7       | 46.8       |
| Gazprom n Salavat                            | 317.3      | 376.4      |
| SIBUR-Kstovo                                 | 377.0      | 387.2      |
| SIBUR-Khimprom                               | 49.6       | 57.3       |
| Tomskneftekhim                               | 295.9      | 277.6      |
| Ufaorgsintez                                 | 96.1       | 116.1      |
| ZapSibNeftekhim                              | 1511.4     | 1193.2     |
| Total  | 4401.9     | 4206.4     |

ethylene production in 2021 to 314,000 tons against 342,500 tons in 2020.

| Russian Propylene Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                      | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Polymer Plant                         | 116.4      | 118.9      |
| Kazanorgsintez                                | 47.5       | 53.5       |
| Lukoil-NNOS                                   | 264.1      | 212.4      |
| Stavrolen                                     | 124.9      | 128.1      |
| Nizhnekamskneftekhim                          | 304.6      | 297.8      |
| Novokuibyshevsk                               | 60.0       | 39.0       |
| Omsk Kaucuk                                   | 35.1       | 35.4       |
| Polyom  | 192.4      | 169.8      |
| Gazprom n Salavat                             | 126.6      | 139.0      |
| SIBUR Kstovo                                  | 180.3      | 170.2      |
| SIBUR-Khimprom                                | 67.1       | 54.3       |
| Tomskneftekhim                                | 160.4      | 163.0      |
| SIBUR Tobolsk                                 | 3.0        | 377.4      |
| Ufaorgsintez                                  | 168.2      | 176.9      |
| ZapSibNeftekhim                               | 1185.0     | 446.3      |
| Total   | 3035.6     | 2581.9     |

tons to 133,200 tons in 2021. Lukoil-NNOS at Kstovo increased production from 175,000 tons to 183,400 tons.

| Russian Propylene Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                   | Jan-Dec 21 | Jan-Dec 20 |
| Lukoil-NNOS                                | 95.2       | 24.9       |
| SIBUR-Kstovo                               | 17.9       | 3.9        |
| Angarsk Polymer Plant                      | 39.1       | 0.8        |
| Stavrolen                                  | 1.0        | 21.1       |
| Total                                      | 153.2      | 50.7       |

demand for merchant propylene from around 70-80,000 tpa to 40,000 tpa. In 2021 ZapSibNeftekhim purchased 67,100 tons of propylene against 73,900 tons in 2020.

## Russian ethylene production, Jan-Dec 2021

Russian ethylene production totalled 4.402 million tons in 2021 against 4.208 million tons in 2020. ZapSibNeftekhim at Tobolsk produced 1.511 million tons in January to December, up from 1.193 million tons from January to December 2020. Nizhnekamskneftekhim produced 608,700 tons of ethylene against 618,100 tons in 2020 whilst Kazanorgsintez dropped from 581,800 tons to 574,100 tons.

Other important ethylene producers included SIBUR-Kstovo which produced 377,000 tons versus 387,200 tons. In Bashkortostan Gazprom neftekhim Salavat produced 317,300 tons against 376,400 tons, whilst Ufaorgsintez reduced production from 116,100 tons to 96,100 tons. Stavrolen at Budyennovsk reduced

## Russian propylene production, sales and exports, Jan-Dec 2021

Russian propylene production amounted to 3.036 million tons in 2021 against 2.582 million tons in 2020. The increase was due largely to the start-up of the plant at ZapSibNeftekhim at Tobolsk in 2020.

The combined ZapSibNeftekhim and SIBUR Tobolsk plants increased production from 823,700 tons in 2020 to 1.188 million tons in 2021.

In Tatarstan Nizhnekamskneftekhim produced 304,600 tons of propylene in 2021 against 297,800 tons in 2020 whilst Kazanorgsintez reduced production from 53,500 tons to 47,500 tons.

In Bashkortostan Gazprom neftekhim Salavat produced 139,000 tons versus 110,700 tons whilst Ufaorgsintez reduced production from 131,300 tons to 126,500 tons. In the Nizhny Novgorod region SIBUR-Kstovo increased production of propylene from 122,300

## ZapSibNeftekhim-PDH expansion

ZapSibNeftekhim has started work on the modernisation and expansion of the propane dehydrogenation unit at Tobolsk aimed at increasing propylene capacity up to 561,000 tpa. Due to the expansion in polypropylene production at Tobolsk in recent years, the capacities of the PDH plant do not meet the full need for raw materials. As a result, ZapSibNeftekhim is required to purchase propylene on the merchant market. The aim is to lower the



| Russian Propylene Domestic Sales (unit-kilo tons) |            |            |
|---|------------|------------|
| Company   | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Polymer Plant                             | 37.7       | 50.6       |
| SIBUR-Kstovo                                      | 137.0      | 149.7      |
| Lukoil-NNOS                                       | 164.9      | 165.6      |
| Others  | 15.5       | 11.9       |
| Total   | 355.1      | 391.1      |

| Russian Propylene Domestic Purchases (unit-kilo tons) |            |            |
|---|------------|------------|
| Consumer  | Jan-Dec 21 | Jan-Dec 20 |
| Saratovorgsintez                                      | 149.8      | 156.5      |
| Volzhskiy Orgsintez                                   | 11.4       | 10.7       |
| Akrilat   | 16.2       | 11.6       |
| SIBUR-Khimprom  | 49.7       | 65.9       |
| Omsk-Kaucuk   | 19.8       | 15.9       |
| Tomskneftekhim  | 3.8        | 10.1       |
| ZapSibNeftekhim                                       | 67.1       | 73.9       |
| Moscow Refinery                                       | 9.1        | 18.9       |
| Ufaorgsintez  | 9.1        | 9.1        |
| Khimprom Kemerovo                                     | 7.1        | 4.3        |
| Plant of Synthetic Alcohol                            | 8.2        | 20.6       |
| Others  | 13.4       | 7.6        |
| Total   | 364.6      | 405.5      |

156,500 tons to 149,800 tons which was largely due to an extended maintenance outage between May and August last year. Regarding other consumers, SIBUR-Khimprom reduced purchases from 65,900 tons to 49,700 tons

| Russian Styrene Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                    | Jan-Dec 21 | Jan-Dec 20 |
| Nizhnekamskneftekhim                        | 310.3      | 291.4      |
| Angarsk Polymer Plant                       | 40.1       | 50.7       |
| SIBUR-Khimprom                              | 133.0      | 142.8      |
| Gazprom n Salavat                           | 180.0      | 245.5      |
| Plastik, Uzlovaya                           | 61.1       | 43.1       |
| Total                                       | 724.5      | 773.5      |

| Russian Styrene Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                 | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Polymer Plant                    | 2.5        | 4.3        |
| Plastik Uzlovaya                         | 0.7        | 0.0        |
| Gazprom neftekhim Salavat                | 81.5       | 59.0       |
| Nizhnekamskneftekhim                     | 1.0        | 5.1        |
| SIBUR-Khimprom                           | 1.6        | 5.6        |
| Total                                    | 87.3       | 74.0       |

tons to 81,500 tons whilst SIBUR-Khimprom reduced export shipments from 5,600 tons to 1,600 tons.

Domestic merchant sales of styrene rose from 119,700 tons in 2020 to 130,700 tons in 2021. Angarsk Polymer Plant increased sales from 14,700 tons to 27,000 tons whilst Gazprom neftekhim Salavat reduced sales from 63,400 tons to 61,600 tons and SIBUR-Khimprom increased from 34,900 tons to 38,900 tons.

### Russian propylene exports and domestic sales Jan-Dec 2021

Propylene exports from Russia amounted to 153,200 tons in 2021 against 50,700 tons in 2020. Lukoil-NNOS increased export shipments from 24,900 tons to 95,200 tons whilst the Angarsk Polymer Plant shipped 39,100 tons against only 800 tons in 2020. Revenues from propylene exports jumped from \$20.1 million in 2020 to \$96.3 million in 2021.

Russian sales of propylene on the domestic merchant market amounted to 364,600 tons in 2021 against 405,500 tons in 2020. The largest propylene supplier to the domestic market was Lukoil-NNOS, shipping 164,900 tons against 165,600 tons in January to December 2020 tons followed by SIBUR-Kstovo which fell from 149,700 tons to 137,000 tons.

ZapSibNeftekhim reduced merchant propylene purchases from 73,900 tons in January to December 2020 to 67,100 tons in 2021. Saratovorgsintez reduced purchases of merchant propylene from

### Russian styrene production, sales and exports, Jan-Dec 2021

Russian styrene production fell from 773,500 tons in 2020 to 724,500 tons in January to December 2021. Nizhnekamskneftekhim increased production from 291,400 tons to 310,300 tons where most of the styrene is used internally for polystyrene and synthetic rubber output.

Due to extended maintenance downtime this year Gazprom neftekhim Salavat reduced styrene production from 245,500 tons in 2020 to 180,500 tons. SIBUR-Khimprom also extended its period for maintenance after stopping in August to September and thus overall production dropped from 142,800 tons to 133,000 tons in 2020.

Russian styrene exports amounted to 87,300 tons in 2021 against 74,000 tons in 2020. Gazprom neftekhim Salavat increased exports from 59,000

## Bulk Polymers

| Russian HDPE Production (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                 | Jan-Dec 21 | Jan-Dec 20 |
| Kazanorgsintez                           | 442.4      | 484.8      |
| Stavrolen                                | 285.7      | 318.0      |
| Gazprom neftekhim Salavat                | 95.9       | 121.9      |
| ZapSibNeftekhim                          | 1180.0     | 902.0      |
| Total                                    | 2004.0     | 1826.7     |

## Russian polyethylene production and trade, Jan-Dec 2021

Russian polyethylene production rose by 10% to 3.512 million tons in 2021 against 3.428 million tons in 2020. HDPE production rose 8% to 2.04 million tons whilst LDPE production rose 4% to 671,400 tons and LLDPE production rose 10% to 555,200 tons. ZapSibNeftekhim increased LLDPE production by 45,00 tons over 2020 to a total of 330,400 tons.

ZapSibNeftekhim increased production to 885,900 tons in 2021 in 2021 against 650,000 tons whilst Kazanorgsintez reduced production by 26% to 289,900 tons. Stavrolen rose slightly to 237,400 tons whilst Gazprom neftekhim Salavat reduced production by 28% to 66,800 tons.

| Russian Polyethylene Trade (unit-kilo tons) |            |            |
|---|------------|------------|
|   | Jan-Dec 21 | Jan-Dec 20 |
| Exports                                     | 1,331,503  | 1,056,263  |
| Imports                                     | 644,133    | 674,057    |
| Russian Polyethylene Trade (\$ million)     |            |            |
|   | Jan-Dec 21 | Jan-Dec 20 |
| Exports                                     | 1563.7     | 822.7      |
| Imports                                     | 1152.4     | 793.7      |

## Russian polyethylene trade Jan-Dec 2021

Russian polyethylene export prices averaged \$1174 per ton in 2021 against \$789 per ton in 2020. Excluding volumes to China, prices of Russian polyethylene exports in 2021 would have averaged \$1451 per ton. Polyethylene exports to China decreased slightly from 663,338 tons in the period January to December 2020 for \$475.0 million to 660,154 tons for \$589.4 million in 2021. Russia exported a total of 1.332 million tons of all grades of polyethylene in 2021 for \$1.140 billion against 1.056 million tons in 2020 for \$822.7 million.

| Russian HDPE Trade (unit-kilo tons) |            |            |
|-------------------------------------|------------|------------|
|                                     | Jan-Dec 21 | Jan-Dec 20 |
| Exports                             | 857,578    | 681,763    |
| Imports                             | 232,090    | 259,483    |
| Russian HDPE Trade (\$ million)     |            |            |
|                                     | Jan-Dec 21 | Jan-Dec 20 |
| Exports                             | 936.4      | 516.9      |
| Imports                             | 353.0      | 253.8      |

## Russian HDPE trade Jan-Dec 2021

HDPE exports from Russia totalled 776,831 tons in 2021 against 700,233 tons in 2020, with values rising from \$616.2 million to \$1.049 billion. Imports decreased from 259,483 tons to 232,090 tons and costs increased from \$253.8 million to \$353.0 million.

| Russian Polypropylene Trade (unit-kilo tons) |         |         |
|--|---------|---------|
|  | 2021    | 2020    |
| Exports                                      | 776,831 | 700,233 |
| Imports                                      | 167,218 | 155,177 |
| Russian Polypropylene Trade (\$ million)     |         |         |
|  | 2021    | 2020    |
| Exports                                      | 1049.3  | 616.2   |
| Imports                                      | 275.8   | 174.6   |

## Russian polypropylene trade Jan-Dec 2021

Polypropylene exports from Russia totalled 776,831 tons in 2021 against 700,233 tons in 2020, with values rising from \$616.2 million to \$1.049 billion. Imports increased from 155,177 tons to 167,217 tons and costs increased from \$174.6 million to \$275.8 million.

| Russian PVC Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                | Jan-Dec 21 | Jan-Dec 20 |
| Bashkir Soda                            | 268.2      | 267.6      |
| Kaustik                                 | 80.3       | 76.5       |
| RusVinyl                                | 349.4      | 339.8      |
| Sayanskkhimplast                        | 309.3      | 294.5      |
| Total                                   | 1007.2     | 978.4      |

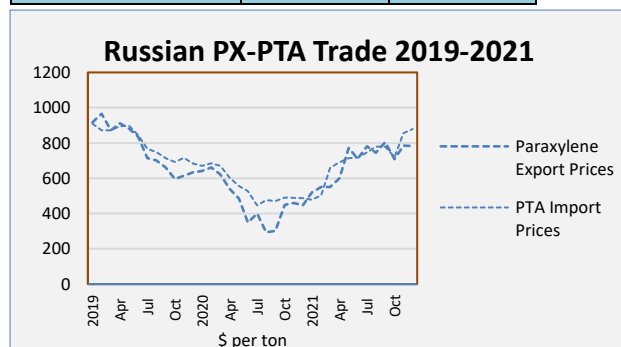
## Russian PVC production and trade, Jan-Dec 2021

Russian PVC production amounted to 1.007 million tons in 2021, which is 3% more than the 978,400 tons in 2020. RusVinyl produced 349,400 tons against 333,400 tons in 2020 whilst Sayanskkhimplast increased production to 309,300 tons against 298,800 tons. The Bashkir Soda Company increased production by 1% to 268,200 tons and Kaustik at Volgograd increased production to 80,300 tons from 76,500 tons. The Bashkir Soda Company (BSK) commissioned dichloroethane pyrolysis furnaces in January after reconstruction. The project will allow the chemical complex to produce 270,000 tpa of VCM.

Russian PVC imports totalled 208,000 tons in 2021 against 161,900 tons in 2020. Import costs rose from \$169 million to \$309 million. Exports amounted to 197,000 tons against 199,000 tons in 2020 with revenues jumping from \$152 million to \$169 million.

## Paraxylene-PTA-PET

| Russian Paraxylene Exports (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                    | Jan-Dec 21 | Jan-Dec 20 |
| Gazprom Neft                                | 46.9       | 82.2       |
| Kirishinefteorgsintez                       | 37.9       | 47.7       |
| Ufaneftkhim                                 | 0.0        | 11.4       |
| Total                                       | 84.8       | 141.3      |

**Russian paraxylene exports Jan-Dec 2021**

Export shipments of Russian paraxylene totalled 84,800 tons in 2021 against 141,300 in 2020. Exports declined last year, the lowest level in the past decade, due in partly to an increase in PTA production at Polief and partly due to plant outages. Protracted scheduled repairs were undertaken at the Ufaneftkhim plant belonging to Bashneft, and prevention was also carried out at the Kirishi refinery which belongs to Surgutneftegaz. This resulted in an overall decline of paraxylene production from 258,000 tons in 2020 to 184,157 tons in 2021.

Paraxylene export prices rose last year rising in line with higher feedstock costs, averaging \$670.9 per ton against \$434.6 in 2020. All of the paraxylene from Russia is exported to Finland and Belarus.

| Russian PTA Imports by Country (unit-kilo tons) |            |            |
|---|------------|------------|
| Country   | Jan-Dec 21 | Jan-Dec 20 |
| Belgium   | 21.0       | 8.0        |
| China   | 271.2      | 274.7      |
| South Korea                                     | 0.0        | 7.0        |
| Turkey  | 5.0        | 1.2        |
| Others  | 0.0        | 2.0        |
| Total   | 297.6      | 296.7      |

**Russian PTA imports, Jan-Dec 2021**

PTA imports into Russia totalled 297,600 tons in 2021 against 296,700 tons in 2020. Average prices for PTA imports into Russia amounted to \$549.5 per ton in January to December 2020 against \$712.6 per ton in the same period in 2021. Import costs overall rose from \$163.633 million to \$216.726 million.

| Russian PTA Imports by region (unit-kilo tons) |            |            |
|--|------------|------------|
| Region   | Jan-Dec 21 | Jan-Dec 20 |
| Kaliningrad                                    | 199.5      | 202.0      |
| Moscow   | 92.6       | 89.8       |
| Tyumen   | 5.0        | 2.5        |
| Others   | 0.6        | 2.4        |
| Total  | 297.7      | 296.7      |

Ekopet at Kaliningrad accounted for 62.8% of Russian PTA imports in 2021, paying \$136.1 million in value for 199,500 tons against \$108.9 million in 2020 for 202,000 tons. The Senezh PET plant near Moscow imported 92,628 tons of PTA in 2021 for \$75.3 million against 89,800 tons in 2020 for \$46.6 million.

**PTA import duties into Russia**

The Council of the Eurasian Economic Commission (EEC) approved the introduction of a zero rate of

customs duty on the import of terephthalic acid and its salts into the territory of the EAEU. This grouping covers Russia, Belarus and Kazakhstan. The new measure was introduced until March 2024 and replaces the previous duty at zero which expired at the end of 2021. The measure is introduced to fill the deficit in raw materials in the domestic market of the Eurasian Economic Union and meet the needs of enterprises engaged in the production of polyethylene terephthalate.

**Polief-PTA production Jan-Dec 2021**

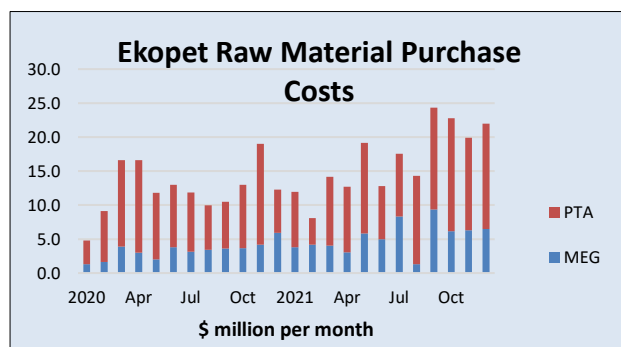
Polief's PTA production at Blagoveshchensk amounted to 266,800 tons in 2021 against 181,300 tons in 2020. Polief increased purchases of paraxylene in 2021 over 2020. Most of its paraxylene supply for Polief comes from Ufaneftkhim and other raw materials required for PTA production are also sourced domestically.

MEG purchases made by Polief comprise around 6,000 tons per month are made jointly from Nizhnekamskneftekhim and SIBUR-Neftekhim which are now part of the same group, whilst acetic acid is purchased from Russia's sole producer Azot at Nevinnomyssk. In 2021 Nizhnekamskneftekhim supplied

29,200 tons of MEG to Polief and SIBUR-Kstovo supplied 40,400 tons. Azot at Nevinnomyssk supplied 24,700 tons of acetic acid last year to the Polief plant.

### Tatneft abandons plans to construct second PET plant at Kaliningrad

Tatneft has abandoned plans to construct second PET plant at Kaliningrad, which it had formulated after the takeover of Ekopet in June 2021. Instead Tatneft is intending to concentrate on modernisation of the existing plant and raising capacity from 660 tons to 800 tons per day. For the past two years the plant has exceeded the design capacity, producing up to 705 tons per day.



Tatneft bought Ekopet for 6.45 billion roubles from Trust Bank. The nominal capacity of the plant for the production of PET is 220,000 tpa although production volumes have been in

excess of this number in the past two years.

Tatneft aims to complete its investment into the aromatics complex in 2023 which includes 200,000 tpa of paraxylene which would then facilitate the construction of a PTA plant. There is an intention to try and double this capacity to 400,000 tpa by 2024-2025 which would allow the construction of a PTA plant with a capacity of around 600,000 tpa.

| Russian Benzene Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                    | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Polymer Plant                       | 85.2       | 84.5       |
| Gazprom Neft                                | 105.7      | 97.8       |
| LUKoil-Neftekhim                            | 2.1        | 24.4       |
| LUKoil-Permnefteorgsintez                   | 50.1       | 49.5       |
| Magnitogorsk MK                             | 36.7       | 43.0       |
| Nizhnekamskneftekhim                        | 288.6      | 284.9      |
| Novolipetsk MK                              | 9.0        | 1.1        |
| Gazprom n Salavat                           | 188.4      | 199.6      |
| Severstal                                   | 33.5       | 36.1       |
| SIBUR-Holding                               | 89.4       | 74.9       |
| Slavneft-Yaroslavlorgsintez                 | 63.6       | 65.9       |
| Surgutneftegaz                              | 11.7       | 64.6       |
| Ryazan RN Holding                           | 34.5       | 32.8       |
| Ufaneftkhim                                 | 70.9       | 88.1       |
| Ural Steel                                  | 9.2        | 10.1       |
| Uralorgsintez                               | 93.2       | 87.6       |
| Zapsib                                      | 64.0       | 60.1       |
| Novokuibyshevsk Petrochemical               | 19.9       | 16.4       |
| Total                                       | 1255.7     | 1321.3     |

### Titan Polymer, PET & BOPET projects

Around 7.5 billion roubles (\$99.0 million) has thus far been invested in the construction of the Titan-Polymer plant, with another \$40 million required to complete the first stage. Including the second stage of the entire project around 20 billion roubles (\$264.0 million) will be invested.

Around 80% of the project construction is completed of the facilities, including eventual capacities of 170,000 tpa of PET and 72,000 tpa of BOPET. The Pskov company MetAvtoStroy, which provides special equipment for rent, has been working with the Titan-Polymer plant since the very beginning of construction. This is the largest construction project in the region.

### Aromatics

#### Russian benzene production Jan-Dec 2021

Russian benzene production amounted to 1.256 million tons in 2021 against 1.321 million tons in 2020. Nizhnekamskneftekhim increased benzene production slightly from 284,900 tons to 288,600 tons, whilst Gazprom neftekhim Salavat reduced production from 199,600 tons to 188,400 tons.

Extended shutdowns at the aromatics' complexes at Kirishinefteorgsintez and Ufaneftkhim impacted on the domestic supply/demand balance in the fourth quarter. Neither of those plants sell much benzene on the merchant market, but these outages mean that product was redirected from other suppliers creating bottlenecks. Of some help to the market is the restart of Stavrolen at Budyennovsk in December but overall for 2021 the plant produced only 2,100 tons against 24,400 tons in 2020.



| Russian Benzene Consumers<br>(unit-kilo tons) |            |            |
|---|------------|------------|
| Consumer                                      | Jan-Dec 21 | Jan-Dec 20 |
| Kuibyshevazot                                 | 150.5      | 170.6      |
| Azot Kemerovo                                 | 123.9      | 107.8      |
| Shchekinoazot                                 | 69.5       | 77.3       |
| Kazanorgsintez                                | 60.3       | 65.3       |
| Omsk Kaucuk                                   | 40.7       | 23.6       |
| Nizhnekamskneftekhim                          | 2.3        | 0.0        |
| Novokuibyshevsk Petrochemical                 | 48.8       | 49.4       |
| Zapsib  | 31.0       | 36.2       |
| SIBUR-Khimprom                                | 96.7       | 99.7       |
| Ufaorgsintez                                  | 26.3       | 10.2       |
| Uralorgsintez                                 | 58.1       | 72.9       |
| Total   | 746.2      | 812.0      |

Benzene sales on the Russian domestic market to 738,400 tons in 2021 against 742,200 tons in 2020. Angarsk Polymer Plant reduced sales from 54,500 tons to 47,000 tons whilst SIBUR-Kstovo increased sales from 79,700 tons to 86,100 tons. Uralorgsintez in the Perm region increased shipments from 84,900 tons to 90,100 tons.

Gazprom Neft at Omsk increased sales from 65,200 tons to 98,300 tons whilst Gazprom neftekhim Salavat increased from 30,100 tons to 38,600 tons. Regarding importers, Karpatneftekhim from Ukraine increased shipments to the Russian market from 5,300 tons to 18,800 tons whilst shipments from Belarus increased from 16,500 tons to 30,800 tons. At the same time shipments from the Atyrau refinery in

Kazakhstan fell from 29,600 tons to 7,100 tons due to lower aromatics production.

Russian benzene exports dropped from 96,600 tons in 2020 to 35,212 tons in 2021, due mainly to the reductions at Kirishinefteorgsintez where shipments dropped from 48,480 tons to 8,454 tons and secondly from the Novolipetsk metallurgical combine which reduced from 21,540 tons to 2,839 tons.

| Russian Caprolactam Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Kuibyshevazot                                   | 196.8      | 189.6      |
| Shchekinoazot                                   | 57.8       | 59.5       |
| SDS Azot  | 117.4      | 117.8      |
| Total   | 371.9      | 367.0      |

Amongst the consumers Kuibyshevazot reduced benzene purchases from 170,600 tons to 150,500 tons, partly due to improved technology which lowered benzene consumption in the production of caprolactam. Other caprolactam producers included Azot at Kemerovo which increased purchases from 107,800 tons to 123,900 tons and Shchekinoazot which reduced shipments from 77,300 tons to 69,500

tons.

| Russian Caprolactam Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                     | Jan-Dec 21 | Jan-Dec 20 |
| Kuibyshevazot                                | 19.3       | 53.4       |
| SDS Azot                                     | 80.7       | 101.2      |
| Shchekinoazot                                | 59.4       | 45.4       |
| Total  | 159.5      | 200.0      |

In the phenol sector Kazanorgsintez reduced purchases from 65,300 tons to 60,300 tons whilst Omsk Kaucuk increased purchases from 23,600 tons to 40,700 tons. For styrene production SIBUR-Khimprom reduced purchases from 99,700 tons to 96,700 tons.

| Russian Caprolactam Exports |            |            |            |            |
|-----------------------------|------------|------------|------------|------------|
|                             | Jan-Dec 21 |            | Jan-Dec 20 |            |
| Country                     | Kilo tons  | \$ million | Kilo tons  | \$ million |
| Belgium                     | 5.8        | 11.5       | 3.7        | 4.9        |
| China                       | 87.6       | 141.3      | 143.4      | 152.1      |
| India                       | 9.8        | 17.0       | 8.1        | 8.3        |
| Indonesia                   | 3.7        | 6.6        | 0.8        | 0.8        |
| Saudi Arabia                | 3.6        | 6.4        | 0.0        | 0.0        |
| Slovenia                    | 10.4       | 24.0       | 1.7        | 2.0        |
| Taiwan                      | 58.8       | 90.8       | 74.2       | 80.8       |
| Turkey                      | 2.1        | 3.8        | 0.0        | 0.0        |
| Vietnam                     | 13.2       | 22.3       | 1.5        | 1.5        |
| Others                      | 1.9        | 3.9        | 3.9        | 4.3        |
| Total                       | 196.7      | 327.7      | 237.3      | 254.5      |

#### Russian caprolactam production, Jan-Dec 2021

Russian caprolactam production amounted to 371,900 tons in January to December 2021 against 367,000 tons in the same period in 2020. Kuibyshevazot increased production from 189,600 tons to 196,800 tons whilst SDS Azot at Kemerovo reduced production slightly to 117,400 tons from 117,800 tons.

Russian caprolactam exports dropped from 200,000 tons in 2020 to 159,500 tons in 2021. Although Shchekinoazot increased exports from 45,400 tons to 59,400 tons, SDS Azot at Kemerovo reduced shipments from 101,200 tons to 80,700 tons and Kuibyshevazot reduced

shipments from 53,400 tons to 19,300 tons. Overall caprolactam exports dropped from 237,300 tons in 2020 to 196,700 tons in 2021. Main export markets for Russian caprolactam remain China and Taiwan

which took 87,600 tons and 58,800 tons in 2021 respectively. Revenues from caprolactam exports increased in 2021 to \$327.7 million against \$254.5 million in 2020.

| Russian Orthoxylene Domestic Sales (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Gazprom Neft  | 133.2      | 84.1       |
| Ufaneftekhim  | 35.8       | 64.8       |
| Kirishinefteorgsintez                               | 26.4       | 19.0       |
| Total   | 195.4      | 167.9      |

| Russian Orthoxylene-PA Purchases (unit-kilo tons) |            |            |
|---|------------|------------|
| Consumer  | Jan-Dec 21 | Jan-Dec 20 |
| Kamteks-Khimprom                                  | 72.1       | 55.5       |
| Gazprom neftekhim Salavat                         | 15.8       | 9.7        |
| Roshalsky Plasticizer Plant                       | 5.5        | 0.0        |
| Total   | 93.4       | 65.2       |

anhydride totalled 93,400 tons in 2021 against 65,200 tons in the same period in 2020. The newest producer Roshalsky Plasticizer Plant purchased 5,500 tons whilst the largest producer Kamteks-Khimprom increased purchases from 55,500 tons to 72,100 tons.

| Russian Toluene Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                    | Jan-Dec 21 | Jan-Dec 20 |
| Kinef                                       | 7.4        | 30.0       |
| Gazprom N Salavat                           | 34.1       | 20.9       |
| Slavneft-Yaros                              | 36.4       | 42.5       |
| LUKoil-Perm                                 | 35.7       | 28.9       |
| Gazprom Neft                                | 69.1       | 78.8       |
| RN Holding                                  | 38.0       | 45.1       |
| Ufaneftekhim                                | 34.2       | 47.4       |
| Others                                      | 18.2       | 13.6       |
| Total                                       | 272.9      | 307.3      |

71,500 tons whilst Ufaorgsintez increased production from 63,500 tons to 74,000 tons. Kazanorgsintez

| Russian Phenol Production (unit-kilo tons) |            |            |
|--|------------|------------|
| Producer                                   | Jan-Dec 21 | Jan-Dec 20 |
| Ufaorgsintez                               | 74.0       | 63.5       |
| Kazanorgsintez                             | 70.9       | 73.7       |
| Novokuibyshevsk Petrochemical              | 67.7       | 71.5       |
| Omsk Kaucuk, Omsk                          | 49.2       | 28.4       |
| Total                                      | 261.8      | 237.0      |

| Russian Domestic Market Phenol Sales by Supplier (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Omsk Kaucuk   | 38.0       | 21.4       |
| Novokuibyshevsk Petrochemical                                     | 50.8       | 58.0       |
| Ufaorgsintez  | 60.3       | 35.7       |
| Total   | 149.1      | 115.3      |

| Russian Phenol Exports by Supplier (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Omsk Kaucuk   | 17.9       | 5.8        |
| Novokuibyshevsk Petrochemical                       | 4.8        | 27.7       |
| Ufaorgsintez  | 12.6       | 0.0        |
| Total   | 35.3       | 33.4       |

### Russian orthoxylene market, Jan-Dec 2021

Orthoxylene domestic sales in Russia amounted to 195,400 tons in 2021 against 167,900 tons in 2020. Gazprom Neft increased domestic shipments from 84,100 tons to 133,200 tons whilst Ufaneftekhim reduced shipments from 64,800 tons to 35,800 tons. Orthoxylene exports from Russia totalled 37,200 tons in 2021 against 10,400 tons in 2020. Last year Kirishinefteorgsintez was the main exporter, shipping 23,600 tons.

Kirishinefteorgsintez increased domestic shipments of orthoxylene from 19,000 tons to 26,400 tons. Sales of orthoxylene for the production of phthalic

Russian toluene production totalled 272,900 tons in 2021 against 307,300 tons in 2020. Gazprom Neft reduced production from 78,800 tons to 69,100 tons whilst Ufaneftekhim reduced from 47,400 tons to 34,200 tons. Despite the fall in production sales of toluene on the merchant domestic market increased to 114,800 tons against 104,900 tons in January to December 2020.

### Russian phenol market, Jan-Dec 2021

Russian phenol production amounted to 261,800 tons in 2021 against 237,000 tons in 2020. Novokuibyshevsk Petrochemical produced 67,700 tons of phenol against 71,500 tons whilst Ufaorgsintez increased production from 63,500 tons to 74,000 tons. Kazanorgsintez reduced production slightly from 73,700 tons to 70,900 tons. Omsk Kaucuk increased production from 28,400 tons in 2020 to 49,200 tons in 2021.

Sales of phenol on the domestic market totalled 149,000 tons in 2021 against 115,300 tons in 2020 with Ufaorgsintez increasing shipments from 35,700 tons to 60,300 tons. Omsk Kaucuk increased shipments from 21,400 tons to 38,000 tons after recovering from technical problems earlier in the year whilst Novokuibyshevsk Petrochemical reduced sales from 58,000 tons to 50,800 tons. Russian phenol exports directly from producers amounted to 35,300 tons in 2021 against 33,400 tons in 2020, with Omsk Kaucuk increasing shipments from 5,800 tons to 17,900 tons.

Russian phenol export revenues increased from \$24.6 million in 2020 to \$49.0 million in 2021 with Poland serving as the largest destination taking 15,835 tons versus 8,692 tons in the previous year.

## Synthetic rubber

### Russian C4s Jan-Dec 2021

C4 rail shipments to the Russian market amounted to 496,000 tons in 2021 against 428,900 tons in 2020.

| Russian C4 Purchases (unit-kilo tons) |            |            |
|---------------------------------------|------------|------------|
| Consumer                              | Jan-Dec 21 | Jan-Dec 20 |
| Omsk Kaucuk                           | 75.3       | 97.7       |
| Nizhnekamskneftekhim                  | 208.6      | 100.5      |
| Togliattikaucuk                       | 192.5      | 211.1      |
| Sterlitamak Petrochemical Plant       | 19.6       | 17.0       |
| Total                                 | 496.0      | 426.3      |

A total of 208,600 of C4s were shipped to Nizhnekamsk against 100,500 tons in 2020 whilst Togliattikaucuk reduced purchases from 211,100 tons to 192,500 tons.

C4 imports from Azerbaijan to the Russian market increased in 2021 to 65,300 tons from 27,300 tons in 2020. Deliveries from Naftan in Belarus increased from 20,600 tons to 52,800 tons. The

| Russian Synthetic and Natural Rubber Market (unit-kilo tons) |            |            |
|--|------------|------------|
|  | Jan-Dec 21 | Jan-Dec 20 |
| Production   | 1718.0     | 1535.0     |
| Exports  | 1094.0     | 978.6      |
| Imports  | 233.6      | 200.9      |
| Supply/Demand Balance  | 857.6      | 754.3      |

largest domestic suppliers to the market included Tomskneftekhim and SIBUR-Kstovo which both sold 95,300 tons and 91,400 tons respectively in 2021. Other important domestic suppliers include Stavrolen which reduced shipments from 69,900 tons in 2020 to 66,800 tons and Kazanorgsintez which increased shipments from 40,900 tons to 44,400 tons.

### Russian rubber production and consumption Jan-Dec 2021

Russian production of synthetic rubbers amounted to 1.718 million tons in January to December 2021

| Russian Tyre Production (unit-kilo tons) |            |            |
|--|------------|------------|
| Product                                  | Jan-Dec 21 | Jan-Dec 20 |
| Car Tyres                                | 374.6      | 298.4      |
| Lorry tyres                              | 55.5       | 53.7       |
| Agricultural tyres                       | 13.3       | 13.1       |
| Total                                    | 443.5      | 365.2      |

against 1.535 million tons in the same period in 2020. Exports rose from 978,600 tons to 1.094 million tons whilst imports rose from 200,900 tons to 233,600 tons. Export revenues increased from \$1.358 million in 2020 to \$1.897 million, raising average prices from \$1388 per ton in 2020 to \$1734 million. Demand for rubber in the Russian tyre sector rose in 2021 from 365,200 tons in 2020 to 443,500 tons in 2021. Prices for

tyres last year were driven upwards by both shortages of natural rubber and high feedstock costs for synthetic rubber production.

| Russian Synthetic Rubber Exports (unit-kilo tons) |            |            |
|---|------------|------------|
| Product   | Jan-Dec 21 | Jan-Dec 20 |
| E-SBR   | 51.5       | 35.8       |
| Block   | 78.4       | 56.2       |
| SSBR  | 13.5       | 7.5        |
| SBR   | 105.8      | 129.6      |
| Polybutadiene                                     | 257.7      | 225.7      |
| Butyl rubber                                      | 113.8      | 129.9      |
| Halogenated butyl                                 | 143.1      | 124.8      |
| NBR   | 37.6       | 34.8       |
| Isoprene  | 274.6      | 218.2      |
| Others  | 17.9       | 16.1       |
| Total   | 1094.0     | 978.6      |

### Russian rubber trade Jan-Dec 2021

Russian exports of synthetic rubber totalled 1.094 million tons in 2021 against 978,600 tons in 2020. The increase in exports was enabled by the rise in production in 2021 following the economic effects of the pandemic in 2020.

Polybutadiene and isoprene exports from Russia showed large increases in volume in 2021, rising from 225,700 tons to 257,700 tons and from 218,200 tons to 274,600 tons respectively.

| Key points for Russian rubber trade 2021 vs 2020 |   |
|--|---|
| •  | Synthetic rubber exports rose from \$1.358 billion to \$1.897 million         |
| •  | Synthetic rubber exports rose from 1.535 million tons to \$1.718 million tons |
| •  | Synthetic rubber imports rose from \$158.2 million to \$230.3 million         |
| •  | Synthetic rubber imports rose from 85,349 tons to 99,299 tons                 |
| •  | Natural rubber imports rose from \$178.0 million to \$269.6 million           |
| •  | Natural rubber imports rose from 115,100 tons to 134,290 tons                 |

Exports of butyl rubber and halogenated rubber increased in 2021, with butyl exports helped by increased production at Togliattikaucuk. Natural rubber import prices into

Russia averaged \$1960 per ton in 2021 against \$1552 in 2020. The leading suppliers of natural rubber to

the Russian market include Indonesia which accounted for 54.5% of shipments in 2021 followed by Malaysia and Thailand.

| <b>Russian Synthetic Exports by Destination (unit-kilo tons)</b> |                   |                   |
|--|-------------------|-------------------|
| <b>Country</b>   | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Belarus  | 36.2              | 31.1              |
| Brazil   | 32.3              | 28.0              |
| China  | 149.0             | 211.9             |
| Czech  | 32.3              | 27.2              |
| Germany  | 37.5              | 36.8              |
| Hungary  | 48.4              | 32.9              |
| India  | 107.8             | 101.6             |
| Mexico   | 48.4              | 28.9              |
| Poland   | 122.4             | 87.8              |
| Romania  | 39.9              | 31.6              |
| Serbia   | 15.2              | 13.8              |
| Slovakia   | 38.1              | 32.9              |
| Turkey   | 93.0              | 67.2              |
| Ukraine  | 29.6              | 19.7              |
| US   | 55.8              | 32.6              |
| Others   | 208.2             | 194.5             |
| <b>Total</b>   | <b>1094.0</b>     | <b>978.6</b>      |

Regarding Russian exports of synthetic rubber, China bought 149,000 tons in 2021 against 211,900 tons in January to December 2020 whilst Poland imported 122,400 tons against 87,800 tons. India took 107,800 tons of synthetic rubber from Russia in 2021, rising from 101,600 tons in 2020. Other large buyers included Turkey which increased purchases from 67,200 tons to 93,000 tons.

#### **Nizhnekamskneftekhim rubber exports Jan-Dec 2021**

Nizhnekamskneftekhim increased production by 10.8% in 2021, including a rise in the production of rubbers from 700,00 tons to 704,000 tons.

Nizhnekamskneftekhim exported a total of 614,200 tons of synthetic rubber in 2021, up from 548,200 tons in 2020. Exports of halogenated butyl rubber increased from 124,700 tons to 137,300 tons with revenues rising from \$169.9 million to \$216.7 million. Revenues from isoprene rubber and polybutadiene exports rose from \$236.4 million to \$336.2 million and from \$165.9 million to \$284.5 million respectively.

Nizhnekamskneftekhim's revenue from the sale of synthetic rubbers for 2021 increased to \$1.079 billion against \$745.6 million for 2020.

| <b>Nizhnekamskneftekhim Rubber Exports (unit-kilo tons)</b> |                   |                   |
|---|-------------------|-------------------|
| <b>Product</b>  | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Isoprene Rubber   | 211.4             | 179.4             |
| Butyl Rubber  | 68.9              | 75.9              |
| HBR   | 137.3             | 124.7             |
| Polybutadiene   | 185.1             | 157.0             |
| Others  | 11.4              | 11.2              |
| <b>Total</b>  | <b>614.2</b>      | <b>548.2</b>      |

Nizhnekamskneftekhim aims to complete the project to increase capacity for the production of halogenated butyl rubber grades (halobutyl) by the end of 2022. Re-equipment of the plant's capacities are being designed to increase production from 150,000 tpa to 200,000 tpa. A significant amount of work has already been completed. Nizhnekamskneftekhim's butyl rubber plant currently produces butyl rubber and two types of halobutyl rubber comprising chlorobutyl rubber and bromobutyl rubber.

| <b>Nizhnekamskneftekhim Rubber Exports (\$ million)</b> |                   |                   |
|---|-------------------|-------------------|
| <b>Product</b>  | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Isoprene Rubber   | 336.2             | 236.4             |
| Butyl Rubber  | 116.8             | 101.5             |
| HBR   | 308.0             | 241.7             |
| Polybutadiene   | 284.5             | 165.9             |
| Others  | 33.1              | 14.8              |
| <b>Total</b>  | <b>1078.8</b>     | <b>745.6</b>      |

#### **Togliattikaucuk-rubber exports, Jan-Dec 2021**

Togliattikaucuk increased rubber exports from 91,900 tons in 2020 to 117,700 tons in 2021. Butyl rubber exports from Togliattikaucuk declined from 53,000 tons to 50,500 tons and isoprene rubber exports rose from 5,800 tons to 18,400 tons. SBR exports showed the largest rise in 2021 totalling 46,200 tons up from 33,000 tons in 2020, with revenues from exports rising from \$30.0 million to \$68.0 million. Overall revenues from export shipments increased for Togliattikaucuk from \$119.3 million to \$175.8 million.

| <b>Togliattikaucuk Rubber Exports (unit-kilo tons)</b> |                   |                   |
|--|-------------------|-------------------|
| <b>Product</b>   | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Isoprene Rubber  | 18.4              | 5.8               |
| Butyl Rubber   | 50.5              | 53.0              |
| SBR  | 46.2              | 33.0              |
| Others   | 2.7               | 0.2               |
| <b>Total</b>   | <b>117.7</b>      | <b>91.9</b>       |

Whilst isoprene capacity at Togliatti is rated at 90,000 tpa most of the production is used internally in the production of tyres in Tatarstan where the holding company Tatneft is based.



## Methanol

| Russian Methanol Production<br>(unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Shchekinoazot                                   | 1051.6     | 986.5      |
| Gazprom Methanol                                | 831.5      | 871.1      |
| Metafrax Chemicals                              | 1210.8     | 1154.0     |
| Akron   | 105.4      | 97.8       |
| Azot Novomoskovsk                               | 245.2      | 223.2      |
| Angarsk Petrochemical                           | 32.1       | 59.3       |
| Azot Nevinnomyssk                               | 130.8      | 125.2      |
| Tomet   | 704.7      | 760.4      |
| Ammoni  | 121.2      | 108.3      |
| Totals  | 4433.4     | 4385.7     |

| Russian Methanol Sales (unit-kilo tons) |            |            |
|---|------------|------------|
| Period                                  | Jan-Dec 21 | Jan-Dec 20 |
| Exports                                 | 1898.7     | 2125.7     |
| Domestic Sales                          | 1666.9     | 1419.4     |
| Total                                   | 3365.6     | 3545.1     |

methanol production from 108,300 tons in 2020 to 121,200 tons in 2021. The increase attributed mainly to the introduction of new owners in 2020.

## Russian methanol market overview Jan-Dec 2021

Russian methanol sales overall totalled 2.611 million tons in 2021 against 2.665 million tons and 2.657 million tons in the corresponding periods of 2020 and 2019. The major difference last year has been the rise in domestic sales and fall in exports. The main factors behind the rise in domestic sales in 2021 was the increased methanol purchases made by Nizhnekamskneftekhim and Gazprom. The main reason for the decline in export activity was the lower production and shipments at Tomet.

| Russian Methanol Export Destinations<br>(unit-kilo tons) |            |            |
|--|------------|------------|
| Country  | Jan-Dec 21 | Jan-Dec 20 |
| Belarus  | 122.2      | 114.7      |
| Finland  | 787.2      | 925.7      |
| Germany  | 2.1        | 2.1        |
| Kazakhstan   | 22.7       | 37.5       |
| Latvia   | 9.9        | 12.2       |
| Lithuania  | 83.6       | 80.1       |
| Netherlands  | 157.1      | 186.4      |
| Poland   | 328.8      | 373.8      |
| Romania  | 79.6       | 66.6       |
| Slovakia   | 202.9      | 133.9      |
| Turkey   | 6.4        | 32.4       |
| UK   | 11.7       | 54.7       |
| Ukraine  | 66.9       | 48.2       |
| Others   | 10.1       | 26.4       |
| Total  | 1893.9     | 2104.8     |

addition to the more established shippers Gazprom Methanol and Metafrax Chemicals.

Russian methanol exports to Belarus increased to 122,200 tons in 2021 from 114,700 tons in 2020. The increase in demand for methanol in Belarus was mainly driven to an increase in resin production at the Kronochem and Rechitsadrev plants. At the same time methanol exports to Kazakhstan in January-

## Russian methanol production Jan-Dec 2021

Russia produced 4.433 million tons of methanol in 2021 against 4.386 million tons in 2020. Metafrax Chemicals at Gubakha produced 1.211 million tons of methanol against 1.154 million tons in January-December 2020, whilst Gazprom Methanol at Tomsk reduced production from 871,100 tons to 831,500 tons.

Tomet produced 704,700 tons of methanol in 2021 against 760,400 tons in the same period in 2020. Production was much stronger in the second half of the year.

Shchekinoazot produced 1.052 million tons in 2021 against 988,500 tons in January to December 2020, the increase partly due to the addition of new capacity. Shchekinoazot's third methanol plant with a capacity of 500,000 tpa has produced around 130,000 tons in the first three months of operation. Assuming no major outages Shchekinoazot should become the largest methanol producer in Russia. Also, in the Tula Oblast Azot at Novomoskovsk increased production from 223,200 tons to 245,200 tons. Ammoni in Tatarstan increased

The export of methanol dropped below 2018 levels, when 1.9 million tons were exported. Last year shipments to the Black Sea Kavkaz port in the Krasnodar region were significantly reduced. At the same time Russian methanol producers reduced export shipments to the two largest destinations Finland and Poland.

## Russian methanol exports, Jan-Dec 2021

Methanol export prices from Russia averaged \$336.3 per ton in 2021 against \$181.7 across the whole of 2020. From customs reported data, Russian methanol exports totalled 1.894 million tons in 2021 against 2.105 million tons in 2020.

Exports to Finland totalled 787,200 tons in 2021 against 925,700 tons. The decline occurred despite the start by Shchekinoazot to ship product through the Finnish ports in

December 2021 decreased from 37,500 tons to 22,700 tons, due to the extended outage at the MTBE plant at the Atyrau refinery. In addition, the Uzbek methanol producer Navoiyazot significantly increased the supply of methanol to Kazakhstan in 2021 which impacted need for Russian shipments.

Poland reduced shipments from Russia from 373,800 tons in 2020 to 328,800 tons in 2021, whilst Slovakia increased volumes from 133,900 tons to 202,900 tons. Romania increased imports from Russia from 66,600 tons to 79,600 tons in 2021, whilst Ukraine increased Russian methanol imports from 48,200 tons to 66,900 tons.

| <b>Russian Methanol Exports by Producer (unit-kilo tons)</b> |                   |                   |
|--|-------------------|-------------------|
| <b>Producer</b>  | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Azot Nevinnomyssk  | 5.1               | 8.6               |
| Azot Novomoskovsk  | 85.8              | 78.5              |
| Akron  | 9.1               | 15.2              |
| Metafrax Chemicals   | 406.9             | 489.8             |
| Gazprom Methanol   | 400.0             | 487.3             |
| Tomet  | 257.8             | 318.7             |
| Shchekinoazot  | 734.0             | 722.1             |
| Ammoni   | 0.1               | 5.5               |
| <b>Total</b>   | <b>1898.7</b>     | <b>2125.7</b>     |

Russian producer exports of methanol dropped in 2021 to 1.899 million tons from 2.126 million tons in 2020. The decrease in export supplies was influenced by the prolonged stoppage of methanol production at the Tomet plant. This helped impact on product prices in Russia and the redistribution of spot volumes of methanol from other producers from export to the domestic market.

From January to December 2021, Tomet exported 257,800 tons of methanol, down from 318,700 tons in 2020. The supply of Russian methanol through Finland, the Netherlands

and Poland decreased by 21%, 46% and 15%, respectively.

Metafrax Chemicals reduced exports from 489,800 tons in 2020 to 406,900 tons in 2021 whilst Gazprom Methanol (Sibmetakhim) reduced exports from 487,300 tons to 400,000 tons. The largest Russian exporter was Shchekinoazot shipping 734,000 tons versus 722,100 tons in January to December 2020.

### Tomet's performance in 2021

As a company under bankruptcy administration, Tomet was eventually able to achieve a stable productivity of 2,600 tons of methanol per day in the second half of 2021. By optimizing the operation of both lines, it was possible to reduce natural gas costs by 9 cubic metres per ton of methanol. Revenue from the sale of methanol for 2021 amounted to 16.5 billion roubles, 1.8 times higher than in 2020. Profit from sales amounted to 8 billion roubles, which is more than 6 times higher. The net profit amounted to 5.9 billion roubles in 2021, whilst 1.77 billion roubles of taxes were paid which is 3.1 times more than in 2020.

| <b>Tomet Methanol Production and Trade 2021</b> |      |      |      |      |       |      |      |      |      |      |      |      |       |
|---|------|------|------|------|-------|------|------|------|------|------|------|------|-------|
|   | Jan  | Feb  | Mar  | Apr  | May   | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Total |
| Production                                      | 43.0 | 37.8 | 47.2 | 35.3 | 7.3   | 62.4 | 78.6 | 76.0 | 78.1 | 80.9 | 78.6 | 79.4 | 704.7 |
| Exports   | 14.3 | 10.6 | 11.7 | 11.0 | 4.6   | 22.0 | 28.1 | 30.5 | 32.4 | 32.7 | 31.2 | 28.5 | 257.8 |
| Domestic Sales                                  | 31.8 | 29.9 | 26.0 | 17.6 | 12.8  | 27.7 | 39.9 | 39.2 | 41.4 | 44.8 | 42.5 | 40.3 | 393.9 |
| Captive/Inventory                               | -3.1 | -2.7 | 9.4  | 6.7  | -10.1 | 12.7 | 10.6 | 6.2  | 4.3  | 3.4  | 4.9  | 10.6 | 53.0  |

| <b>Russian Methanol Domestic Sales (unit-kilo tons)</b> |                   |                   |
|---|-------------------|-------------------|
| <b>Producer</b>   | <b>Jan-Dec 21</b> | <b>Jan-Dec 20</b> |
| Azot Nevinnomyssk                                       | 25.3              | 16.4              |
| Azot Novomoskovsk                                       | 155.5             | 146.0             |
| Metafrax Chemicals                                      | 442.7             | 349.6             |
| Gazprom Methanol  | 387.4             | 328.0             |
| Tomet   | 393.9             | 363.4             |
| Shchekinoazot   | 192.2             | 150.8             |
| Ammoni (Mendeleevsk)                                    | 69.8              | 65.2              |
| <b>Total</b>  | <b>1666.9</b>     | <b>1419.4</b>     |

### Russian methanol domestic sales, Jan-Dec 2021

Merchant sales of methanol on the Russian domestic market amounted to 1.667 million in 2021 against 1.419 million tons in 2020. The rise in domestic consumption helped offset the decline in export activity. Despite operating one line for the part of the year Tomet's sales from the Togliatti plant increased to 393,900 tons against 363,400 tons in the previous year. Tomet's largest customer for domestic sales was Togliattiazot where methanol is used for the production of urea-formaldehyde

concentrate. Gazprom Methanol increased domestic shipments of methanol from 328,000 tons to 387,400 tons whilst Shchekinoazot increased domestic sales from 150,800 tons to 192,200 tons.

| Russian Methanol Purchases by Consumer<br>(unit-kilo tons) |            |            |
|--|------------|------------|
| Consumer   | Jan-Dec 21 | Jan-Dec 20 |
| Nizhnekamskneftekhim                                       | 315.3      | 215.3      |
| Togliattikaucuk  | 116.7      | 126.7      |
| Uralorgsintez  | 60.9       | 65.4       |
| SIBUR-Khimprom   | 21.7       | 18.5       |
| SIBUR Tobolsk  | 45.1       | 44.3       |
| Ektos-Volga  | 6.3        | 36.9       |
| Omsk Kaucuk  | 89.2       | 80.5       |
| Novokuibyshevsk NPZ  | 38.7       | 40.3       |
| Uralkhimplast  | 23.2       | 21.1       |
| Slavneft-Yanos   | 16.4       | 12.6       |
| Metadynea  | 98.4       | 79.3       |
| Kronospan  | 116.4      | 92.9       |
| Gazprom  | 206.0      | 128.9      |
| Khimsintez   | 36.3       | 19.0       |
| Volzhsky Orgsintez   | 21.3       | 10.2       |
| Others   | 454.6      | 436.5      |
| Total  | 1666.5     | 1428.3     |

Metafrax Chemicals increased shipments to the domestic market from 349,600 tons in 2021 to 442,700 tons. Metafrax supplied 191,400 tons to Nizhnekamskneftekhim which was up from 142,600 tons in 2020. The increase was due to the rise in isoprene and formaldehyde production at Nizhnekamsk. Overall Nizhnekamskneftekhim increased purchases of merchant methanol from 215,300 tons in 2020 to 315,100 tons in 2021, thus an exact rise of 100,000 tons.

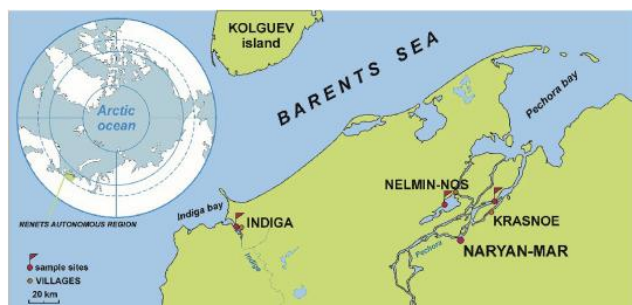
Togliattikaucuk reduced methanol purchases from 126,700 tons in January to December 2020 to 116,700 tons, the drop being mainly due to lower MTBE production. Gazprom increased purchases of methanol for gas hydrates in Siberia from 128,000 tons in 2020 to 206,000 tons in January to December 2021. Nearly all of the methanol purchases made by Gazprom come from its subsidiary Gazprom Methanol.

In the area of urea-formaldehyde resins Kronospan and Metadynea recorded higher production volumes last year which led to higher methanol purchases. Kronospan bought 116,400 tons of methanol against 82,900 tons in

2020 and Metadynea increased purchases from 79,300 tons to 98,400 tons. Uralkhimplast at Nizhniy Tagil increased methanol purchases for resin production from 21,100 tons to 23,200 tons. Concerning new tenders Gazprom neftekhim Salavat announced a tender in January for the supply of 85,205 tons of methanol for delivery over the whole of 2022 and up to March 2023. In Tatarstan TAIF-NK placed tenders for methanol in batches of 1,100 tons for 2022.

### Ruskhim-methanol project

The procedure of public hearings on the 1.8 million tpa methanol project at Indiga in the Pechora region has begun including environmental impact assessment materials. Ruskhim intends to build a gas



chemical complex for processing natural gas into methanol by 2026. The regional debate focuses on the natural gas feedstocks from the Kumzhinskoe and Korovinskoye fields, to be supplied by new pipelines. Methanol is planned to be shipped along the Northern Sea Route to Europe and Asia through the future port to be constructed at Indiga. Total investments in the construction of production and infrastructure facilities have been estimated at more than 200 billion roubles

(around \$2.5 billion). Ruskhim (50% owned by Vitaly Yuzhilin, another 25% each from Gennady Mirgorodsky and Dmitry Ozersky) acquired Pechora LNG at the end of 2020 from the Alltech group, previously owned by Dmitry Bosov (died in May 2020). Initially, on the basis of Pechora LNG, the Alltech group was going to build an LNG plant together with Rosneft. Apart from environmental issues the investors are concerned that sanctions could affect the raising of project finance.

### Nakhodka fertiliser and methanol project

Similar opposition to the Taman project on the Sea of Azov is being seen in the Primorsky Krai for the fertiliser and methanol project undergoing construction at the Kozmino bay near Nakhodka (NZMU). This project is more advanced and is provisionally scheduled for start-up in 2024, including 1.8 million tpa of methanol, 1.8 million tpa of ammonia and 3.0 million tpa of urea. Most of the production from the methanol intended to be sent to China. Environmental concerns over the fertiliser and methanol project concentrate on the dangers to the Primorsky Krai which is characterized by a symbiosis of subtropical and Siberian fauna.

| Russian N-Butanol Production (unit-kilo tons)  |            |            |
|--|------------|------------|
| Producer                                       | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Petrochemical company                  | 26.3       | 29.7       |
| Azot Nevinnomyssk                              | 15.4       | 17.2       |
| Gazprom neftekhim Salavat                      | 54.2       | 65.4       |
| SIBUR-Khimprom, Perm                           | 28.7       | 31.0       |
| Total  | 124.4      | 143.3      |
| Russian Isobutanol Production (unit-kilo tons) |            |            |
| Producer                                       | Jan-Dec 21 | Jan-Dec 20 |
| Angarsk Petrochemical Company                  | 17.3       | 20.1       |
| Gazprom neftekhim Salavat                      | 32.5       | 37.1       |
| SIBUR-Khimprom, Perm                           | 37.0       | 45.1       |
| Total  | 86.8       | 102.4      |

| Russian Butanol Consumption (unit-kilo tons) |            |            |
|--|------------|------------|
| Consumer                                     | Jan-Dec 21 | Jan-Dec 20 |
| Akrlat                                       | 15.4       | 16.0       |
| Dimitrievsky Chemical                        | 17.4       | 24.1       |
| Volzhskiy Orgsintez                          | 9.3        | 9.1        |
| Roshalsky Plant of Plasticizers              | 4.5        | 2.0        |
| Others                                       | 9.2        | 9.1        |
| Total  | 55.8       | 60.2       |

| Russian Butanol Domestic Sales (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer  | Jan-Dec 21 | Jan-Dec 20 |
| Gazprom n Salavat                               | 5.4        | 7.7        |
| SIBUR-Khimprom                                  | 21.8       | 23.6       |
| Angarsk Petrochemical                           | 38.9       | 26.5       |
| Azot Nevinnomyssk                               | 0.3        | 2.4        |
| Totals  | 66.4       | 60.2       |

tons to 41,900 tons. Acetone exports from Russia totalled 65,300 tons in 2021 against 47,700 tons in 2020.

| Russian Acetone Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Producer                                    | Jan-Dec 21 | Jan-Dec 20 |
| Ufaorgsintez                                | 46.3       | 41.2       |
| Kazanorgsintez                              | 41.9       | 48.8       |
| Novokuibyshevsk Petrochemical               | 42.0       | 47.2       |
| Omsk Kaucuk                                 | 30.5       | 19.8       |
| Total                                       | 160.6      | 157.0      |

| Russian Acetone Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Country                                  | Jan-Dec 21 | Jan-Dec 20 |
| Belarus                                  | 10.9       | 9.7        |
| Netherlands                              | 29.9       | 13.8       |
| Turkey                                   | 5.8        | 7.2        |
| Lithuania                                | 1.4        | 3.8        |
| Latvia                                   | 8.9        | 2.0        |
| Others                                   | 8.3        | 11.2       |
| Total                                    | 65.3       | 47.7       |

## Organic chemicals

### Russian butanol production Jan-Dec 2021

Russian normal butanol production fell from 143,300 tons in 2020 to 124,400 tons in 2021. Gazprom neftekhim Salavat was the largest Russian producer, reducing production to 54,200 tons against 65,400 tons in January to December 2020.

Isobutanol production in Russia dropped from 102,400 tons to 86,600 tons in 2020 during which Gazprom neftekhim Salavat reduced production from 37,100 tons to 32,500 tons, and SIBUR-Khimprom reduced from 45,100 tons to 37,000 tons.

### Russian domestic butanol sales, Jan-Dec 2021

Merchant butanol sales on the Russian domestic market amounted to 66,400 tons in 2021 against 60,200 tons in 2020. The largest supplier of butanols to the domestic merchant market came from Angarsk Petrochemical which shipped 38,900 tons against 26,500 tons in 2020.

The largest butanol buyer on the domestic market in 2021 was by Dimitrievsky Chemical Plant which increased reduced from 24,100 tons to 17,400 tons. Akrlat at Dzerzhinsk reduced purchases from 16,000 tons to 15,400 tons.

### Russian acetone market Jan-Dec 2021

Russian acetone production amounted to 160,600 tons in 2021 against 157,000 tons in 2020. Omsk Kaucuk produced 30,500 tons of acetone against 19,800 tons whilst Kazanorgsintez reduced production from 48,800 tons to 41,900 tons.

Revenues from Russian acetone exports rose from \$22.5 million in 2020 to \$45.2 million in 2021 after prices rose in accordance with higher feedstock costs. The largest market for Russian acetone exports was the Netherlands taking 29,500 tons against 13,800 tons in 2020. Belarus imported 10,900 tons of acetone from Russia in 2021 versus 9,700 tons in 2020.

### SIBUR completes construction of maleic plant

ZapSibNeftekhim has completed construction and installation work on the maleic anhydride plant at Tobolsk. Commissioning works are reported to be well advanced and were estimated at 77% by the end of January.

The capacity of the plant has been designed to produce 45,000 tpa based on Conser technology from Italy. Start-up is scheduled for the second quarter in 2022. Most of the production is intended for export activity.



### Russian trade in oxygenated solvents Jan-Dec 2021

Imports of ethyl acetate into Russia decreased by 15% in 2021 from 8,168 tons to 6,918 tons. The drop was attributed due to high prices and quotas for shipments of material from abroad. In addition, there were

| Russian Ethyl Acetate Imports (unit-kilo tons) |            |            |
|--|------------|------------|
| Company  | Jan-Dec 21 | Jan-Dec 20 |
| Laxmi Organics Industries                      | 3.6        | 4.4        |
| Ineos  | 1.3        | 1.2        |
| Rhodia Brasil                                  | 0.7        | 0.4        |
| KH Chemicals                                   | 0.3        | 0.0        |
| IOL Chemicals And Pharmaceuticals              | 0.2        | 0.8        |
| Others   | 0.8        | 1.3        |
| Total  | 6.9        | 8.2        |

sufficient volumes of product supply from a large domestic ethyl acetate plant on the market. Last year, 60% of products were delivered to Russia from India. 14% and 10% were materials from Holland and Brazil respectively.

Russian producers in 2021 increased the export of isopropyl alcohol by 3.6 times, to 13,300 tons (by \$14.2 million). At the same time, imports fell sharply, almost 2 times, to

20,700 tons (by \$28.2 million). Imports are sourced mainly from Germany and the US, whilst the main buyers included was Turkey, Belarus and Kazakhstan.

### Russian TDI-MDI Imports

| Russian TDI Imports (unit-kilo tons) |            |            |
|--------------------------------------|------------|------------|
| Country                              | Jan-Dec 21 | Jan-Dec 20 |
| Belgium                              | 1.073      | 0.486      |
| China                                | 19.423     | 5.737      |
| Germany                              | 6.677      | 12.819     |
| Hungary                              | 8.006      | 9.600      |
| Japan                                | 0.267      | 1.060      |
| Netherlands                          | 1.779      | 2.075      |
| Saudi Arabia                         | 3.264      | 7.716      |
| South Korea                          | 13.561     | 6.183      |
| US                                   | 4.375      | 2.185      |
| Others                               | 0.074      | 3.500      |
| Total                                | 59.922     | 51.965     |

### Russian TDI-MDI imports, Jan-Dec 2021

Russian TDI imports totalled to 59,922 tons in 2021 against 51,165 tons in 2020. Values of Russian TDI imports increased from a total of \$70.758 million in January to December 2020 to \$154.581 million in 2021. The main Russian regions for TDI purchased imports included Moscow and Tatarstan. Although Moscow accounted for purchases of 33.307 tons in 2021 large volumes were processed in other locations.

China was the largest supplier of TDI to Russia in 2021 shipping 19,330 tons for \$47.640 million which compares against 5,737 tons in January to December 2020 for \$8.206 million. South Korea was the second largest supplier of TDI to Russia in 2021 shipping 13,561 tons against 6,183 tons in January to December 2020.

Other important suppliers included Hungary which shipped 8,006 tons to Russia against 9,600 tons in January to December 2020 and the US which exported 4,375 tons against 2,185 tons in 2021 in 2020. TDI supplies from Germany and Saudi Arabia both declined last year, falling from 12,819 tons to 6,677 tons and from 7,716 tons to 3,264 tons respectively.

| Russian Imports of MDI (unit-kilo tons) |            |            |
|---|------------|------------|
| Country                                 | Jan-Dec 21 | Jan-Dec 20 |
| Belgium                                 | 21.331     | 13.555     |
| China                                   | 41.683     | 28.824     |
| Germany                                 | 18.877     | 18.751     |
| Hungary                                 | 4.804      | 3.131      |
| Japan                                   | 2.240      | 1.617      |
| Netherlands                             | 40.723     | 26.080     |
| Portugal                                | 4.128      | 2.429      |
| Saudi Arabia                            | 43.569     | 34.539     |
| South Korea                             | 2.642      | 1.004      |
| Others                                  | 2.285      | 0.304      |
| Total                                   | 182.596    | 130.395    |

MDI imports into Russia amounted to 182,596 tons in 2021 against 130,395 tons in 2020, with costs rising from \$225.221 million to a total of \$450.546 million. Saudi Arabia increased shipments in 2021 from 34,539 tons in 2020 to 43,569 tons whilst shipments from the Netherlands rose from 26,080 tons to 40,723 tons.

Other MDI suppliers included China which increased shipments from 28,624 tons in January to December 2020 to 41,683 tons in 2021 and Germany which increased from 18,751 tons to 18,877 tons. Belgium increased shipments from 13,555 tons to 21,331 tons. The most important region for Russian MDI imports was the Vladimir Oblast which accounted for purchases of 70,859 tons in 2021 for costs of \$159.401 million. The next largest regions

included Moscow where volumes amounted to 34,718 tons for \$101.820 million and the Kaluga Oblast which bought 27,243 tons for \$50.753 million. Tatarstan took 10,607 tons in 2021 for \$29.948 million.

| Russian Imports of MDI by Region (Jan-Dec 2021) |             |                |
|---|-------------|----------------|
| Region  | Vol (ktons) | Value (\$ mil) |
| Kaluga  | 27.2        | 50.8           |
| Moscow  | 34.7        | 101.8          |
| Moscow Oblast                                   | 11.8        | 33.8           |
| Vladimir  | 70.9        | 159.4          |
| Tatarstan                                       | 10.6        | 19.2           |
| Others  | 27.5        | 85.5           |
| Total   | 182.7       | 450.5          |

Regarding export activity Russia shipped 7,689 tons of MDI out in 2021 of which Belarus took 3,307 tons and the remainder delivered mostly to neighbouring states. TDI exports totalled 1,637 tons in 2021.

#### Russian isocyanate import costs Jan-Dec 2021

TDI costs for Russian importers averaged \$2583 per ton in 2021 against \$1689 in 2020. Import costs overall rose from \$70.758 million to \$154.597 million in 2021. The outlook for crude oil prices either short term or medium term suggest that TDI prices are more likely to rise from 2021 levels.

MDI costs per ton for Russian imports rose from \$1386 in 2020 to \$2430 in 2021. Overall, for 2021 import costs for MDI shipments totalled \$450.546 million against \$225.361 million in 2020. Imports from China increased from \$46.342 million to \$120.765 million followed by imports from Saudi Arabia rising from \$49.817 million to \$101.680 million.

## Ukraine

#### Ukrainian polymer trade Jan-Dec 2021

PVC imports into Ukraine decreased by 20% in 2021 to 26,700 tons against 33,400 tons in 2020. Limited export quotas from European and North American producers were the main reason for the drop

| Ukrainian Polymer Imports (unit-kilo tons) |            |            |
|--|------------|------------|
| Product                                    | Jan-Dec 21 | Jan-Dec 20 |
| PVC  | 26.7       | 33.4       |
| LDPE                                       | 86.3       | 79.3       |
| LLDPE                                      | 81.3       | 75.3       |
| HDPE                                       | 90.7       | 97.3       |
| Ethylene Vinyl Acetate                     | 14.7       | 10.6       |
| PP   | 99.5       | 101.2      |

in imports combined with stable production at Karpatneftekhim. The key suppliers of resin to the Ukrainian market during 2021 were producers from Europe; their share in total imports amounted to about 88%.

Export sales of Ukrainian PVC increased by 23% over 2020, with the largest export volumes sent to Turkey. Karpatneftekhim increased exports to 191,700 tons of PVC were shipped for export against 155,300 tons in

2020.

Imports of polyethylene to the Ukrainian market rose 4% in 2021 to a total of 277,300 tons against 265,900 tons in 2020. HDPE imports amounted to 90,700 tons against 97,300 tons in 2020, whilst LDPE imports increased from 79,300 tons to 86,300 tons. LLDPE imports increased from 75,300 tons to 81,800 tons. Imports of other types of polyethylene, including ethylene-vinyl-acetate (EVA) amounted to 18,500 tons against 13,400 tons.

Polypropylene imports into the Ukrainian market amounted to 99,500 tons in 2021 against 101,200 tons in 2020. Homopolymer imports dropped 2% to 74,500 tons, whilst block copolymer imports dropped from 10,500 tons to 9,800 tons. Imports of random copolymers rose from 11,800 tons to 12,600 tons.

| Karpatneftekhim Production (unit-kilo tons) |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|
| Product                                     | Q1 21 | Q2 21 | Q3 21 | Q4 21 | Total |
| Ethylene                                    | 57.3  | 57.7  | 44.8  | 64.4  | 224.3 |
| Propylene                                   | 28.1  | 25.2  | 29.4  | 28.2  | 110.8 |
| Benzene                                     | 27.3  | 19.5  | 15.1  | 27.8  | 89.7  |

#### Karpatneftekhim-production and trade Jan-Dec 2021

In 2021 Karpatneftekhim produced 224,300 tons of ethylene, 110,800 tons of propylene and 89,700 tons of benzene. Production at Kalush was only halted for a short maintenance outage in the third quarter.

| Karpatneftekhim Petrochemical Exports (unit-kilo tons) |            |            |
|--|------------|------------|
| Product  | Jan-Dec 21 | Jan-Dec 20 |
| Propylene  | 104.0      | 101.0      |
| Benzene  | 88.0       | 63.1       |

Karpatneftekhim increased exports of propylene in 2020 from 101,000 tons to 104,000 tons, whilst benzene exports rose from 63,100 tons to 88,000 tons. The largest share of propylene shipments was exported to Poland. Karpatneftekhim encountered several stoppages last year due

the high cost of raw materials combined with low prices for polyethylene. Feedstock issues this year could arise from the escalation of the military conflict in eastern Ukraine and potential Russian invasion.

### Ukrainian methanol market Jan-Dec 2021

Ukrainian methanol imports totalled 86,400 tons in 2021 against 77,700 tons in 2020. In addition to Russian producers Metafrax and Shchekinoazot, Centro Chem from Poland and Vivochem from the Netherlands also provided supplies in 2021. For supplies of formalin, urea-formaldehyde concentrate and urea-

| Ukrainian methanol imports (unit-kilo tons) |             |
|---|-------------|
| Period                                      | Vol (ktons) |
| Jan-Dec 21                                  | 86.4        |
| Jan-Dec 20                                  | 77.7        |
| Jan-Dec 19                                  | 58.2        |

formaldehyde resins, Ukraine imports from a number of countries including Poland, Belarus, Romania and Slovakia.

The major consumers of methanol in Ukraine include Ukratnafta for use in fuels, Ukrgasvydobuvannya in gas supply and KarpatSmol in resin manufacture. Imports of paint and varnish solvents to Ukraine in 2021 increased by 86% to 132,000 tons. Solvents using products such as

methanol, toluene, orthoxylene, butanols and acetone are subject to excise duty at a rate of €245 per ton.

| Ukrainian Plasticizer Imports (unit-tons) |            |            |
|---|------------|------------|
| Product/Company                           | Jan-Dec 21 | Jan-Dec 20 |
| <b>DOP</b>                                | 3046.0     | 2256.0     |
| Boryszew                                  | 2000.0     | 1974.9     |
| DEZA                                      | 208.0      | 149.0      |
| Other                                     | 205.0      | 43.2       |
| <b>DOTP</b>                               | 2321.0     | 3453.0     |
| Grupa Azoty                               | 958.0      | 891.7      |
| Boryszew                                  | 544.0      | 750.4      |
| SIBUR-Khimprom                            | 223.0      | 1196.9     |
| Others                                    | 578.0      | 614.0      |
| <b>DINP</b>                               | 13340.0    | 11329.1    |
| BASF                                      | 970.0      | 1755.7     |
| DEZA                                      | 3019.0     | 3538.3     |
| Exxon Mobil                               | 5702.0     | 7058.9     |
| KH Chemicals BV                           | 24.0       | 976.9      |
| Other                                     | 1470.0     | 1363.5     |

### Ukrainian plasticizer imports, Jan-Dec 2021

Ukraine increased imports of DOP from 2,256 tons in 2020 to 3,046 tons in 2021, whilst DOTP imports dropped from 3,453 tons to 2,321 tons and DINP dropped from 11,329 tons to 13,340 tons. The largest suppliers of DOP and DOTP were from Poland, Boryszew and Grupa Azoty respectively whilst the largest suppliers of DINP included Exxon Mobil and Deza from the Czech Republic.

### Crimean Soda production 2021

The Crimean Soda plant (Krasnoperekopsk, Crimea) increased the production of soda ash by 29.9% in 2021 compared to 2020, up to 515,500 tons. The production of soda ash of grade "A" increased by 28.3%, to 370,800 tons. The increase is due to the low base in 2020 when repair work and modernisation were carried out. In 2020 the company produced 396,800 tons of soda ash. The volume of production of baking soda (sodium bicarbonate) last year increased by 0.8%, to 27,400 tons. The production of edible salt decreased by 18.8% to

21,300 tons. The design capacity of the enterprise is 698,000 tpa.

## Central Asia

### Azerbaijan-chemical trade 2021

Azerbaijan exported 744,646 tons of chemical products in 2021, which is 29% higher than in 2020. Export of chemical products from Azerbaijan amounted to \$245.4 million (an increase of 2.9 times). The share of chemical products in the total volume of exports for Azerbaijan amounted to 1.11% overall and in the structure of non-oil exports 9.05%. Exports of nitrogen fertilisers from Azerbaijan in 2021 amounted to

| Azerbaijan Chemical Production (unit-kilo tons) |            |            |
|---|------------|------------|
| Product   | Jan-Dec 21 | Jan-Dec 20 |
| Ethylene  | 164.7      | 102.4      |
| Propylene                                       | 146.4      | 103.3      |
| Methanol  | 378.2      | 476.6      |

322,567 tons, 4.5 times greater than in 2020, for \$118.5 million which was 11 times higher. Fertilisers are produced at the SOCAR Carbamide Plant, which was put into operation in January 2019.

### Azerbaijan-petrochemical production 2021

Azerkhiymya increased the production of ethylene in 2021 by 64.9% and propylene by 47.7% over 2020 to 164,700 tons and 146,400 tons respectively. The increase in production was facilitated after the modernisation of the plant, which was completed in February 2021. Capacities have increased for ethylene from 100-20,000 tpa to 192,000 tpa, and propylene from 80-90,000 tpa to 187,000 tpa.

**SOCAR Methanol 2021**

SOCAR Methanol reduced the production of methanol by 20.6% in 2021 compared to 2020, falling to 378,200 tons. All of the production was undertaken in the period from May to December, with major maintenance having been undertaken January and April. Methanol revenues in 2021 totalled \$90.1 million in 2021 which was 76% up on 2020.

**Kazakh methanol purchases 2021-2022**

Methanol shipments from Russia in 2021 amounted to 26,000 tons against 37,500 tons in 2020. Volumes are expected to be higher this year due to extra purchasing at the Atyrau refinery. At the end of 2021 the refinery placed tenders for supply until the end of 2022 of 13,991 tons for delivery in batches of 520 tons.

**Uzbekistan-reagent investments**

Uzbekneftegaz plans to organise the production of new types of products such as diethyl enamine and methylethyleneamine together with the Russian

company Sintez OKA. Chemical reagents developed by the company Sintez OKA are already used in oil and gas production departments and processing enterprises of Uzbekneftegaz. An agreement was reached to accelerate the work on technical testing of products developed by Sintez OKA for the project of gas purification from mercaptan compounds at the Mubarek Gas Processing Plant.

**Shurtan Gas Chemical Complex production 2021**

Shurtan Gas Chemical Complex processed 4.174 billion cubic metres of natural gas in 2021 and 135,200 tons of polyethylene. The plant generated exports of \$5.599 million in 2021, up 19.6% on pre year forecasts.

**Uzbekneftegaz GTL-Linear Alkylbenzene project**

For the GTL plant at Shurtan Uzbekneftegaz has signed a preliminary deal with Honeywell UOP on a project to produce linear alkylbenzenes. Under the memorandum of understanding (MoU), the plant will produce up 100,000 tpa of linear alkylbenzenes (LABs) using a by-product of kerosene production. Uzbekistan launched its first gas-to-liquids (GTL) plant in a \$3.6 billion project to extract value from domestically produced natural gas.

**Kazakh polypropylene plant completion**

KazMunayGaz has completed the main construction at the gas chemical complex of Kazakhstan Petrochemical Industries Inc. (KPI) in the Atyrau region. After commissioning, the 500,000 tpa plant will produce more than 65 different grades of polypropylene.

**SIBUR-petrochemical projects in Kazakhstan**

SIBUR, Samruk-Kazyna and KazMunayGaz signed agreements in October regarding the basic terms of cooperation on petrochemical projects at Atyrau. In particular, SIBUR is interested in replacing Borealis which dropped out of the 800,000 tpa polyethylene project in 2019 at Atyrau of 1.25 million tpa, as well as taking a share in the polypropylene plant which is close to completion with a capacity of 500,000 tpa.

On 27 December the new plant received the first batch of propane from the Tengiz field after receiving nitrogen and dry compressed air in November. The raw material propane is delivered to the site of the complex by rail in tank cars. On average, 72 cars with a total volume of 2,300 tons are merged per day. Tengizchevroil will supply 550,000 tpa by rail. At the plant, the raw materials will be processed at the propane dehydration unit to obtain propylene, and then at the polymerisation unit will receive granular polypropylene.

**Kazakh Polymer Imports (unit-kilo tons)**

| Polymer | Jan-Dec 21 | Jan-Dec 20 |
|---------|------------|------------|
| HDPE    | 133.1      | 141.1      |
| LDPE    | 22.9       | 22.1       |
| LLDPE   | 11.3       | 12.1       |
| PP      | 43.3       | 42.0       |
| LLDPE   | 11.4       | 11.5       |

**Kazakh paraxylene production and PTA-PET projects**

Kazakhstan reduced paraxylene production in 2021 due to arrange of problems including electricity supply to the Atyrau refinery for a period combined with a refocusing of refining operations towards the fuel sector. Paraxylene production therefore dropped from 185,000 tons in 2020 to around 82,000 tons in 2021.

Provisional forecasts for 2022 suggest production levels of 150-200,000 tons. The capacity of the paraxylene plant at Atyrau comprises 496,000 tpa, although utilisation has not exceeded 50% until now. Projects for PTA and PET are under consideration at Atyrau including capacities for both projects up to 1.25 million tpa. KazMunayGaz states that negotiations on joint implementation with a potential investor are at the final stage and all project documentation has been developed.



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