

# SIBUR

## SIBUR leaps onto world stage





## SIBUR's leap onto the world stage



**ZAPSIB:** SIBUR's transformational \$8.8-billion petrochemicals project at Tobolsk, Russia, is propelling the company into the top tier of global producers.

**S**IBUR (Moscow), the leading petrochemicals producer in Russia and the CIS, has launched its transformational \$8.8-billion ZapSibNeftekhim (ZapSib) petchems project at Tobolsk in Western Siberia. The complex sits close to abundant oil and gas reserves, providing associated petroleum gas (APG) and natural gas liquids (NGLs) feedstock at prices similar to those enjoyed by low-cost producers in the Middle East and North America.

ZapSib is based on a steam cracker with capacity for 1.5-million metric tons/year (MMt/y) of ethylene and 500,000 metric tons/year of propylene. It is the first greenfield steam cracker to be built in Russia since the Soviet era and by far the largest in the country. It will add to SIBUR's existing, much smaller steam crackers at Kstovo and Tomsk, which together have a capacity of about 700,000 metric tons/year of ethylene.

ZapSib is designed to crack 2.7 MMt/y of liquefied petroleum gas (LPG)—butane and propane—and 300,000–400,000 metric tons/year of ethane. The complex also includes plants designed to produce 1.5

MMt/y of polyethylene (PE) and 500,000 metric tons/year polypropylene (PP), more than tripling the company's polyolefins capacity. The PE units will further widen SIBUR's PE product slate by introducing linear low-density polyethylene (LLDPE) and high-to-linear low-density polyethylene.

SIBUR is now underway with another, even larger, petchems project, the Amur gas-chemical complex at Blagoveshchensk in Russia's Far East. This complex will be built in a joint venture (JV) with China's Sinopec and be completed in 2024-25 to coincide with the completion of a nearby gas-processing facility owned by Gazprom. A final investment decision to proceed with the Amur project has been made and an official ceremony to mark the start of the project took place in August 2020.

SIBUR is one of the world's most profitable and fastest growing petrochemical companies. It ranks in the top five businesses for volume of investments, is successfully implementing a number of large-scale investment projects aimed at further enhancing its customer proposition, and has a long-term development strategy in place.

SIBUR's place in the global PE industry is also set to soar. In 2018, it was in 10th place by capacity in Europe but when ZapSib is fully running by the end of 2020, it is expected to move up the leader board. When the Amur complex is completed in the middle of the decade, SIBUR could become one of Europe's leading PE and PP producers.

Today the company is already the top producer in Russia of PP, biaxially-oriented polypropylene (BOPP), LDPE, polyethylene terephthalate (PET) resin, ethylene glycol, expandable polystyrene (EPS), styrene-butadiene rubber, polybutadiene rubber, and styrene-butadiene-styrene.

SIBUR's management team has a track record of value creation and transparent corporate governance. Top executives, led by Dmitry Konov, have clear accountability and are compensated according to the company's performance versus its peers. In June 2019, the international credit ratings agency Fitch upgraded SIBUR's rating from BB+ to BBB- with stable outlook, promoting the company's debt into an investment-grade category. S&P also has SIBUR on BBB-, while Moody's has a Baa3, with stable outlook, rating on the company.

In 2018, the company revised its articles of association to vest its top management into two single-member executive bodies. Konov is the chairman of the management board of SIBUR Holding PJSC and Mikhail Karisalov, formerly COO of SIBUR, is management board member and CEO of its management organization, SIBUR LLC. The move is designed to separate strategic and operational management to enhance efficiency.

Under Konov's management, SIBUR pruned its portfolio to concentrate on core petrochemical assets. It sold its tire and fertilizer operations and more recently divested its assets at Togliatti—including plants producing butadiene, isoprene, various types of synthetic rubber, methyl tert-butyl ether (MTBE), and other intermediates—to Tatneft. SIBUR has also been active in acquisitions, having bought BIAXPLEN, a leading Russian producer of BOPP, and increased its ownership in Poliom, an Omsk-based PP producer. SIBUR and Gazprom Neft acquired a combined 50% stake in Poliom last year from the Titan Group as well as its 210,000-metric tons/year PP plant, making the Poliom-operated Neftekhimiya facility located at Gazprom Neft's refinery in Moscow an equally owned JV of SIBUR and Gazprom Neft.

In 2013, the company completed its first major world-scale project at Tobolsk, a propane dehydrogenation and PP complex, with capacity for 500,000 metric tons/year each of propylene and PP. It has proven to be a highly profitable investment, with an EBITDA margin at the PP plant exceeding 40%. This was followed by the commissioning of RusVinyl, a 330,000-metric tons/year polyvinyl chloride (PVC) complex at Kstovo in a JV with Solvay.

SIBUR's operations are grouped under three integrated segments: midstream, which includes LPG and naphtha; olefins and polyolefins, including PE, PP, and derivatives; and plastics, elastomers, and intermediates including PET, glycols, EPS, alcohols, elastomers, MTBE and fuel additives, and intermediates and other chemicals such as purified terephthalic acid (PTA). In the first nine months of 2020, olefins and polyolefins accounted for 35% of sales, plastics, elastomers, and intermediates 23%, midstream 31%, and others 11%. The geographic sales split was dominated by Russia with 60% of the total, the CIS 4%, Europe 28%, Asia 7%, and others 1%.

Konov is upbeat about SIBUR's prospects.

"We are a low-cost producer, even by global standards. Our core operations are in Western Siberia, one of the world's hydrocarbon-rich regions, with very low energy costs. The close proximity of our production assets to our feedstock base means we can eliminate a significant proportion of costs related to transportation of LPG and naphtha and bring down our production costs to a level well below that of most of our competitors."

Konov is also pleased with the expected change in the company's product mix, with the share of midstream products expected to drop after ZapSib is fully onstream. "The end products of our midstream business—LPG and naphtha—are both feedstocks for petrochemicals production, which means that these two businesses compensate one another in terms of spreads and margins, since they operate on an arm's-length basis. And while energy markets and the midstream spread have been volatile, the spread across key petrochemical products tends to be stable in the long run," Konov says.

The Amur project is a further opportunity to expand the company's petchems operations by leveraging Gazprom's midstream infrastructure in Eastern Siberia, Konov says. "Amur will be another major growth story as it will allow us to tap ethane as a feedstock and to expand exports to Asia, a

structurally undersupplied region where we currently sell only 7% of our products."

On the last mile of the "Power of Siberia" pipeline, which pipes gas from the Irkutsk and Yakutia production hubs to consumers in Russia's Far East and China, Gazprom is building a gas-processing plant (GPP) and infrastructure. SIBUR is pleased to be working closely with its long-term partner Gazprom, which has built advanced infrastructure in the Amur region.

SIBUR and Gazprom have signed a feedstock deal covering the Amur project. Under the terms of the agreement, SIBUR will source 1.5 MMt/y of LPG and more than 2 MMt/y of ethane to feed the proposed complex, which will include a steam cracker with capacity to produce

2.3 MMt/y of ethylene and 400,000 metric tons/year of propylene feeding downstream units designed to produce 2.3 MMt/y of PE and 400,000 metric tons/year of PP. Sinopec has agreed to take a 40% stake in the project and is expected to play a major role in selling product from the complex in China.

While SIBUR's olefins and polyolefins operations are expanding apace, its plastics, elastomers, and intermediates business will experience more modest growth, concentrating on niche import-substitution projects. SIBUR was formerly one of Russia's top synthetic rubber producers, but the sale



**KONOV:** Upbeat about low-cost producer SIBUR's prospects.



**GROWTH OPPORTUNITY:** Site work is underway at the Amur gas-chemical complex in Russia's Far East, with the plant to be operational by 2024/2025.





**PRODUCTION CONTINUITY:** SIBUR's manufacturing facilities have performed flawlessly throughout the COVID-19 pandemic, with remote working arrangements having no impact on operations.

of its Togliatti site has reduced its exposure to commodity rubbers.

Going forward, the company will grow its rubber business in JV partnerships. One example is the recently commissioned 120,000-metric tons/year butyl rubber plant of Reliance SIBUR Elastomers, a JV with Reliance Industries at Jamnagar, India

SIBUR is partnering with Sinopec to build a 50,000-metric tons/year nitrile-butadiene rubber plant at the Shanghai chemical industry park at Caojing, China. Sinopec also has a minority share in SIBUR's synthetic rubber plant at Krasnoyarsk, Russia.

SIBUR, meanwhile, has been diversifying into niche products that are in high demand on the international and domestic market, including thermoplastic elastomers, maleic anhydride (MA), PTA, dioctyl terephthalate plasticizer (DOTP), and, in the future, propylene oxide.

It also completed a 100,000-metric tons/year DOTP plant at Perm that will supply 60% of its output to Russian customers, with the rest destined for export.

SIBUR is also building Russia's first MA plant at Tobolsk, with capacity for 45,000 metric tons/year and due onstream by the end of 2021 or early 2022.

### Sustainable development and COVID-19

Throughout the COVID-19 pandemic, SIBUR has been responding with consistent and proactive action. It has placed major emphasis on protecting its employees and partners, while maintaining the highest level of customer service and meeting heightened demand for materials used in medical products and safe packaging. In response to market changes during the pandemic, SIBUR increased sales of polypropylene for the production of medical personal protective equipment (PPE) and developed new grades of PE for production of medical packaging. By the end of 2020, SIBUR's Krasnoyarsk site plans to start commercial production of synthetic nitrile butadiene rubber (NBR) latex with an annual capacity of 3,500 metric tons. The project aims to develop a feedstock base for import substitution of technical and diagnostic exam (including medical) through localizing production in Russia.

A center was established to coordinate measures to fight COVID-19, including comprehensive monitoring as well as interaction with government agencies, and a response strategy developed by the Committee for Ecology, Sustainable Development, and Social Investments. SIBUR was one of the first Russian businesses to introduce a

list of preventive measures to protect the health and safety of its people.

As a responsible employer, it also put in place regulations and algorithms to minimize the risks of the virus spreading among its office and administrative staff. SIBUR complies with all sanitary standards, carries out mandatory disinfection procedures, and has a hybrid arrangement in place allowing some employees to work daily from the office while others can work remotely. It also shifted all employees at its corporate office in Moscow and administrative and management staff elsewhere to a four-day week.

Other measures include random testing for returning employees, a floating working schedule with staggered hours to prevent crowding, business meetings recommended to be held via videoconferencing, and employees having regular temperature checks at offices and being provided with PPE.

As a supplier to Russia's strategically important industries, maintaining production continuity has been crucial throughout the pandemic. SIBUR has delivered on all its contractual obligations, with remote working arrangements having no impact on its operations and full control being maintained over all its production processes.

SIBUR's production employees—who make up about 75% of its total headcount—have worked at its facilities throughout. All sites have enforced stricter sanitary and personal hygiene rules, including testing for COVID-19 and temperature checks, with all premises equipped with air purifiers and additional disinfectants being used. All employees have been provided with PPE and social distancing is practised.

For those employees engaged in continuous production, SIBUR introduced a shift-camp work model, in line with medical guidance. Before joining a two-week shift, all staff members were tested for COVID-19, and all who tested negative were isolated by consent from the outside world to live and work in a special on-site safety environment, which included dormitories, canteens, convenience stores, recreational areas, and first-aid posts.

The pandemic has also not impaired sustainability objectives in any way, SIBUR says, with the company continuing to prioritize projects that support a circular economy and aiming to improve consistently its sustainable development performance.

## World-scale projects drive transition to petrochemicals, basic polymers

**LARGE SCALE:** ZapSib establishes SIBUR as the top player in petrochemicals in Russia.



Two large-scale petrochemical and basic-polymer projects are transforming SIBUR's business and market positions, as well as fundamentally changing the Russian market and the country's overall export capabilities. The first project, ZapSib-Neftekhim (ZapSib), in Tobolsk, Western Siberia, came onstream at the end of last year and has almost reached its design capacity. Construction on the second project, the Amur gas-chemical complex (GCC), in Blagoveshchensk, in Russia's Far East, began in August. The Amur GCC, following on from ZapSib, will be another major exporter of basic polymers.

The Amur project will be located very near the border with China. "We look first at domestic demand, but Russia has a population of no more than 150 million people, so we inevitably look at geographically close export markets," says Pavel Lyakhovich, managing director and head of the Basic Polymers Division at SIBUR.

Both facilities also have access to feedstocks, with ZapSib using SIBUR's unique feedstock base in Western Siberia and Gazprom delivering raw materials to Amur. "The key challenge for every commodity chemicals company is to avoid the 'wrong' supply-and-demand balance," Lyakhovich says. "To avoid

this, we try to keep our asset base well on the safe side of the cost curve. We have always kept in mind that we wanted to be truly a petrochemical company, and with ZapSib reaching its capacity we will start utilizing two thirds of our midstream products internally." ZapSib receives liquefied petroleum gas (LPG) feedstock, which will reduce SIBUR's LPG exports by about 2.7 million metric tons/year (MMt/y), Lyakhovich says.

Industry experts say that integration and location are big advantages for ZapSib. "SIBUR is a highly integrated petrochemical producer with strategically positioned assets," says John Page, global leader for chemical industry consulting at IHS Markit. "Tobolsk is positioned to the south of some of the largest oil and gas fields in Russia."

The natural gas liquids from these fields, sourced from associated petroleum gas at SIBUR's gas-processing plants (GPPs), are transported by pipeline to Tobolsk for processing into LPG at gas-fractionating units. The LPG is then shipped via rail to SIBUR's customers in Russia and to the Ust-Luga

export terminal near St. Petersburg and to other destinations. Product is shipped from Ust-Luga mainly to northwestern Europe.

"Due to the long distances involved and the cost of returning the empty LPG rail cars back to Tobolsk, the value of the LPG feedstock in Tobolsk is highly advantaged compared with coastal steam crackers in Western Europe," says Page. "This significant feedstock cost advantage is key to offsetting the higher capital cost and complexity of building major facilities in a remote location like Tobolsk, as well as the cost of shipping the polyolefins to export markets. Once ZapSib is fully loaded, SIBUR will have an impressive proven track record of delivering these highly complex major projects in remote locations, and the

ZapSib facility should deliver SIBUR a long-standing competitive cost position similar to that seen by some producers in the Middle East."

ZapSib will triple SIBUR's polyolefins capacity. The complex will increase the share of petrochemicals in the company's portfolio from 50% to 70%. "We expect that with the growth of polyethylene [PE] and polypropylene [PP] output, as ZapSib reaches its design capacity, the company will retain its profit margins," Lyakhovich says.

The complex makes SIBUR the market leader in petrochemicals in Russia and the CIS countries. It is now able to satisfy the country's forecast demand for most polyolefins. Most of ZapSib's output will be sold overseas, however. "We plan to export about 60% of ZapSib's PP and PE volumes to Europe, Turkey, and Asia," Lyakhovich says. "Our exports of PE may reach 900,000 metric tons/year and PP exports 300,000 metric tons/year, but that will also depend on how the Russian market performs. One of our main objectives is to develop the Russian consumer market through consumer support and joint incentive programs."

Lyakhovich notes that Europe and China have big deficits in polyolefins and that Turkey's import requirements are growing rapidly. He sees ZapSib as an opportunity for SIBUR to make inroads into those markets.



**LYAKHOVICH:** China is becoming a key export market.





**LOOKING OVERSEAS:** The majority of the polyolefins manufactured at Tobolsk will be exported.

ZapSib has performed strongly since it started up. The complex's average PE and PP plant utilization rate was 65% in the first half of 2020. A two-week maintenance turnaround in June for debottlenecking resulted in the facility achieving a utilization rate of 80% in July. "We hope to achieve a 90% operating rate by the end of the year," Lyakhovich says.

Robust demand for PP and PE in packaging, FMCG, and medical applications has supported sales of ZapSib's products during the COVID-19 pandemic, SIBUR says. The company adds that its geographical position helped it to redirect polyolefin deliveries during lockdown from the EU to Asian markets, mostly China. "We diverted volumes to China as Europe slowed down due to the pandemic," Lyakhovich says.

SIBUR has also explored new routes for polymer supplies to China, leveraged on rail transportation via Kazakhstan. The company previously supplied China by sea but says transport costs are 10% lower by rail. "We found we could be competitive in northeastern China by rail," Lyakhovich says. "That allowed us to start deliveries by land. We can get higher netbacks in those areas of China."

Shipments by rail also enable SIBUR to deliver products to some Chinese customers faster than by sea, and expand the company's customer base in central and western China. Sinopec, a 10% shareholder in SIBUR, has agreed to assist SIBUR with distribution and marketing of ZapSib's PE in China.

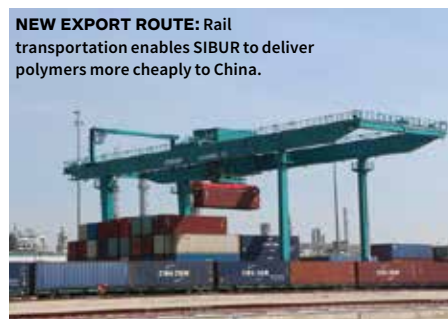
ZapSib has already produced over 1.5 million metric tons (MMT) of PE and PP since its launch. This enabled an increase in SIBUR's overall PP sales of 60.8% to 826,700 metric tons and a more than doubling of its PE sales to 920,200 metric tons in the first nine months of 2020. Since ZapSib's launch SIBUR has produced a combined 1.5 MMT of PE and PP.

Apart from polymers, SIBUR exports to China rubbers and organic synthesis products. "China is going to become one of our key

export markets and one where we see considerable potential for growth," Lyakhovich says. Two grades of ZapSib's PE are tailored to the specific requirements of the Chinese market. These are PE grades for multilayer flexible packaging and stretch films.

The Amur GCC is set to be even bigger than ZapSib. Its estimated cost increased to \$10–11 billion after SIBUR decided last year to extend the project's configuration. The Amur facility's overall production will be 700,000 metric tons/year higher than ZapSib's. The extension was enabled by a provisional agreement with Gazprom last fall, under which the company will additionally supply 1.5 MMt/y of LPG and ethane fraction to the Amur GCC.

Foundation work started on the Amur project in August following a virtual ceremony attended by Russian prime minister Mikhail Mishustin, who called it "one of Russia's biggest investment projects."



**NEW EXPORT ROUTE:** Rail transportation enables SIBUR to deliver polymers more cheaply to China.

Lyakhovich says that start-up of the Amur GCC should coincide with completion of the fourth phase of Gazprom's Amur GPP, which will supply the feedstock. The entire Gazprom facility will be Russia's largest GPP, with a capacity of 42 billion cubic meters/year, including ethane, propane, and butane. It will ultimately have six processing lines, with the first two to be commissioned in 2021. "The preliminary plan is for the Amur GCC to be launched in synch with the commissioning of the fourth stage of Gazprom's Amur GPP," Lyakhovich says. "The tentative time frame is 2024, not earlier."

The Amur project is waiting for regulatory approval in Russia. In China, it is waiting for Sinopec to join. SIBUR signed a shareholder agreement in June with Sinopec, which is expected to take a 40% stake in the project.

Linde is the ethylene plant licensor and EPSS contractor for the Amur project—the company worked on ZapSib. Chevron Phillips Chemical and Univation Technologies will be the licensors for the PE units, and

LyondellBasell for the PP plants. A consortium led by Maire Tecnimont and including MT Russia and Sinopec Engineering was earlier this year awarded a contract to build the complex. Meanwhile, SIBUR plans to engage NIPigaspererabotka as an EPC contractor for off-site facilities similar to those it built for ZapSib.

Sinopec will also share some costs. "We will split financing costs in proportion to our stakes," Lyakhovich says. "Some elements of project financing are possible too."

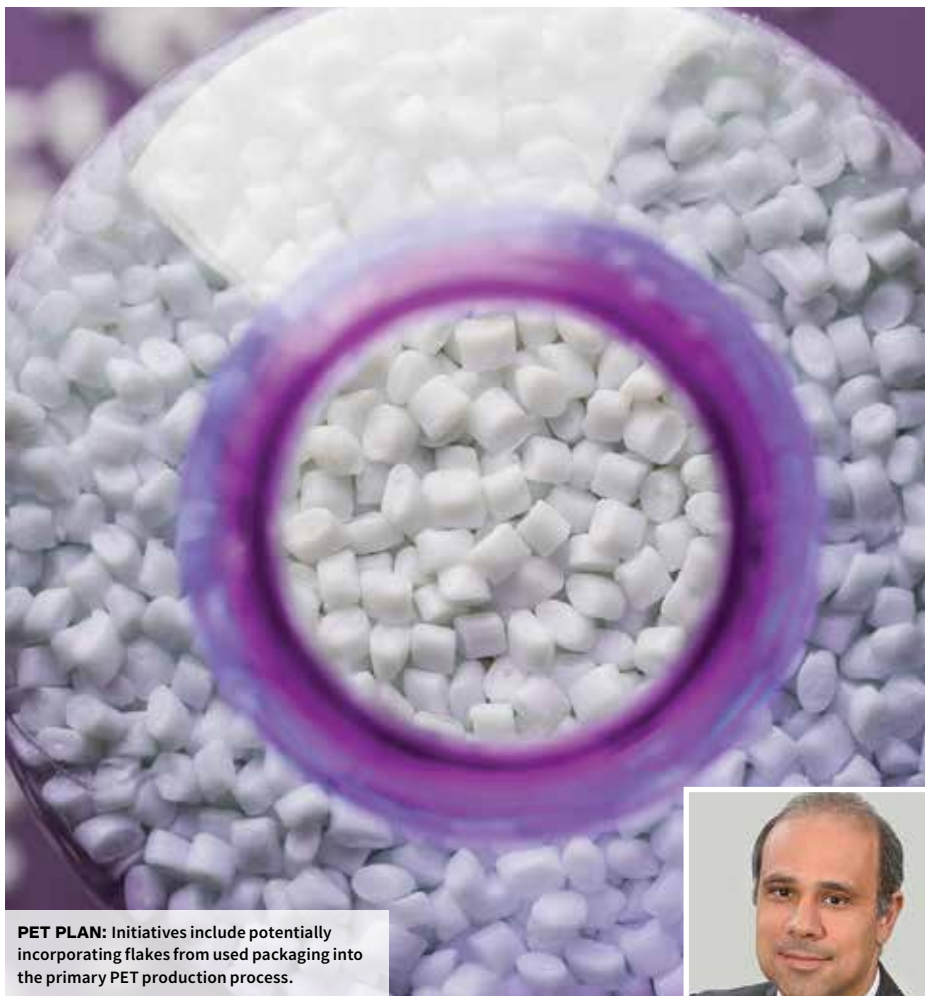
IHS Markit's Page says the Amur project is "strategically positioned next to a major gas reserve being developed by Russia to supply China by pipeline from the north. The gas in this field has a high concentration of ethane, which is a major issue for the gas pipeline but is ideal for the production of petrochemicals."

Developing ZapSib will also be a big help to SIBUR in constructing the Amur complex. "While SIBUR's task in building ZapSib in Tobolsk was challenging, the task of building an even larger facility in an even more remote location at Amur would be hugely daunting to any other company," Page says. "However, SIBUR is probably uniquely qualified to be successful in this task by using its experience at Tobolsk and leveraging its existing relationships with key contractors in Russia."

The Amur GCC will pave the way for another huge expansion of SIBUR's market presence in China. It will be SIBUR's first project to be fully focused on Asian consumers. "It is obvious that it will be geared to Asian markets because of its geography," Lyakhovich says. "We do plan to harness the expanding opportunities offered by the Chinese market and benefit from the country's positive demand trajectory. Despite its own new capacities, China will still need to import certain products. That is why cooperation with Russian manufacturers is strategic for China, and the ambitious Amur GCC project with its primary focus on the Chinese market will definitely make a difference."

Cheap feedstocks will make the Amur plant competitive in the Chinese market. "Once built, like Tobolsk, the net feedstock cost in Amur will be highly advantaged, giving a feedstock cost comparable to producers in the Middle East," Page says. "The Amur facility will be able to export the polyolefins by rail and road down into northern China at a lower cost than from Tobolsk, allowing more product from Tobolsk to be pushed into Central and Western Europe."

## Setting the pace in plastics, specialty chemicals



**PET PLAN:** Initiatives include potentially incorporating flakes from used packaging into the primary PET production process.



**AVETISOV:** Multiple investment projects underway.

**S**IBUR is making rapid progress on several significant projects in the plastics and organic synthesis products sector that will reassert its leadership position in the domestic Russian market and enhance its role as a key supplier to growing export markets.

The company is investing in facilities that reflect the Russian industry's import-substitution efforts and will contribute to the country's strengthened focus on exports, says Marat Avetisov, SIBUR sales director/plastics and organic synthesis products.

One of SIBUR's highest-profile projects is its phthalate-free dioctyl terephthalate (DOTP) plasticizer facility at Perm. Inaugurated in 2019, the 100,000-metric tons/year plant is Europe's largest manufacturing facility of its

type, he says.

DOTP is a new product offered by SIBUR, and its production opens fresh opportunities both in Russia and export markets. The Perm project is designed to "help substitute a major part of alternative product imports in high-tech and enable plasticizer supplies to export markets, where the demand for DOTP is also rapidly growing," he says. DOTP, an eco-friendly and safe plasticizer, is a key component in floor- and roof coatings, wallpaper, cable compounds, and other construction products, enhancing durability, wear, and cold resistance.

Demand for DOTP is higher than for other

plasticizers as it does not contain phthalates, with consumption growing at a rate of over 7% per year globally. The Russian plasticizer market is currently over 150,000 metric tons/year, with more than 30% made up of similar imported products. SIBUR says its main target market is primarily Russia, where it is starting to phase out and replace those imported products with its own.

In May SIBUR's DOTP was certified under the European Pharmacopoeia standard for the medical and pharmacological sectors, enabling expansion into overseas markets for medical compounds. In Russia, the medical compound and items based on it were certified by the Federal Service for Surveillance in Healthcare. Medical items produced using the plasticizer have gained "incredible traction, especially amid the pandemic," it says.

Directly related to the DOTP project, SIBUR completed a 350,000-metric tons/year expansion at its POLIEF facility at Blagoveshchensk to supply terephthalic acid (TPA), a raw material for DOTP production. "The capacity increase ensured feedstock availability for the DOTP project," says Avetisov.


Another high-profile project to build a 45,000-metric tons/year maleic anhydride (MA) facility at Tobolsk is expected to come online at the end of 2021 or early 2022, Avetisov says. "MA will allow us to optimize the monetization of our feedstock—namely butane—and generate value-added products for our customers, given MA's versatility of end use," he says.

In the polyethylene terephthalate (PET) segment, SIBUR—Russia's largest producer with sales exceeding 40% of the market—has major sustainability initiatives underway. "Our clients, global fast-moving consumer goods companies, have ambitious goals to achieve high levels of recycled PET content in their bottles," Avetisov says.

The company's work on potentially incorporating PET flakes from used packaging into the production process for primary PET at the POLIEF facility is a prime example. If implemented, it would see SIBUR produce pellets containing primary and secondary polymers, contributing to a "two-fold increase in the collection and recyclability of PET packaging in Russia," he says.



## Know-how and technology key to elastomers expansion



**NEW CAPACITIES:** SIBUR developed and began producing new grades of thermoplastic elastomer at its Voronezh facility in 2020, including styrene-butadiene-styrene.

**S**IBUR is utilizing its technological expertise and its established partnerships with some of the world's largest energy and petrochemical companies to expand its elastomers business into new and emerging sectors, while cementing its long-held position in the European market.

The company, which sells its products to 90 countries, has joint ventures (JVs) in place with Sinopec and Reliance Industries. These partnerships illustrate SIBUR's strategy of leveraging its know-how and technology in the synthetic rubber market, as well as its sales and marketing expertise, says Alexander Petrov, SIBUR management board member and head of plastics, elastomers, and organic synthesis products.

The signing in September 2019 of a memorandum of understanding (MOU) with Sinopec could see them cooperate in the production of up to 50,000 metric tons/year of nitrile butadiene rubber (NBR) in China, and styrene-, ethylene-, and butylene-based block copolymers (SEBS) in Russia. "The MOU comes as a result of the productive partnership around the NBR project at

SIBUR'S Krasnoyarsk plant," says Petrov.

The SEBS agreement is aimed at making at least 20,000 metric tons/year of product, for use across a variety of industries such as plastics and bitumen modification, adhesives, modification compounds, and consumer goods. "This product has a very strong potential, thanks to its unique properties and increasingly diverse applications. Russia has to import SEBS because there is no local production. These factors, taken together, open up good prospects for the SIBUR-Sinopec project," says Petrov.

SIBUR has also been working with Reliance since 2012. The Reliance Sibur Elastomers Ltd. JV was established to construct a 120,000-metric tons/year butyl rubber facility at Jamnagar, India, based on SIBUR's unique solution-polymerization technology. The IIR (butyl rubber) plant, SIBUR's first foreign project, was commissioned last year and is on track to achieve its design capacity. It is the company's first



**DEVELOPMENT:** Synthetic rubber innovation in action at Krasnoyarsk.

attempt to export its eco-friendly butyl rubber technology. The one-of-a-kind solution-polymerization technology does not use toxic solvents and is one of the few examples of technology from Russia successfully exported to foreign markets.

SIBUR is also completing construction of a halogenated butyl rubber plant at Jamnagar in collaboration with its partners to produce 60,000 metric tons/year from butyl rubber feedstock. Production will start in 2021, he says.

In Europe, a key market accounting for about half SIBUR's total elastomers exports, it is "continuously working with the quality of our products to fulfil the growing requirements of our European customers, together with improving our value proposition," he notes.

Because of challenging market conditions for thermoplastic elastomers, new capacities launched recently and others planned for launch

have had a negative impact on prices and margins, Petrov says. Developing new grades and growing new segments for styrene butadiene styrene (SBS) consumption "allow SIBUR to compete with other SBS producers," he says. "SIBUR has launched new SBS capacity in Voronezh, Russia. Producing SBS is a possible development stream for the thermoplastic elastomers market." The facility will produce five new SBS grades, with the first ton of thermoplastic elastomer produced in January 2020, with the plant then ramping up trial production and implementing homologation of the new grades. Despite COVID-19, the trial production at Voronezh was not postponed, and 3,000 metric tons were produced by April.



**PETROV:** Leveraging expertise, partnerships in elastomers.



## Strengthening company-wide sustainability commitments



REMCHUKOV: SIBUR coordinates sustainability activities across the company.

**S**IBUR has embraced sustainable development as a core part of its business. It established a sustainable development department last year to coordinate sustainability activities across the company. The priorities are to monitor and implement best practices, implement circular-economy principles, enact the company's climate agenda, advance activities to address plastic waste, and increase the use of renewable sources of raw material. SIBUR's strategic innovation division and newly established PolyLab work together on the company's product portfolio to make it align with circular-economy principles.

"SIBUR takes sustainability very seriously and considers the expectations of all our stakeholders," says Maxim Remchukov, sustainable development director at SIBUR. "We are very glad that environmental and social performance, as well as corporate transparency and readiness to respond and adapt to global challenges, have become more and more important for stakeholders."

SIBUR joined the UN Global Compact in September 2019, an indication of the company's strong commitment to sustainable development and a desire to contribute to the UN's Sustainable Development Goals (SDG). The company's environmental activities aim for continuous improvement, risk mitigation, reducing the company's environmental impact, and application of best practices and clean technologies.

The company communicates with

customers on circular-economy issues and is increasing efforts to provide products that can meet the growing demand for more sustainable and recycled content. Furthermore, SIBUR is aiming to promote the market for secondary raw material in Russia, interacting with all market participants. "We share our experience, expectations, and difficulties with regulators, discuss legislative proposals, and contribute to the development of a sound legal framework for sustainability," Remchukov says.

SIBUR has established a board-level ESG committee to oversee sustainability priorities including the climate agenda. Prior to that, the board of directors approved the company's 2025 Sustainability Strategy. This is aligned around five key objectives: responsible business practices, environmental protection, society and partnerships, sustainable product portfolio, and reducing climate impacts. "It was developed with due consideration to the UN's 2030 SDGs and global sustainability agenda, stakeholder expectations, international benchmarks and



**CHANGING ATTITUDES:** Pandemic has raised awareness of value and versatility of plastics in essential applications.

best practices, and long-term business planning, as well as corporate values and priorities," Remchukov says.

The plastic waste challenge is a key focus. "Advanced technologies are one side of the solution, and petrochemicals is a high-tech industry that can quickly adopt new solutions," he says. "We have committed to increase investments in R&D projects aimed at processing plastic waste and involving renewable sources of raw materials by 50%."

The challenges also present an opportunity, Remchukov adds. SIBUR has started work on a project to incorporate polyethylene terephthalate (PET) flakes from recovered packaging into the production process for PET at the company's POLIEF facility in the Republic of Bashkortostan. The company's 2025 sustainability goals include an effort to ensure that 40% of its PET production includes recycled content.

Plastics are a key part of addressing sustainability challenges and industry needs to highlight the full life-cycle impacts of plastics and alternative materials. "Plastics have numerous environmental advantages throughout the whole life cycle when compared to alternatives," Remchukov says.

SIBUR also notes that the COVID-19 pandemic is changing attitudes toward plastic. People are recognizing the value and versatility of plastics and how they can help in the fight against COVID-19 through essential medical applications such as face masks, gowns, ventilators, and visors.

## PolyLab integrates research with practical market development



**POLYLAB:** Role of new research facility goes beyond being SIBUR's R&D center.

**S**IBUR opened its PolyLab research facility in May 2019. “By and large, the first six months were quite fruitful in two ways,” says Konstantin Vernigorov, general manager at SIBUR PolyLab.

“First, PolyLab is operating in full and implementing the scheduled research and development projects. Second, we have been actively building relationships with a wide range of SIBUR’s partners, including customers, suppliers, equipment manufacturers, global manufacturers of finished materials, and even experts in academic and applied research,” Vernigorov says.

In the first 140 days after its opening, PolyLab held more than 70 events, fostering long-term cooperation with SIBUR’s partners from feedstock consumers to end users. “By the time PolyLab was completed, we knew that its role in the plastics manufacturing and processing industry would go far beyond it being just SIBUR’s R&D center,” he says. “However, what surprised us most was the industry’s keen interest in PolyLab’s technical capabilities. The new challenges the industry is facing made us rethink the value of partnership and understand that it is only through partnership that we can facilitate sustainable development of the industry in the long run.”

It is a challenging time to open a polymer research center, with plastics a global environmental issue. One stated goal is that the lab will foster the use of recycled materials and a circular economy. “Application of polymers in the circular economy is a global challenge that requires joint efforts,” says Vernigorov. This includes feedstock producers, companies undertaking collection and sorting of plastic waste, providers and developers of relevant technologies, end users, and government agencies.

“It can be described as a complex and emerging system of partnerships among different types of business sharing a common goal,” he says. “However, such a partnership is impossible without appropriate technical resources to assess the quality and recyclability of different plastic-waste fractions, to make sure plastic-waste-based products comply with safety and environmental requirements. To ensure fully-fledged collaboration, we need to bring ideas to life through pilot

projects, experimenting, and validating existing technology.”

A memorandum of understanding was signed with BASF on sustainable development in December 2019. “BASF is one of our strategic partners,” says Vernigorov. “We have collaborated in various areas including gas processing, petrochemicals, sharing best practices in digitalization, and approaches to marketing and sales.”

PolyLab works with BASF primarily developing SIBUR’s polypropylene (PP) and polyethylene (PE) grades, using chemicals supplied by BASF. “We did it before, but at PolyLab, SIBUR and BASF will reach a new level in terms of efficiency, speed, and coverage,” he says. “We are striving to unlock untapped potential.”

Apart from BASF, PolyLab works with Norner, 3M, and Reifenhäuser. Norner was instrumental in helping SIBUR create PolyLab. “The scope included value-chain understanding, processing, and special application testing. The objective was to enable SIBUR to evaluate polymers based on performance in real life, and not only offer traditional product datasheet testing,” says Lars Evensen, director/business development at Norner.

Beyond PolyLab, SIBUR has two other R&D facilities: NIOST and Elastomers R&D Center. They are tasked with supporting and boosting the operational efficiency of the company’s existing production facilities, expanding its grade portfolio, and developing new products and technologies.

Located at Tomsk, NIOST deals in chemical technologies for basic polymers, plastics, and organic synthesis, along with gas processing, while the Elastomers R&D Center in Voronezh focuses on elastomers.

The opening of PolyLab and other R&D facilities marks a key shift in the company’s thinking, SIBUR says. The centers bring together R&D and sustainable development with active participation from customers. Together with its partners, PolyLab is working to improve SIBUR’s existing portfolio, including new grades of resin.



**VERNIGOROV:** SIBUR is striving to unlock potential.



## Implementing Industry 4.0 at existing plants, new complexes



**STAYING IN TOUCH:** Field personnel use mobile apps for plant equipment inspections.

The large-scale digital transformation under way at SIBUR is leading the company to a new level of efficiency, says Alisa Melnikova, director of information and digital technologies. “It is being achieved through holistic optimization of production and business processes, as well as business-process digitalization,” she says. Key projects include advanced analytics for production efficiency, predictive maintenance, the industrial Internet of things (IIoT), logistics, and sales optimization. The whole value chain is in fact being optimized using new digital tools, she says.

SIBUR presented several digital developments to senior Russian government officials, including Prime Minister Dmitry Medvedev, last year. “SIBUR has launched plenty of tools using advanced analytics,” says Melnikova. “We have launched our decision-support system that visualizes the dependency of economics from the technological mode chosen by the operator. That allows engineers to understand their own contribution to the benefit of the company.”

Digital transformation is one of the drivers of SIBUR’s successful development, she says. “For the petrochemical



**MELNIKOVA:** Digital transformation is one of the key drivers of SIBUR’s successful development.

industry, economic effects combined with long-term competitive advantage come from data-driven decision making in both production and business processes. Digital technology affects the entire value chain, from R&D to sales. Digital technologies improve performance in many areas,” she says.

Machine learning (ML) is used to control production processes, for example. One model predicts issues in polypropylene (PP) extrusion equipment and helps to prevent them by giving recommendations to operators. Furthermore, by analyzing big data along the

entire production chain from product manufacturing to processing outside the company, SIBUR helps to improve clients’ product quality.

Another example is the use by field personnel of mobile apps for plant equipment inspections. IIoT elements such as sensors, beacons, and cameras are used with machine-learning platforms to give personnel accurate data that are used for equipment maintenance strategies.

“All of our IIoT-equipment should withstand very low temperatures,” says Melnikova. “There were no ready-made devices in the market, so we had to start our own development in-house. Now we have our own explosion-proof sensors and beacons, all of which can withstand extremely cold temperatures.”

The mobile app provides field personnel with their tasks, the results of the previous shift, and defects that have been fixed. It also collects large amounts of data and runs on a special explosion-proof smart phone.

“For predictive maintenance, we need to collect statistics on equipment condition, and use analytical tools for its analysis and the development of repair strategies,” says Melnikova. “IIoT is used to collect data along with digitalization tools, while a data lake ensures storing and managing data quality, and advanced analytics tools allow for patterns identification, generation of recommendations, and decision-making.”

SIBUR uses drones to monitor remote facilities, collecting data not available during traditional inspections.

“Unmanned vehicles simplify and automate processes: in Tobolsk, a drone takes samples from a river to monitor the environmental situation,” she says.

“When designing new facilities, such as the Amur complex, which is set to become one of the largest petrochemical plants in the world, we created digital twins,” she says. “That will ensure digitalized remote management of manufacturing, and a step-by-step shift of all existing facilities to the same technology.”