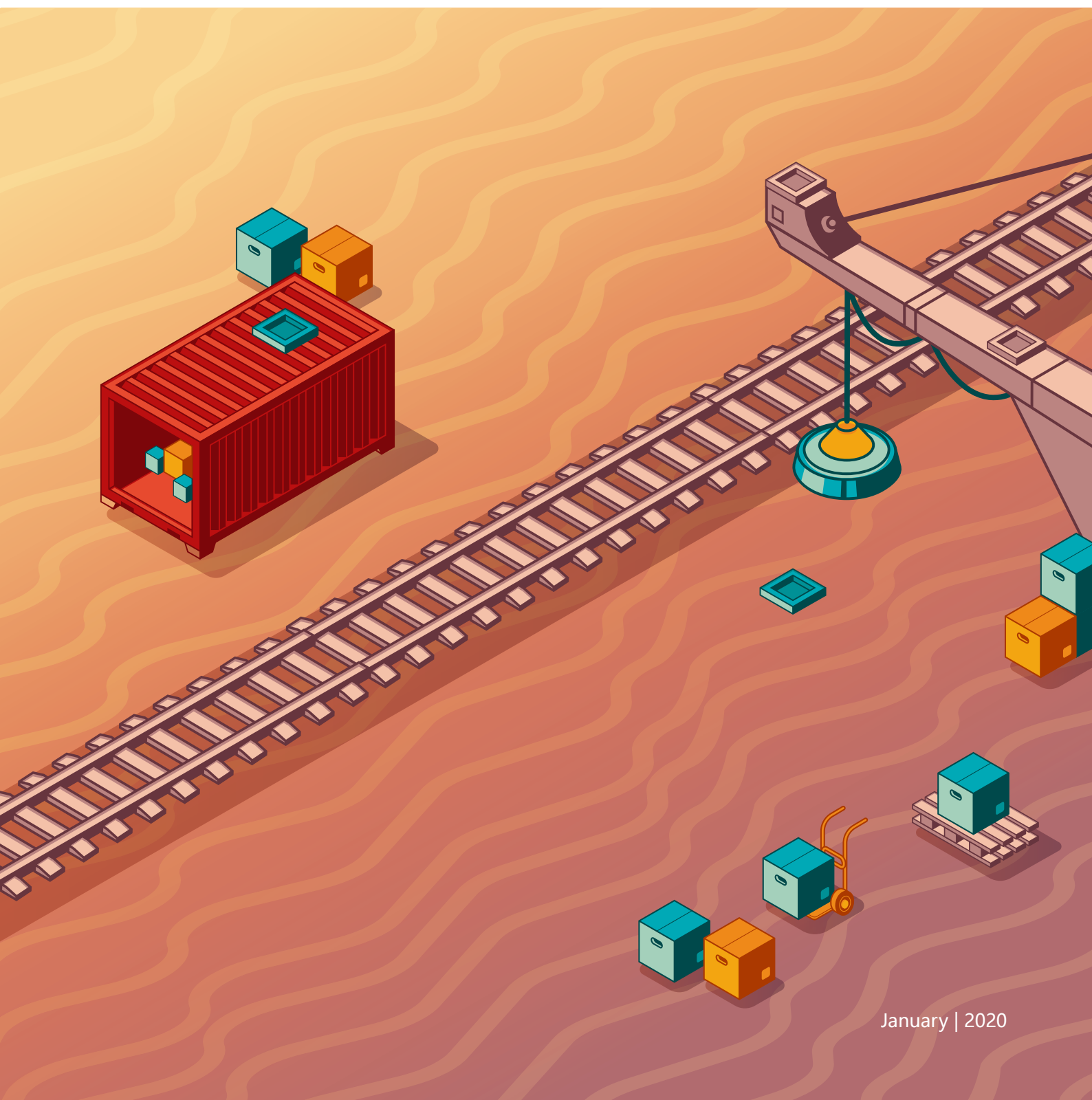


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## **CHEMICAL INDUSTRY OF THE EUROPEAN UNION: KEY PRODUCERS AND THEIR TRANSPORT AND LOGISTICS CAPABILITIES**

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# **EUROPEAN UNION CHEMICAL INDUSTRY OVERVIEW**

# Competitiveness of the European Union's Chemical Industry: Key Figures and Trends

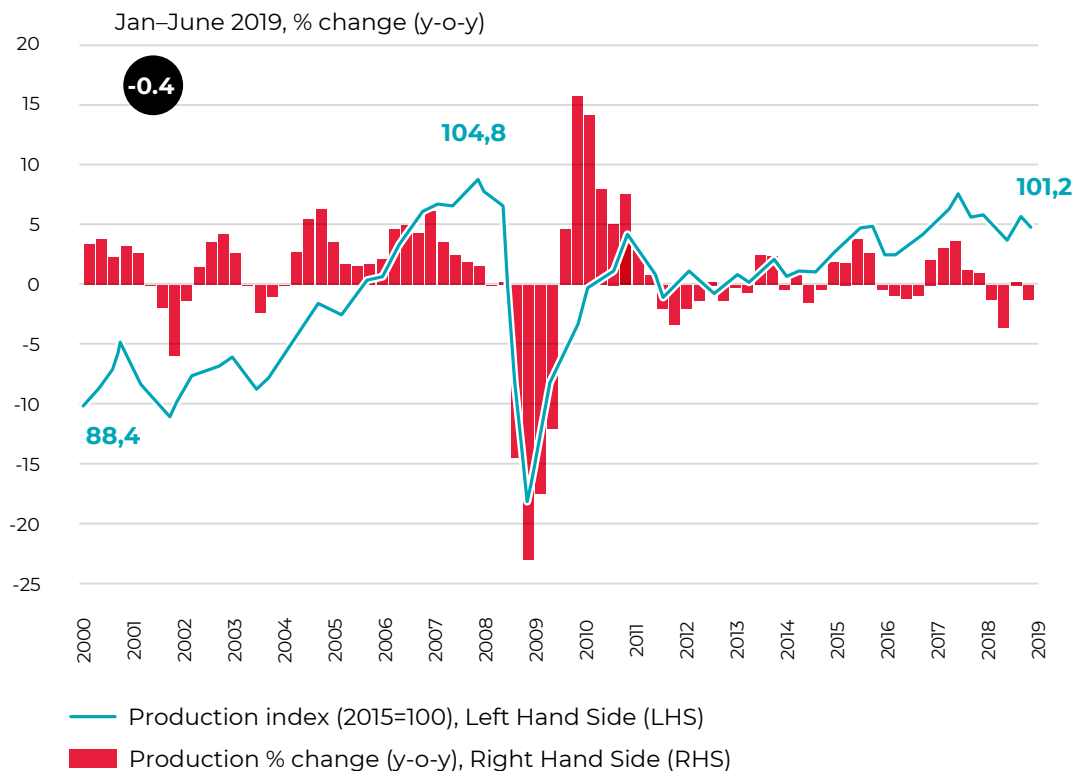
In today's world, the chemical industry is a valuable element of the global economy: the contribution of the chemical industry to the world's gross domestic product (GDP) is estimated at 7%. In 2018, world annual chemical sales amounted to USD 3.95 bln, which is 2.5% above the level of 2017.

The EU is one of the world's largest chemical industry hubs. The maturity of the current EU chemical industry is historical: it is the region where the first chemical plants were launched during the industrial revolution.

Now, the chemical branch of the EU economy is bumping into uncertainties. The growing protectionism all over the world has made a negative impact on manufacturing and economic activities. The uncertainty about Brexit and the escalating trade conflict of the USA with key partners impairs investor confidence. Besides, there is a plateau in the development of other manufacturing industries that contributes to the deterioration of demand for chemicals. As a result, in 2018, the volume of the EU chemical production began to decline, while the total volume remained at the level of previous years.

Figure 1

## CHEMICAL PRODUCTION IN THE EU<sup>1</sup>



Source: CeficChemdata International 2019

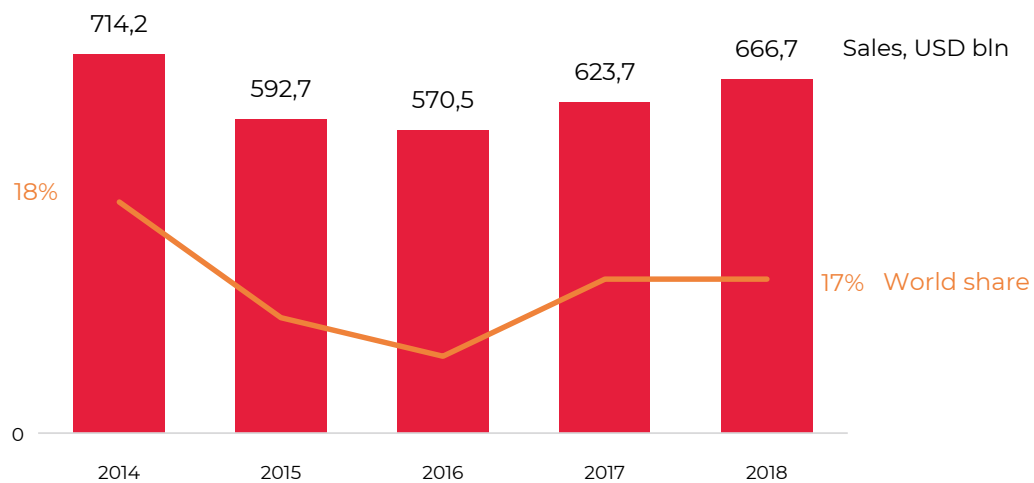
1 Source: <https://www.chemlandscape.cefic.org/country/eu/>

The EU chemical industry ranks second in the world in terms of sales, thus outpacing the USA. In 2018, the volume of sales of the EU chemicals has grown by 6.8% compared to 2017, but decreased by 7.1% to 2014. The demand for chemicals is booming in China, India and other developing countries, while the situation in Europe and North America – key markets for European chemical manufacturers – is developing in the opposite direction.

The EU's share in the world has almost halved over the past 20 years (from 32.9% to 16.9%) due to the boom of the global chemical market, and this trend is expected to continue as China is strengthening its position on this market globally. By 2030, according to estimates, the EU will drop to the third place in the world, thus losing to China (whose share in the world chemical market will reach 50% by this year) and the USA.

Figure 2

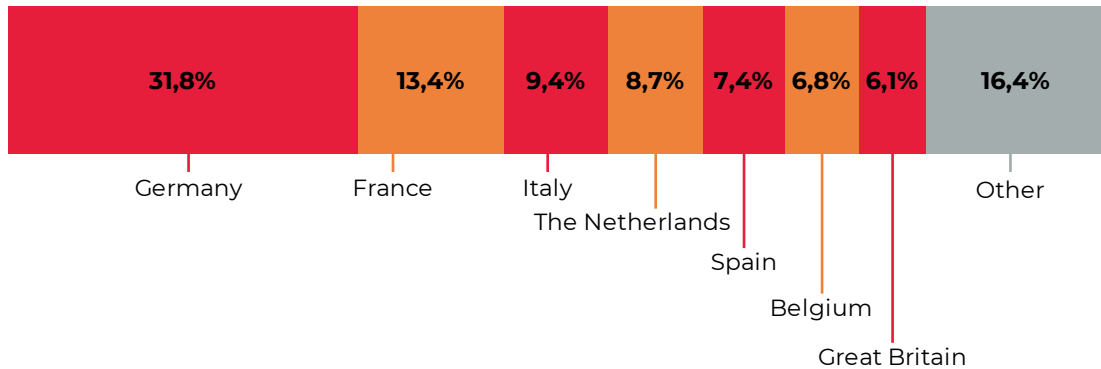
### EU SHARE IN THE GLOBAL CHEMICAL MARKET



Source: International Council of Chemical Associations (ICCA)

Germany and France are the leading chemical producers in the EU. They are followed by Italy and the Netherlands: these four countries together accounted for more than 60% of the EU sales of chemical products in the EU in 2018. Their share, if added to that of Spain, Belgium and the UK, reaches as high as 83.6%. The remaining EU member states accounted for 16.4% of chemical sales.

Figure 3

**STRUCTURE OF THE EU CHEMICAL INDUSTRY MARKET (AS A SHARE OF EU SALES), 2018<sup>2</sup>**

Source: CeficChemdata International 2019

## Foreign Trade of the European Union Chemical Industry

Chemical trade promotes global competition, development of new markets and improved production efficiency. The EU, as an important player on the global chemical market, continues to benefit from trade with third countries.

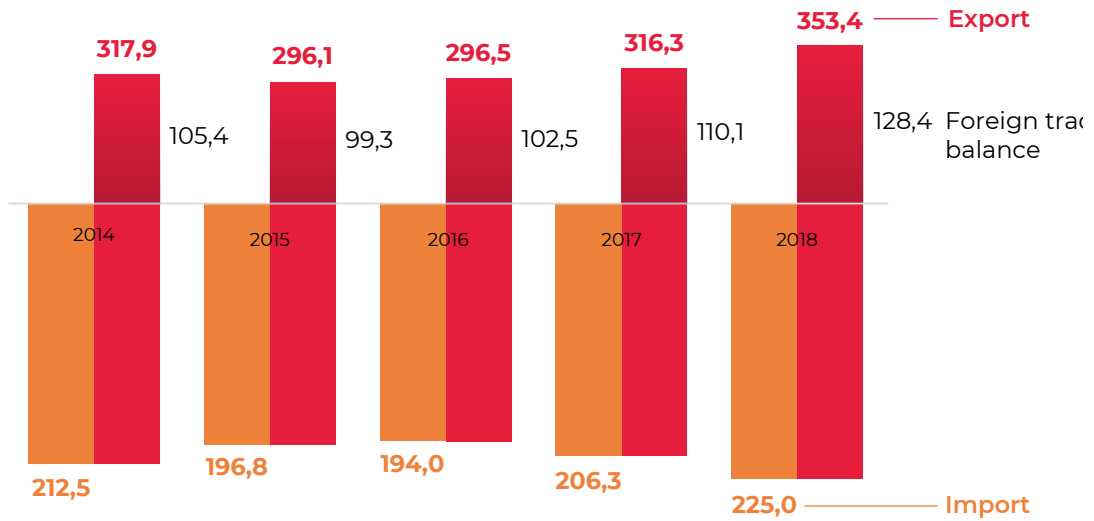
The EU is a net exporter of the chemical industry. EU exports account for almost half of the world chemical exports.<sup>3</sup> Still, the export is effected mainly to the EU member countries. In 2018, only 29% of revenue was generated from chemical sales on foreign markets.

However, there appears a positive trend in the volume of exports to third countries over the past 5 years – an increase by 11.2%. At the same time, imports has increased twice less compared to exports. In 2018, in the context of outperforming growth rates, the trade balance has reached USD 128.4 bln, which was the largest amount for the period under consideration.

<sup>2</sup> Structure of the EU Chemical Industry Market (as a Share of EU Sales), 2018

<sup>3</sup> When accounting for total exports to the EU member states and to third countries.

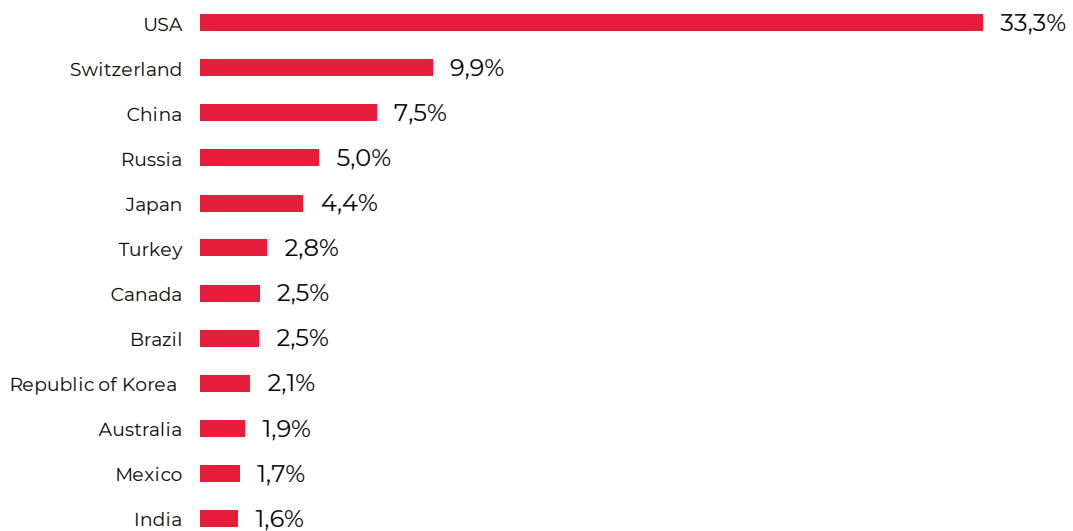
**Figure 4**  
**EU FOREIGN TRADE, USD BLN<sup>4</sup>**



Source: generated by ITI based on the data of the International Trade Center (ITC)

The global chemical market is increasingly dependent on the needs of developing countries such as China, India, Russia, and Brazil. This can foremost be driven by their economic growth resulting in the need for these countries to satisfy the demands of their accelerated capacities. This largely applies to China.

**Figure 5**  
**GEOGRAPHICAL STRUCTURE OF THE EU EXPORTS, 3Q<sup>5</sup> 2019**



Source: generated by ITI based on ITC data

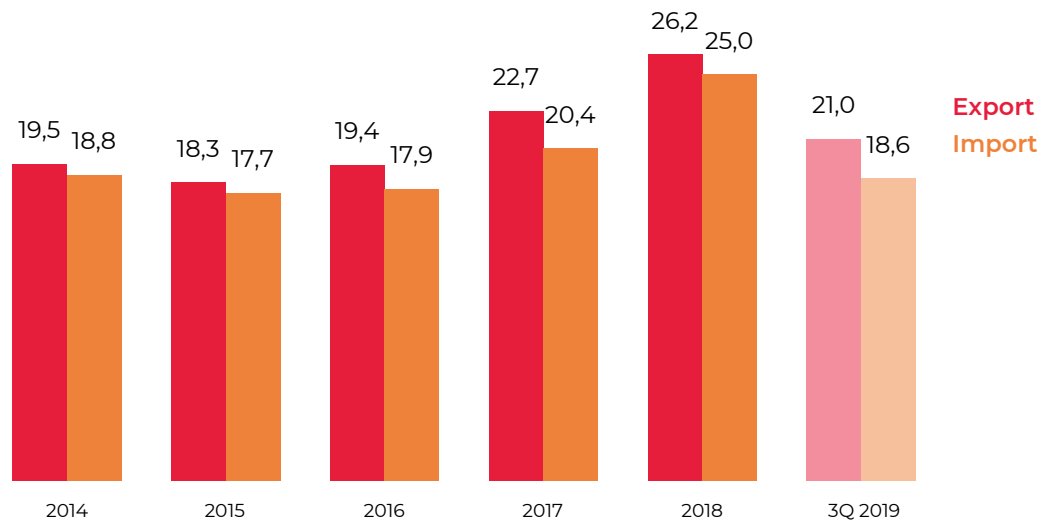
4 The exports and imports volume is calculated on the basis of statistical data on trade with non-member countries of the EU.

5 Q – quarter

The EU-China chemical trade is developing steadily, with the EU's surplus in trade with China. This suggests that there is a significant need in transportation of products from the EU to China.

Figure 6

THE EU CHEMICAL TRADE WITH CHINA, USD BLN

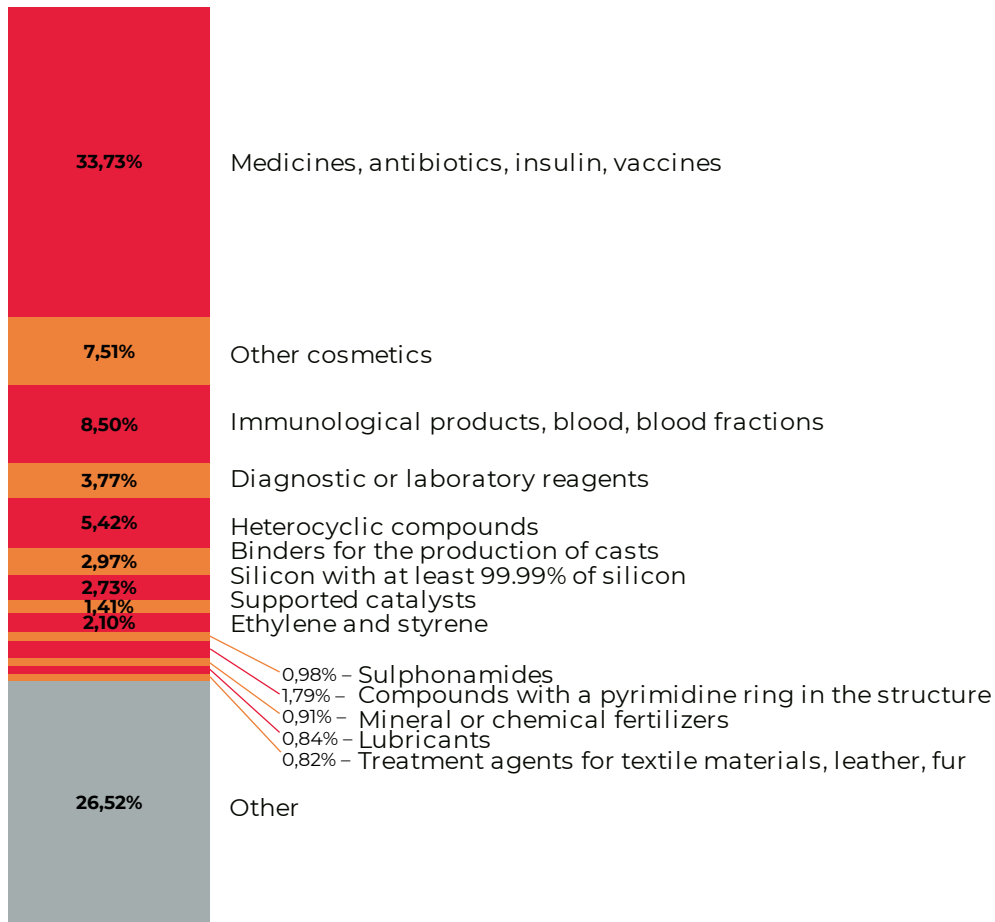


Source: generated by ITI based on ITC data

At large, the EU's exports to China consist of medicines, cosmetics, immunological products and blood. These commodity groups account for about 50% of total exports. As is evident from the export structure, rail transportation using containers can be used to transport key chemical products exported by the EU to China. At the same time, it is necessary to consider specific rules of transportation due to the nature of such goods. For example, there are many requirements for the transportation of medicines, including the use of refrigerated containers maintaining a certain pre-set temperature regime. For many manufacturers, the cost of transportation in refrigerated containers depends on the term of lease of such a container, and thus, railway transport is more suitable for such transportation compared to marine, since it is 6 times faster to move goods from Europe to China by rail than by sea.

Figure 7

## COMMODITY STRUCTURE OF THE EU CHEMICAL EXPORTS TO CHINA, 2018



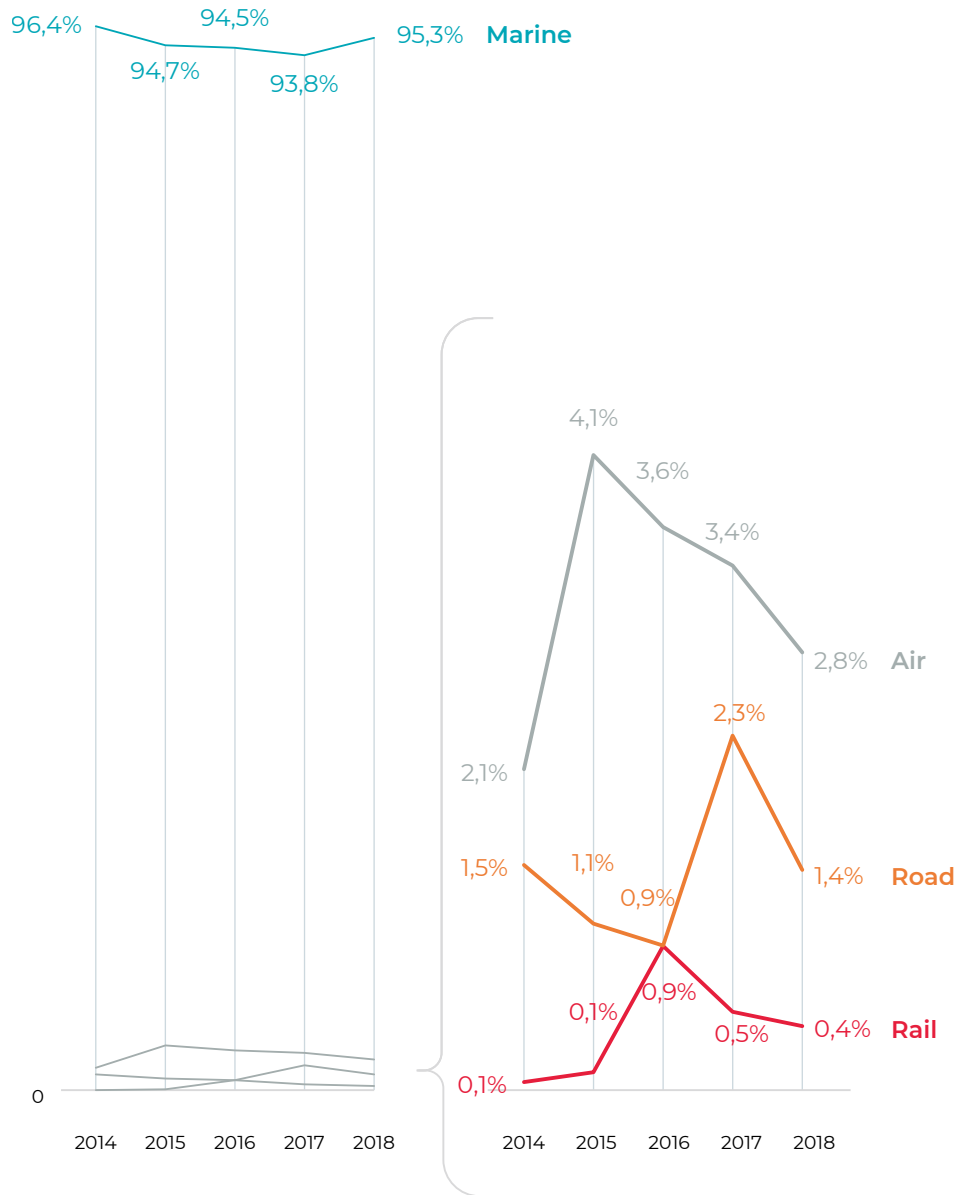
Source: generated by ITI based on ITC data

Currently, deliveries are mainly carried out by marine transport, which in 2018 accounted for 95.33% of the total volume of transported chemicals. Thus, speaking about competition, we mean competition among the other three types of transport. Despite the rapid augmentation of trade between the EU and China via railway transport, this type still ranks last in terms of the volume of transported chemical products, with a share of 0.41% in 2018. Due to the specific nature of products and business practices in the chemical industry, large chemical holdings are striving for a territorial presence on all most promising sales markets and aiming, among other things, to reduce the transportation cost of the exported products.



Figure 8

**DYNAMICS OF THE EU CHEMICAL EXPORTS TO CHINA BY MEANS OF TRANSPORT, % OF THE QUANTITATIVE VOLUME**



Source: generated by ITI based on Eurostat data

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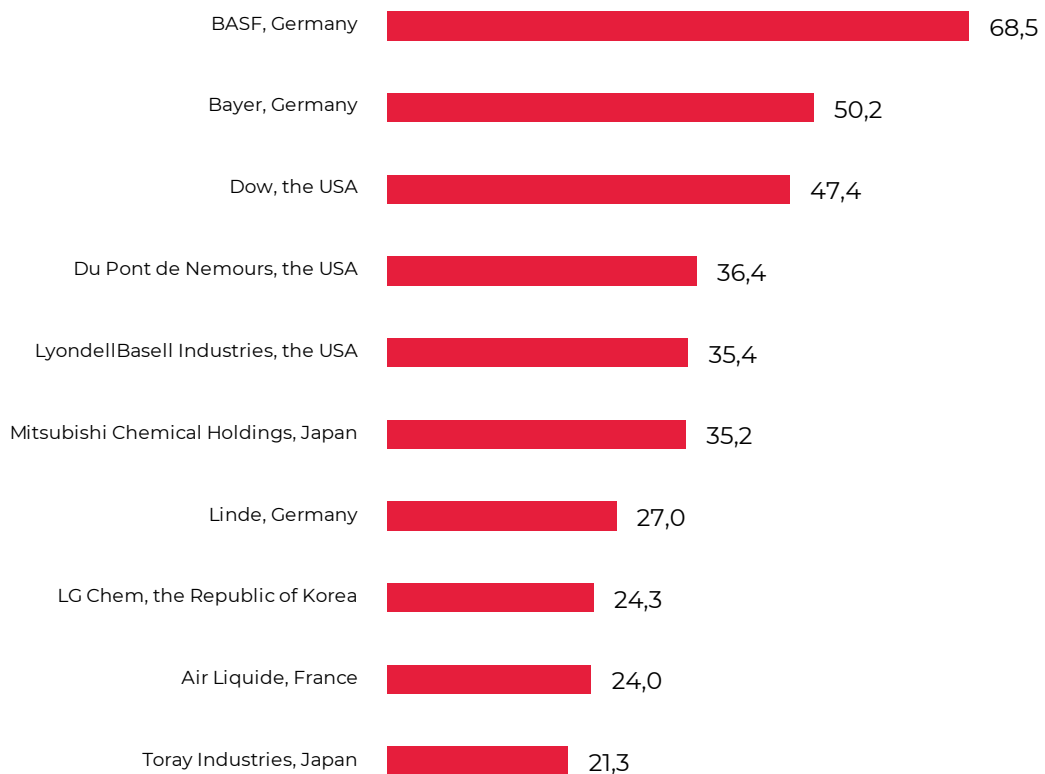
**MAJOR PLAYERS  
OF THE EUROPEAN  
UNION'S CHEMICAL  
INDUSTRY:  
MANUFACTURING  
AND LOGISTICS**

# Major players of the European Union's Chemical Industry: Manufacturing and Logistics

According to the results of 2019, four major European manufacturers are among top 10 largest companies in the global chemical industry in terms of revenue. German manufacturers BASF and Bayer consistently rank among the leading companies. BASF specializes in the production of chemicals, plastics, agricultural products, as well as oil and natural gas. Bayer, a company with multiple headquarters around the world, used to be known for marketing heroin and branding aspirin.

Figure 9

## WORLD'S LEADING CHEMICAL MANUFACTURERS IN TERMS OF REVENUE IN 2019 (USD BLN)<sup>6</sup>



Source: Statista<sup>7</sup>

<sup>6</sup> In 2019, the companies Dow and Du Pont de Nemours were demerged from a combined company – DowDuPont.

<sup>7</sup> Source: <https://www.statista.com/statistics/272704/top-10-chemical-companies-worldwide-based-on-revenue/>

# BASF

## MANUFACTURING

BASF is the largest chemical concern in the world. This industrial giant of Germany has production facilities almost in all EU countries with the exception of Cyprus, Lithuania, Luxembourg and Estonia. Besides, BASF invests heavily in China's chemical industry. Core production facilities are located in Shanghai, Nanking and Chungking.

Figure 10

### LOCATION OF BASF HUBS IN EUROPE AND ASIA



Source: BASF Group

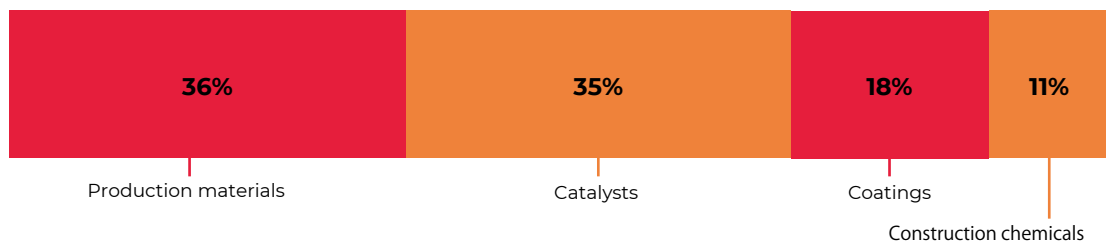
Europe outpaces other regions in terms of sales. In Europe, in 2018, sales to other regions exceeded sales inside the region by 8.47%. Notably, the volume of sales by BASF companies in Germany exceeded the volume of products sold throughout this region by almost one and a half times. It may be concluded that BASF production facilities located in Germany can satisfy the local demand, while exporting products to third countries. There is the opposite situation on the markets of A/P, South America, Africa and the Middle East: these regions consume more BASF products than they produce and sell themselves, which makes them an attractive export target.

The company produces a wide product range falling into four main groups: catalysts (process catalysts, battery materials, precious and non-precious materials, etc.), construction chemicals (concrete and cement additives, floor coating systems, sealing compounds, cement mortars, etc.), coatings (automotive coating products, surface treatment technologies, decorative paints, etc.), production materials (engineering plastics, biodegradable plastics, foam materials, polyurethanes, etc.)

In 2018, the production materials group accounted for the bulk of total sales – 36%.

Figure 11

### PRODUCT STRUCTURE OF BASF SALES, 2018



Source: BASF Group<sup>8</sup>

## LOGISTICS AND TRANSPORT

At BASF key facilities, some 30% of the goods are transported by rail, a similar share – by road, and some 40% – by sea. Short-distance transportation is mainly carried out by road and rail. Railway transport plays a critical role for BASF as it is an environmentally friendly means of transport. Railway also provides connection to BASF factories in Europe.

The company's terminals are also available to both external carriers and shippers. The Ludwigshafen terminal is served by Kombi-Terminal Ludwigshafen GmbH (KTL). Transport companies Bertschi (Switzerland) and Hoyer (Hamburg), as well as the Hupac (Switzerland) and Kombiverkehr (Frankfurt) companies specializing in intermodal transportation are among shareholders of KTL, other than BASF.

At the present stage, BASF seeks to unload the road infrastructure used by switching to rail transportation. According to the company, some 50,000 trucks are excluded from the BASF transport network a year. It shall be noted however, that transition to railway (end of paragraph).

8 Source: <https://report.basf.com/2018/en/managements-report/segments/functional-materials-solutions/products-and-investments.html>

# Bayer

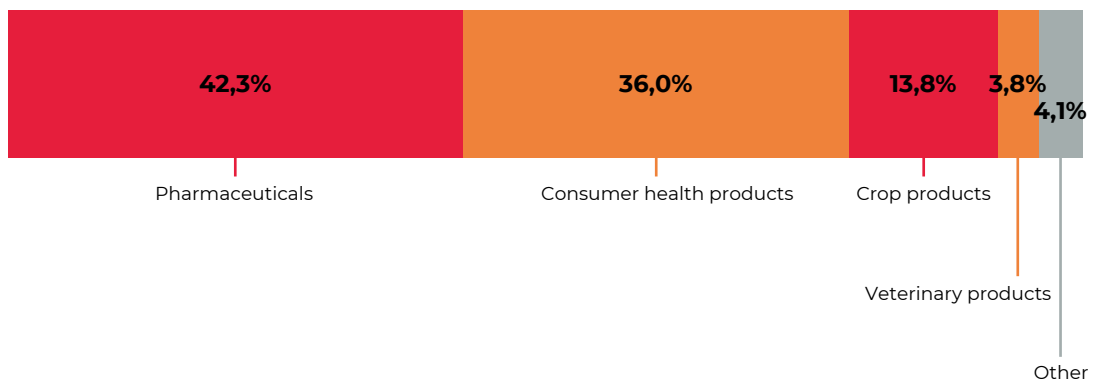
## MANUFACTURING

Bayer is a company specializing in biotechnological sciences and a global leader in the field of healthcare. The company produces high-quality food products, feeds and vegetable raw materials, following the principle of sustainability of resources. The product structure can be divided into four groups: pharmaceuticals, consumer health products, crop products and veterinary products.

In, 2018, the largest share of total revenue – 42.3% – was generated by the pharmaceuticals group. Bayer specializes in the production of medicines in the areas of cardiology, oncology, ophthalmology, hematology, infectious diseases and neurology.

Figure 12

### BAYER AG REVENUE BY SEGMENTS, 2018



Source: Statista<sup>9</sup>

Europe is leading in terms of attracted investment and production capacity, although Bayer consists of some 420 companies located in 90 countries. There are manufacturing facilities in the United States, Argentina, Brazil, Mexico, India, Indonesia, Japan and China too. But in China, only pharmaceuticals are produced (Beijing) and research works are carried out in the segment of consumer health products only (Qidong, Jiangsu province).

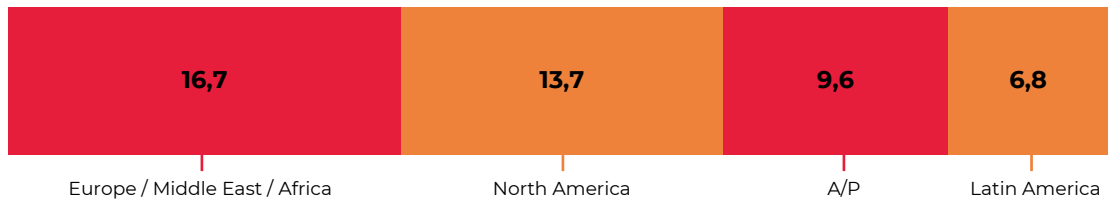
In 2018, total Bayer sales volume has grown by 4.5% compared to 2017. This was mainly due to an increase in pharmaceuticals sales, namely by 3.4% in such regions as Europe / Middle East / Africa and A/P.

Sales of consumer medical products remained at the level of 2017. The same comment was applicable to veterinary products. Sales of crop products has boosted by 49% in 2018 due to the acquisition by Bayer of some BASF businesses. The purchase of Monsanto added to this growth too. There was an exponential growth in consumer demand for crop products from the Asia-Pacific region and North America. China, Japan, India, and South Asia saw an increase in sales of herbicides, insecticides and fungicides.

9 Source: <https://www.statista.com/statistics/263785/revenue-distribution-of-bayer-ag-segments-since-2007/>

Figure 13

**BAYER SALES BY REGIONS, 2018, USD MLN**



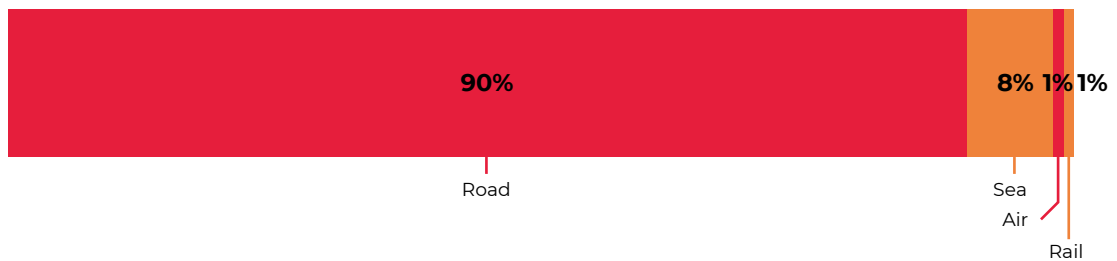
Source: generated by ITI based on Bayer AG data

**LOGISTICS AND TRANSPORT**

Bayer logistics includes not only the transportation and storage of goods, but also management and monitoring of the flows of goods. The bulk of products are currently transported by road, which accounts for some 90%. The company is working on its strategy to reduce CO2 emissions, which means minimizing transportation by air and road and using more environmentally friendly means of transport – by rail and by sea.

Figure 14

**TRANSPORTATION OF GOODS BY THE MEANS OF TRANSPORT, 2018**



Source: Bayer

As the company’s production facilities favorably located of in the EU and Bayer seeks to reduce its CO2 emissions, railway transport can become a basis for the organization of an effective supply chain.

## Dow

In September 2017, DowDuPont reported on the successful completion of the merger of two companies, the Dow Chemical Company (“Dow”) and E.I. du Pont de Nemours & Company (“DuPont”). But the combined business proved to be not all that much effective: the company’s revenues and shares showed weak dynamics; as a result, in June 2019, the corporation’s assets were demerged between three companies Dow, DuPont, and Corteva<sup>10</sup>.

### MANUFACTURING

Dow, an American chemical company, specializes in high-tech materials, agricultural and special-purpose chemical products and plastics. Manufacturing, handling, sales, research and development facilities, as well as regional purchasing and distribution centers are located all over the world. The company is heavily investing in fixed assets. All in all, the company operates 164 production sites in 35 countries. The table below shows the number of production sites by regions.

*Table 1*

#### NUMBER OF DOW MANUFACTURING PLANTS, AS OF DECEMBER 31, 2019

Region	Quantity
USA and Canada	57
Europe, Middle East, Africa	44
A/P	42
Latin America	21
Total	164

Source: Dow 2018 Annual Report

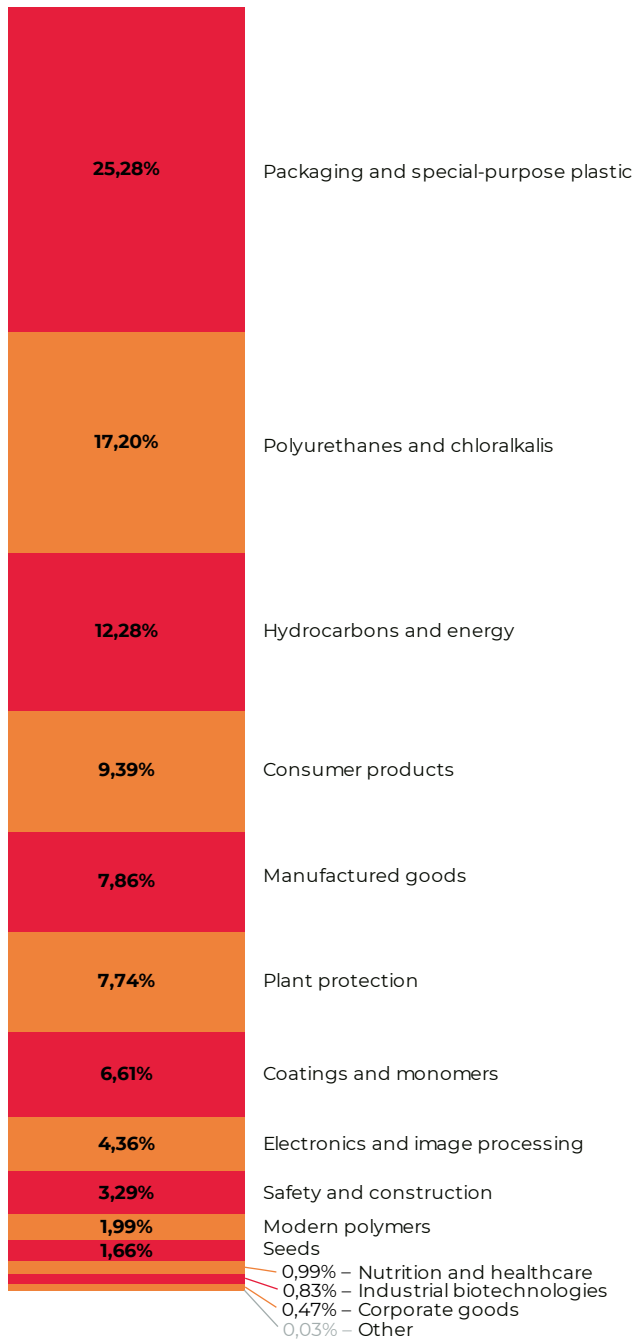
The company also runs production facilities in China, namely: Taiwan, Shanghai, Guangdong province (Sanshui district), Jiangsu province (Zhangjiagang), Sichuan province (Meishan) and other.

Packaging and special-purpose plastics represents a fast-growing product segment due to its widespread use. In 2018, these products accounted for 25% of Dow total sales. In terms of the amount of products sold, they are followed by polyurethanes and chloralkalis with a share of 17% and hydrocarbons and energy (ethylene, propylene, raw materials and energy for manufacturing facilities accounting for 12%. The remaining product groups made some 46%.

<sup>10</sup> Source: <https://quote.rbc.ru/news/article/5cf183aa9a7947dc5e689a19>



**Figure 15**  
**DOW SALES BY PRODUCT GROUPS, 2018**

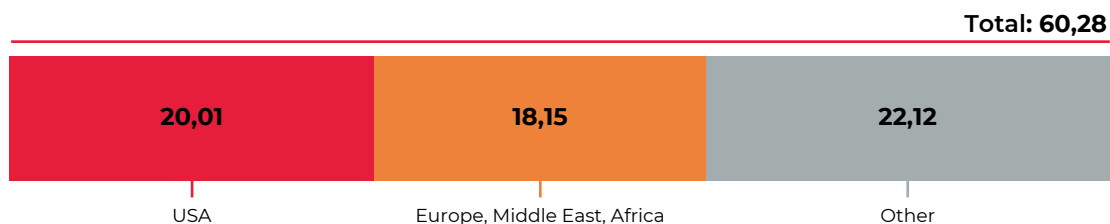


Source: generated by ITI based on Dow 2018 Annual Report

The USA hosts 52 of 164 production sites of the company. This is the reason why the country is the largest manufacturing and consumer market. In 2018, 36% of total sales were made to customers in the USA and Canada, 30% – in Europe, the Middle East and Africa; the remaining 34% of consumers were from A/P and Latin America. The consumer market of chemical products in A/P is boosting. In 2018, the region witnessed the largest increase in the volume of sales of Dow products – 17%<sup>11</sup>.

<sup>11</sup> Dow 2018 Annual Report, page 19

Figure 16

**DOW SALES BY REGIONS, 2018, USD BLN**

Source: generated by ITI based on Dow 2018 Annual Report

**TRANSPORT AND LOGISTICS**

The Dow ValuePark industrial park is located in the east of the central part of Germany, which means good infrastructure for land transportation of cargo. The industrial park hosts Dow partners such as Hoyer GmbH, MitteldeutscheEisenbahn GmbH, MKLMitteldeutscheKunststoff-Logistik GmbH & Co KG which render transport and logistics services.

Hoyer GmbH operates the KTSK bimodal terminal, which is connected to the national and international railway infrastructure and is a gateway to the European market. The terminal can handle up to 100,000 containers per year<sup>12</sup>. Moreover, Hoyer GmbH offers a range of services designed specifically for the chemical industry: storage premises, storing dangerous goods, provision of 3,500 container platforms. In addition, the CotacCompany, which is subsidiary to Hoyer GmbH, renders services in containers cleaning, maintenance, and repair.

MitteldeutscheEisenbahn GmbH is a transport company specializing in rail transportation from the Central part of Germany to the seaports of Germany and to Bavaria. Its shareholders are DB Cargo AG and VTG Retail Logistics GmbH. Dow cooperates with BDP International in part of cargo transportation by sea<sup>13</sup>.

<sup>12</sup> Source: <https://www.invest-in-saxony-anhalt.com/center-of-excellence-valuepark>

<sup>13</sup> Source: <https://www.bdpinternational.com/who-we-serve/our-customers/creating-a-world-of-opportunity>

## Du Pont de Nemours<sup>14</sup>

Du Pont de Nemours has been an individual organization from mid-2019 in the period between 2017 and 2019, it was part of the American DowDuPont conglomerate.

### MANUFACTURING

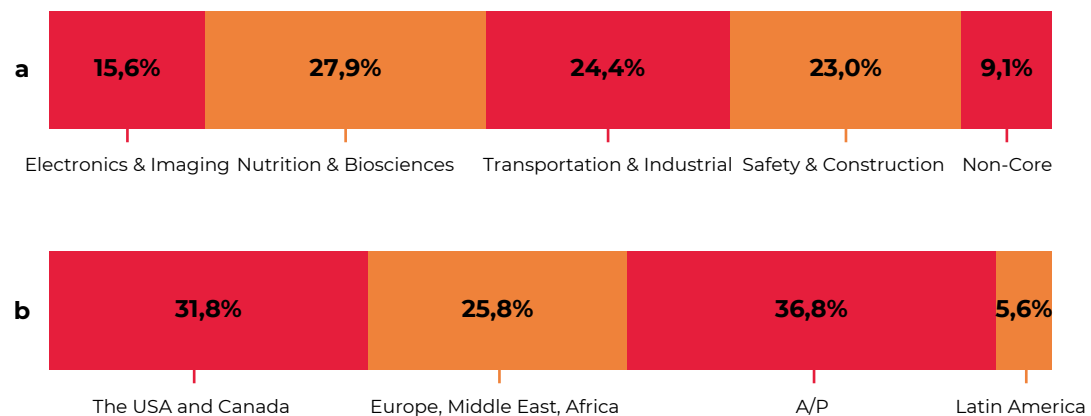
Du Pont specializes in modern plastics, adhesives and enzymes sold on end-consumer markets. The company supplies chemicals for the automotive and electronics industries. Due to high cost of production, special-purpose chemicals are most commonly protected by manufacturer's patents. The core brands of Du Pont de Nemours are: Kevlar® (heat-resistant, synthetic, light-weight fiber), Corian® (surface materials), Tyvek® (high-density polyethylene fiber), Sorona® (fiber used mainly in the textile industry), and other.

According to the results of 3Q 2019, there was a significant increase in sales of the Electronics & Imaging segment in the Asia-Pacific region, including the double-digit growth in China. This segment accounted for 15.6% of total sales. The increase in sales of food products and biotechnology was driven by growth in demand for special proteins caused by the rising demand for plant-based meat.

The main market for Du Pont de Nemours products remains the A/P market, primarily China.

Figure 17

#### SALES A) BY PRODUCTION SEGMENTS, B) BY REGIONS, 3Q 2019



Source: Du Pont de Nemours, Report 3Q

The vast geographic footprint is mainly due to the location of the company's assets in more than 70 countries. Du Pont has an extremely wide geographical presence in the EU, with its core manufacturing facilities located in France.

<sup>14</sup> The annual report of a separate company Du Pont de Nemours for 2018 is not available. The account is based on the company's report for quarter 3 of 2019.

## TRANSPORT AND LOGISTICS

Du Pont de Nemours has been working with Kenco Logistics, a major American logistics company, starting from 1967. Du Pont also cooperates with Elemicalnc in part of supply chain management. Elemica provides a full set of supply management services, including stock management, delivery schedules control, logistics operations management, etc. The Pioneer Company, a subsidiary of Du Pont, works with the Terminal Group of Companies, which operates as a customs broker in the Central and Southern regions of Russia.

BDP International is another major provider of transport services for Du Pont. Their cooperation dates back to 2005, when the countries of the Gulf of Mexico suffered damaged as a result of hurricane Katrina. Today, BDP provides Du Pont with transportation services for exported and imported goods<sup>15</sup>.

# — LyondellBasell Industries

## MANUFACTURING

LyondellBasell Industries N.V. is a major American independent chemical company founded in 2009. Its production facilities consist mainly of processing plants that convert large volumes of liquid and crude gasiform hydrocarbons into plastic resins and other chemicals.

The company operates in five segments:

- Olefins and Polyolefins – Americas (O&P – Americas) is engaged in production and sale of olefins and by-products, polyethylene and polypropylene in South and North Americas.
- Olefins and Polyolefins – Europe, Asia, International (O&P – EAI) is engaged in production and sale of olefins and by-products, polyethylene and polypropylene in Europe and Asia.
- Intermediates and Derivatives (I&D) is engaged in production and sale of propylene oxide and its derivatives, oxygen fuel, and intermediate chemicals such as styrene monomer, acetyl, ethylene oxide and ethylene glycol.
- Advanced Polymer Solutions (APS) – engineering plastics and composites, coloring agents and powders, modern polymers.
- Refining – processing of crude oil on the US coast of the Gulf of Mexico, production of refined products, including gasoline and distillates.

<sup>15</sup> Source: <https://www.bdpinternational.com/who-we-serve/our-customers/duPont-case-study5>

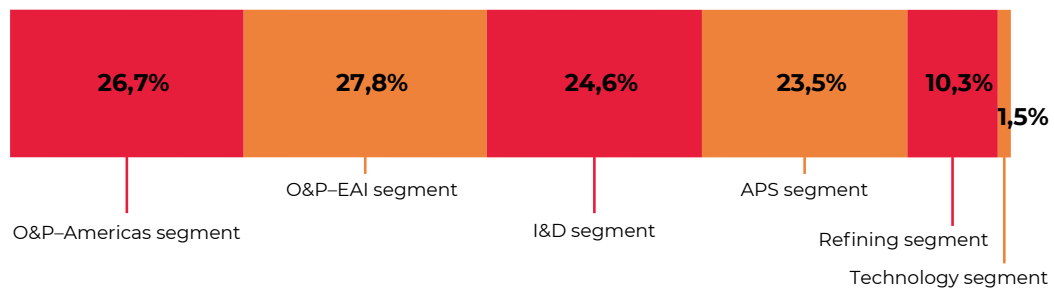
According to the reported data, in 2018, the company ranked fifth among the largest ethylene producers in Europe (4.3 bln pounds per year), the largest polypropylene producer in Europe (5.8 bln pounds per year), and the largest polyethylene producer in Europe (4.8 bln pounds per year)<sup>16</sup>.

The American company operates 55 production sites in 25 countries. According to the 2018 annual report, there are 15 enterprises located in the EU. These manufacturing sites are conveniently located in terms of transport and logistics infrastructure, namely in terms of their access to sea or river. In this regard, we can conclude that the bulk of produced products and/or raw materials is exported and imported by sea, which implies certain risks. For example, in 2018, the O&P – EAI segment was affected by low water levels on the Rhine river and the restrictions on raw material supply in Munchsmunster, Germany. There was a similar problem facing the BASF Company.

The company generates its primary income from the production of olefins and by-products, polyethylene and polypropylene in Europe and Asia. Almost concurrently, the similar segment in America generates income of 26.68% of total sales.

Figure 18

#### LYONDELLBASELL INDUSTRIES N. V. SALES BY PRODUCT SEGMENTS, 2018



Source: generated by ITI based on data from LyondellBasell Industries N.V. Annual Report 2018

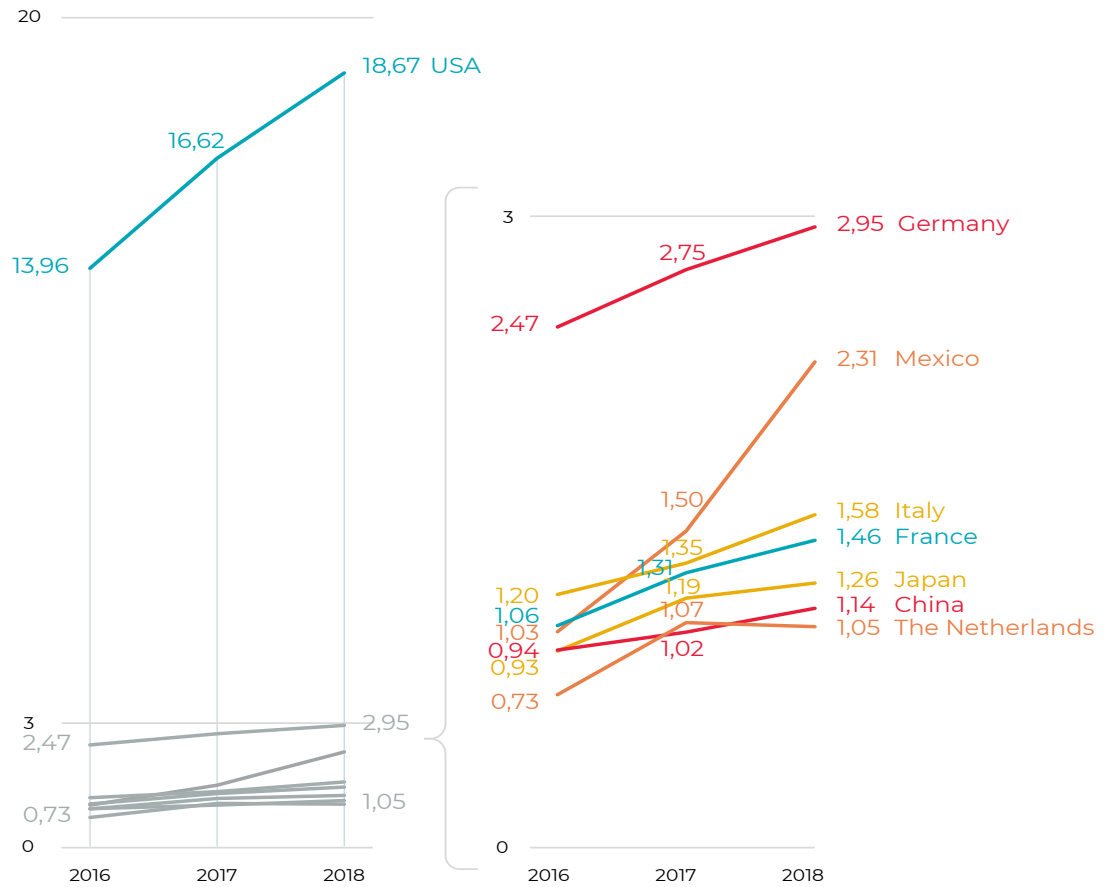
In China, production facilities are located in Guangzhou, Dalian and Suzhou. In total, the company generates much of its revenue from business in developing countries, especially in A/P and South American markets. Any changes on these markets, especially in China, which is a key market for the company, affect the volume of product exports<sup>17</sup>. However, at the end of 2018, China ranks 7th in terms of products sold in the domestic market (2.9% of total sales). In 2018, LyondellBasell Industries N. V. sales in China amounted to USD 1.14 bln, which was 21% more compared to 2016.

16 Source: <https://sec.report/Document/0001489393-19-000011/a2018q410k.htm#s1E41F5B478072473576E8CD3E F92F9A1>

17 Source: <https://sec.report/Document/0001489393-19-000011/a2018q410k.htm#s1E41F5B478072473576E8CD3E F92F9A1>

Figure 19

LYONDELLBASELL INDUSTRIES N. V. SALES BY REGIONS, USD BLN



TRANSPORT AND LOGISTICS

Regional sales offices of LyondellBasell Industries N.V. are located all around the world, including such countries as the Netherlands, Hong Kong, China, India, Australia and the United Arab Emirates (the UAE). The company makes sales through a network of its regional offices in Europe, Asia and Africa. Polypropylene and polyethylene products are usually sold through a supply chain to long-established customers and distributors serving both domestic and export markets. Polyolefins produced by LyondellBasell Industries N.V. are generally transported by rail or road. The company’s intermediate chemicals are delivered by sea, pipelines, vans and tankers.

There is a huge logistics center located in Botlek, on one of the production sites LyondellBasell in Rotterdam. In addition to a plant, the industrial site includes an independent inland port and its own railway cargo terminal, as well as a deep-water terminal.

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## Conclusion

The EU is the largest chemicals supplier after China. The chemical industry is export-oriented. Primarily, the EU exports its products to such countries as the United States, Switzerland, China, Russia, Japan, Turkey, Canada, Brazil, the Republic of Korea, Australia, Mexico and India. Besides, the exporting countries are major manufacturers too.

The EU-China chemical trade is developing steadily, with the EU's surplus in trade with China. At large, the EU's exports to China consist of medicines, immunological products, blood, blood fractions and cosmetics. Transportation of these goods is intermediated mainly by sea transport, with railway transport accounting for less than 1% of the total volume of the goods transported, which suggest the untapped potential of this means in the transportation of chemicals from Europe to China.

Chemical products bear specific features defining the rules and the means of their transportation. At present, all companies with manufacturing production in the EU transport their products by road. This indicated that the demand for short-distance transportation exceeds the demand for long hauls: internal trade between EU member states; trade with other European partner countries outside the EU (located in geographical proximity to the producing countries); internal transport connection between chemical enterprises and their distributors. By now, European chemical manufacturers prefer sea transport when choosing a means of transport for exporting the goods to third countries. This is proven i. a. by the geographical location of their production capacities in the cities with direct access to sea or river transport. We should note the importance of manufacturing countries such as Germany and the Netherlands, which, in addition to an advanced production base, boast a convenient and developed transport infrastructure.

It is typical for EU chemical producers (and in other part of the world too, in general) to have "own" logistics operators under their control. But such operators mainly specialize in road transportation of cargo and they have their own fleet for this activity. International long-haul transportation is carried out by combining own logistics capabilities with third-party partners providing transport services.

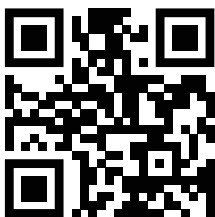
There is a potential for the railway transport to grow in the volume of chemical products transported, since the bulk of such goods can be transported in containers. In addition, the railway transport is more favorable for the transportation of pharmaceuticals (the core product exported by the EU to China) compared to marine transport, since railway transport is several times faster.

Despite it that every major chemical colossus has established its manufacturing facilities in China, the domestic capacity is currently unable to fully satisfy the local demand. This particularly applies to such chemicals as biodegradable polymers, polyester fiber, ethylene and propylene.

Thus, there is a potential for the chemicals produced in the EU to be transported to China by rail, taking into account all the requirements for the transportation. On top of this, the current-day corporate environmental policy of all competitive chemical producers in the EU, as well as of consumers of such products in China, can facilitate transition to the stage when railway transport will become a key source of streamlining the transport costs, safety and speed.

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