



European Flexible Polyurethane Foam Market

REPORT FY 2023

23

August 2024

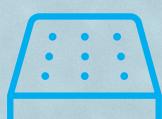
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METHODOLOGY & ACKNOWLEDGMENTS

The information contained in this report is based upon:

- Production data supplied by EUROPUR members producing flexible polyurethane slabstock foam and aggregated in compliance with competition law.
- Interviews with over 60 experts from over 40 industry organisations.
- Data from public sources including ACEA, EU Market Access database, company annual reports and trade press reports.
- Data from consultants and agencies used with their kind permission including CSIL Milano, Tecnon Orbichem, ICIS, Argus Media, IAL and LMC Automotive.

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Several raw materials and machinery companies also provided comments: Bäumer, Covestro, Evonik, Hennecke, Huntsman, Laader Berg, Möller Chemie, Milliken, MOL, PCC Rokita, and Tosoh.

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More detailed reports on raw materials markets, the mattresses and furniture markets or the automotive market can be purchased from the companies Tecnon Orbichem, ICIS, Argus Media, CSIL Milano, IAL and LMC Automotive.

EXECUTIVE SUMMARY

The year 2023 exceeded expectations for the flexible polyurethane industry. Total production of flexible polyurethane slabstock foam (both ether and ester) across the European continent — including Eurasia and Türkiye — reached 1.37 million tonnes, marking a 1.2% increase compared to 2022. However, this growth was uneven, reflecting significant regional disparities. While Western Europe experienced substantial declines in production, Eastern and Southern Europe maintained steady levels overall. Notably, medium and small foam manufacturers performed better than their larger counterparts, with customer portfolios playing a more critical role in their success. Larger volume end-users faced the most significant downturns in 2023. It is also worth noting that production volumes in 2023 were similar to those seen in 2019.

A deeper analysis reveals a more complex situation. The European Economic Area (EEA) and the United Kingdom (UK) experienced a 5% decrease in production, which was offset by significant growth in Eurasia (+41%) and Türkiye (+8%). These regions, to a large extent, represent closed markets for continental European foam producers. Excluding Eurasia — comprising Russia, Ukraine, Belarus, Kazakhstan, and Uzbekistan — the overall market would have shown a decline.

Türkiye stands out as a key exception. It has become the largest flexible slabstock polyurethane foam producer in Europe by the number of production facilities, with 29 plants operated by 25 different companies. The production capacity of these units varies widely, ranging from approximately 100 tonnes to 25,000 tonnes per year.

In 2023, the flexible polyurethane foam industry experienced less turbulence compared to 2022, marked by improved raw material supply chains but also weak and stagnant demand. The industry continued to grapple with rising costs across all sectors, including energy, labour, and chemical raw materials. While overall demand declined, the automotive sector showed some signs of recovery, although demand for electric vehicles remained weak.

The e-commerce sector, particularly in "bed-in-a-box" mattresses, saw demand stagnate in 2023 after several years of robust growth. Additionally, there were reports of Europe beginning to see imports of finished goods from Asia being relabelled.

For mattresses, the European industry is increasingly affected by international trade issues. European manufacturers are progressively losing access to the US market, one of the EU's main export markets due to anti-dumping procedures against several EU member states, while at the same time imports from China strongly increase, in particular for cellular plastic mattresses.

The low demand that defined 2023 carried over into the first two quarters of 2024, with no indication of a significant recovery. Despite some improvement in the automotive sector, a broad-based recovery across the primary markets for flexible PU foam appears unlikely. A survey conducted during our conference in Istanbul in June 2024 predicted low single-digit growth for the full year of 2024.

Table 1: DATA SUMMARY OF FLEXIBLE POLYURETHANE FOAM PRODUCTION FOR 2023, IN EU27, UK, NO, CH, TR AND THE REST OF EUROPE

| TOTAL PU FLEXIBLE FOAM PRODUCTION | | 1,594,126 tonnes |
|--|--|-------------------------|
| Total PU Slabstock Foam Production | | 1,370,315 tonnes |
| Total POLYETHER Slabstock Foam Production | | 1,321,552 tonnes |
| Total POLYESTER Slabstock Foam Production | | 48,763 tonnes |
| Total PU Moulded Foam Production | | 223,811 tonnes |
| Total Number of Continuous Foaming Plants | | 173 |
| Estimated Full Time Employees in PU Foam Production | | 24,380 FTE |
| Estimated PU Foam Industry Turnover: | | 5.1 billion EUR |

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1. INTRODUCTION AND CONTEXT

Overall, production of polyether slabstock foam increased by 1.8% across Europe. However, within the European Economic Area (EEA) and the United Kingdom (UK), production decreased by 5%. Excluding Eurasia, the production contracted by 2.3%. This performance was significantly better than the double-digit decline initially predicted at our conference in Budapest, in June 2023.

In total, 1.59 million tonnes of flexible foams (both moulded and slabstock) were produced in 2023. Of this, 1.37 million tonnes were slabstock foams, which includes 1.32 million tonnes of polyether slabstock foam and 48,763 tonnes of polyester foams. This represents an increase of 72,437 tonnes of slabstock foam compared to 2022. Members reported that challenges persisted throughout 2023, affecting both supply and demand.

Indeed, 2023 was a more stable year compared to the pandemic years, with improvements in raw material supply chains, though demand remained weak and stagnant. The industry continued to face rising costs across all sectors, including energy, labour, and chemical raw materials. While overall demand decreased, the automotive sector showed continuing signs of recovery, although demand for electric vehicles continued to be weak.

General market trends which were observed and reported by members for 2023 were:

- a) Producing to a price point became more important, this caused strong pressure to rationalise product ranges, reduce trim and operate larger production runs to reduce costs.
- b) Margins came again under pressure.
- c) “Design to cost” became a stronger force as designers and OEMs reacted to the forthcoming EoL (End of life) pressures.
- d) The wider use of springs and hybrid models in the mattress industry were reported but not totally supported by the current data.
- e) Imports from Asia Pacific both in raw materials and finished goods played a larger role in the EUROPUR market area.
- f) Continued work to improve the sustainability of the products produced by members of the association.

According to CSIL, the upholstered furniture market represented approximately 16% of global furniture consumption in 2023, maintaining the same share as in 2022. Total sales were estimated at \$73 billion, down from \$80 billion in 2022.

The year saw a notable decline in demand — particularly in the latter half — due to reduced consumer spending power, especially in Europe. CSIL reports a 9.6% contraction in the global market for 2023. Despite this decline, production levels remained at or above pre-pandemic levels.

According to CSIL data, the global mattress market was valued at approximately \$30 billion in 2023, a slight decrease from \$31 billion in 2022. Over the past decade, the market has experienced modest growth, averaging around 2% annually.

In contrast, as supply chain issues eased, the global automotive market saw a significant rebound in 2023, growing by nearly 10% and exceeding 72 million units. LMC Automotive reported that global light vehicle production increased from 82.5 million units in 2022 to 90.8 million units in 2023, marking a 10% rise. Forecasts for the global light vehicle market predict a 1% growth in 2024 and a 3% increase in 2025.

In 2023, the extreme conditions experienced since 2019 began to stabilize, although the situation did not return to pre-pandemic norms. The market for the three major raw materials — TDI, MDI, and polyether polyol — remains global, with changes in one region affecting others.

The wider European region now hosts 173 continuous foaming plants. The trend toward vertical integration slowed, with the addition of new capacities often postponed or delayed throughout 2023. Further investments in new foam lines are being considered in Poland, Spain, Türkiye, Russia, and Belarus. However, projects in the Eurasian region are currently on hold due to ongoing uncertainties related to the war between Russia and Ukraine, with companies increasingly adopting “onshoring” strategies to mitigate supply chain risks.

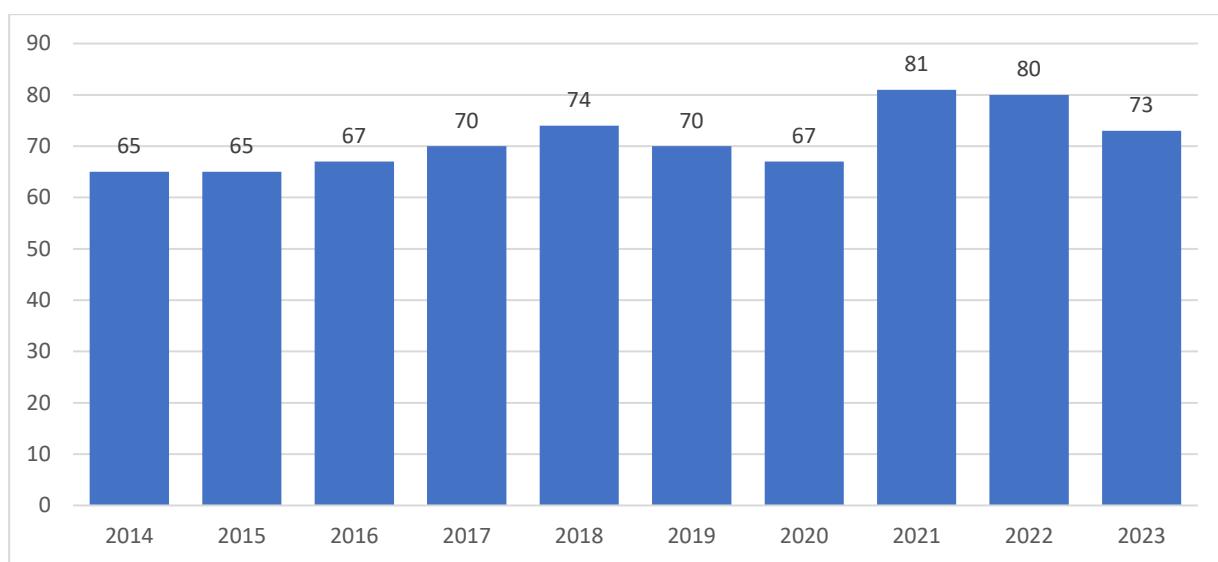
The estimated total turnover of the European flexible slabstock industry in 2023 was EUR 5.1 billion, with approximately 24,000 full-time equivalents (FTEs).

2. PRODUCTION, TRADE AND CONSUMPTION OF FLEXIBLE SLABSTOCK BY END-USE

2.1. Upholstered Furniture

According to CSIL data, the global upholstered furniture market accounted for approximately 16% of the total global furniture consumption in 2023, maintaining the same share as in 2022. The estimated total sales for this upholstered furniture global market in 2023 were around \$73 billion. This represents an 8% decline from the previous year's figures, bringing the market closer to pre-pandemic levels, but still below the 2018 peak of \$74 billion.

Chart 1: GLOBAL CONSUMPTION OF UPHOLSTERED FURNITURE. 2013-2023. Currency USD billion



Source: CSIL

In 2023, Asia Pacific and North America continued to be the leading markets for upholstered furniture. Asia Pacific accounted for 38% of global consumption, North America 30%, Europe 26%, and other regions 6%. Among individual countries, the United States remained the largest single market for upholstered furniture, increasing its share at the expense of Europe. However, the U.S. market experienced a 14% decline in 2023 compared to 2022, largely due to weak performance in the local housing market. China, the second-largest market, remained stable. In contrast, India showed strong growth, with a 5% increase compared to 2022.

There was a continued shift in the composition of furniture consumption across most major markets in 2023, driven by decreased demand for commercial and office furniture. However, growth in domestic upholstered furniture is anticipated to rise in Asia Pacific in 2024. The expected growth rates for 2023 and 2024 are outlined below.

Table 2: UPHOLSTERED FURNITURE CONSUMPTION IN LARGE MARKETS, 2023-2024. Forecasts of yearly changes in real terms (%)

| Country | Real Change 2023 | Forecast 2024 |
|----------------|------------------|---------------|
| Australia | -1% | 1% |
| Canada | -2% | 0% |
| China | 2% | 2% |
| France | -3% | 1% |
| Germany | -3% | 0% |
| India | 4% | 5% |
| Italy | -3% | 1% |
| Japan | 0% | 1% |
| Netherlands | -4% | 1% |
| South Korea | 0% | 1% |
| United Kingdom | -4% | 0% |
| United States | -2% | 1% |

Sources: CSIL, IAL, Economist, B&P Ltd.

According to various organizations including CSIL, IAL, Economist, and B&P Ltd, the global upholstered furniture market is expected to stabilize and exhibit low single-digit growth in 2024. The strongest growth is anticipated in the Asia Pacific and Middle Eastern regions, while other major markets are expected to stabilize. After a contraction in 2023 and a challenging 2024, a modest growth of 1.7% is forecasted for 2025.

CSIL reports that approximately 79% of global upholstered furniture consumption occurs in ten major markets: the United States, China, Germany, the UK, India, France, Canada, Australia, Italy, and the Netherlands.

Global production of upholstered furniture remains highly concentrated, with six countries — China, the United States, Poland, Vietnam, Italy, and India — accounting for approximately 77% of total output. This concentration underscores Europe's continued strong position in the global upholstered furniture industry.

The top 100 global manufacturers collectively contribute to about 25% of global production. Over the past five years, the industry has experienced significant consolidation, particularly in China. Chinese manufacturers have increasingly invested in lower-cost Asian countries, such as Vietnam and more recently India, to enhance their competitiveness.

Other manufacturers have established manufacturing units close to large markets, such as Europe and the USA. The majority of this investments is driven by reducing supply chain disruptions, mitigating the risk of US-imposed tariffs whilst benefitting from lower labour costs locally. Examples of this are Kuka's acquisition of Rolf Benz in Germany and investments in Mexico, Quimei's acquisition of Ekornes in Norway and Man Wah's purchase of the Home Group who has facilities in Poland, Baltic States, Ukraine and recently Mexico.

A notable trend is the establishment of "Design Centres" and exhibitions¹, particularly in Italy and within the high-end furniture segment. However, some of these projects are being reassessed due to the ongoing war between Ukraine and Russia, which has increased the risks associated with relocating production further east. Additionally, U.S. tariff risks have heightened interest in investing in Mexico.

Overall, Europe (including Central-Eastern Europe outside the EU) is estimated to produce 20% of the world's upholstered furniture, while the United States accounts for approximately 17%. This represents a slight decline compared to previous years.

According to the European Furniture Industry Confederation (EFIC), the EU furniture industry employed more than 900,000 people across 115,500 enterprises, making products worth 112 billion EUR in 2023. The industry, despite the low-cost trend, still benefits from high quality and leading design images.

2023 again saw the growing importance of digitalisation, the Internet of Things (IoT), Industry 4.0 and End of Life issues, all having a major effect on the furniture industry prompting further investment in recycling processes.

CSIL estimates that e-commerce accounts for 9% of furniture sales in Europe, with the UK and Germany leading with penetration rates of approximately 11% and 9%, respectively. This trend is expected to continue growing as companies seek to lower their cost bases.

Regarding market strategies, manufacturers and retailers are increasingly collaborating to enhance the customer experience and address supply chain issues more effectively.

Table 3: WORLD PRODUCTION, EXPORT, IMPORTS AND APPARENT CONSUMPTION OF UPHOLSTERED FURNITURE (in USD million) – FY 2023

| | | Production | Exports | Imports | Apparent Consumption | Production to Apparent Consumption |
|---|---------|------------|---------|---------|----------------------|------------------------------------|
| EU (27), UK, Norway, Switzerland and Iceland | | 18,624 | 11,916 | 12,265 | 18,973 | 98% |
| of which | France | 577 | 241 | 1,754 | 2,090 | 28% |
| | Germany | 2,120 | 816 | 2,587 | 3,891 | 54% |
| | Italy | 3,541 | 2,613 | 16 | 944 | 270% |
| | Poland | 4,112 | 3,841 | 284 | 555 | 741% |
| | UK | 2,089 | 159 | 1,701 | 3,631 | 58% |
| Central-East Europe outside the EU and Russia | | 1,754 | 1,141 | 163 | 776 | 200% |
| of which | Turkey | 1,372 | 702 | 74 | 744 | 184% |
| Asia and Pacific | | 44,234 | 19,937 | 3,587 | 27,884 | 159% |
| of which | China | 34,266 | 15,543 | 307 | 19,030 | 180% |
| | Japan | 142 | 18 | 861 | 985 | 14% |
| Middle East and Africa | | 759 | 77 | 1,609 | 2,291 | 33% |
| North America | | 14,932 | 2,254 | 9,545 | 22,223 | 67% |

¹ Milan Design Week and Salone del Mobile, Design Centre at Chelsea Harbour or Maison&Object or other more industrial scale oriented centres.

EUROPEAN FLEXIBLE PU FOAM MARKET - REPORT FY 2023

| | | | | | | |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|-------------|
| of which | United States | 12,990 | 843 | 8,054 | 20,201 | 64% |
| | Canada | 758 | 436 | 1,244 | 1,566 | 48% |
| | Mexico | 1,184 | 975 | 247 | 456 | 259% |
| South America | | 1,044 | 86 | 129 | 1,087 | 96% |
| WORLD TOTAL (70 countries) | | 81,347 | 35,411 | 27,298 | / | 111% |

Source: CSIL, used with kind permission, and own calculations.

The data above reflects the absolute turnover for the production and export of upholstered furniture, as well as the import and apparent consumption reality. The table below details the production of upholstered furniture by primary producers within the EUROPUR region (Wider Europe).

It is apparent from the data that production values have declined across most countries, with the notable exception of Greece. Despite significant price increases driven by escalating costs, this decline has slowed, and in some cases, production has stabilized or even grown in certain countries.

Table 4: CHANGES IN UPHOLSTERED FURNITURE PRODUCTION IN MAJOR EUROPEAN ECONOMIES 2019 - 2023 (in USD million)

| EU16 Country | 2019 | 2020 | 2021 | 2022 | 2023 | 2023/2022 (% Change) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| Austria | 155 | 132 | 152 | 145 | 145 | 0.00% |
| Belgium | 293 | 275 | 328 | 318 | 299 | -5.97% |
| Denmark | 434 | 461 | 561 | 557 | 555 | -0.36% |
| Finland | 116 | 114 | 130 | 129 | 121 | -6.20% |
| France | 543 | 518 | 617 | 571 | 577 | 1.05% |
| Germany | 1,992 | 1,990 | 2,527 | 2,151 | 2,120 | -1.44% |
| Greece | 18 | 15 | 17 | 17 | 22 | 29.41% |
| Ireland | 70 | 65 | 68 | 63 | 68 | 7.94% |
| Italy | 2,584 | 2,693 | 3,502 | 3,555 | 3,541 | -0.39% |
| Netherlands | 567 | 666 | 691 | 657 | 594 | -9.59% |
| Norway | 174 | 163 | 215 | 196 | 159 | -18.88% |
| Poland | 3,717 | 3,656 | 4,535 | 4,101 | 4,112 | 0.27% |
| Portugal | 262 | 235 | 307 | 317 | 347 | 9.46% |
| Spain | 665 | 617 | 768 | 756 | 807 | 6.75% |
| Sweden | 461 | 451 | 532 | 507 | 456 | -10.06% |
| Switzerland | 110 | 93 | 112 | 106 | 110 | 3.77% |
| United Kingdom | 1,925 | 1,683 | 2,166 | 2,122 | 2,089 | -1.56% |
| Total | 14,086 | 13,827 | 16,990 | 16,268 | 14,033 | -13,74% |

Source: CSIL World Upholstered Furniture Report 2023, provisional data, including adjustments for previous years, used with kind permission

Table 5: CHANGES IN UPHOLSTERED FURNITURE PRODUCTION IN THE REST OF EUROPE 2019-2023 (in USD million)

| European Country | 2019 | 2020 | 2021 | 2022 | 2023 | 2023/2022 (% Change) |
|--------------------|-------------|-------------|-------------|-------------|--------------|-------------------------|
| Bosnia Herzegovina | 215 | 220 | 266 | 268 | 252 | -5.97% |
| Bulgaria | 56 | 56 | 82 | 83 | 79 | -4.82% |
| Croatia | 110 | 103 | 122 | 111 | 104 | -6.31% |
| Czech Republic | 335 | 332 | 404 | 393 | 371 | -5.60% |
| Estonia | 543 | 518 | 617 | 151 | 127 | -15.89% |
| Hungary | 254 | 238 | 271 | 263 | 251 | -4.56% |
| Iceland | 7 | 5 | 5 | 5 | 4 | -20.00% |
| Kazakhstan | 7 | 6 | 8 | 8 | 9 | 12.50% |
| Latvia | 18 | 19 | 28 | 33 | 30 | -9.09% |
| Lithuania | 443 | 461 | 591 | 523 | 511 | -2.29% |
| Malta | 14 | 14 | 14 | 12 | 11 | -8.33% |
| Romania | 694 | 647 | 819 | 798 | 745 | -6.64% |
| Russia | 522 | 463 | 591 | 508 | n.a | |
| Serbia | 84 | 78 | 92 | 105 | 130 | 23.81% |
| Slovakia | 199 | 189 | 218 | 207 | 185 | -10.63% |
| Slovenia | 73 | 66 | 79 | 76 | 73 | -3.95% |
| Turkey | 909 | 903 | 1.172 | 1.255 | 1.372 | 9.32% |
| Ukraine | 174 | 174 | 223 | 131 | n.a | |
| Total | 4657 | 4492 | 5602 | 4930 | 4254 | |

Source: CSIL World Upholstered Furniture Report 2023, provisional data, including adjustments for previous years used with kind permission.

It should be noted that the above charts are presented in million USD for comparative purposes, whereas figures prior to 2022 were reported in Euros. This adjustment ensures better comparability. Additionally, please be aware that data for Russia and Ukraine is not available for 2023.

2.2. Mattresses

According to data from CSIL, the global mattress market reached a value of approximately USD 30 billion in the year 2023. This is a small reduction from the USD 31 billion figure for 2022. Over the past decade the global mattress market has followed a slow growth pattern, increasing by around 2% per annum. The global market has been somewhat distorted by the pandemic showing an 18% growth in 2021 over 2020, followed by a 9% decrease in 2022 and a further 3% contraction in 2023.

In 2023, the largest global market is Asia-Pacific (39%), followed by North America (34%). North America grew at the expense of Europe, which in 2023 has a 20% share of the global market

(19% in 2022), but still a decrease of around 2% since 2014. The other regions ranged at 7%. Overall markets were returning to their pre-pandemic levels in all regions with the exception of South America.

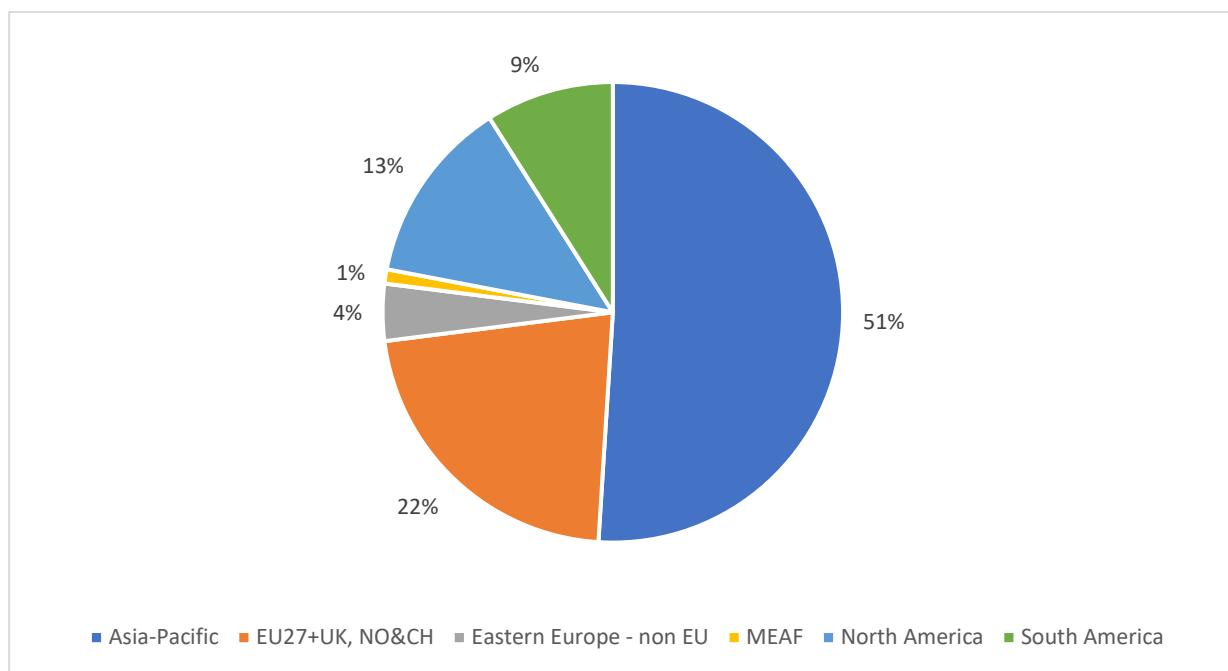
The largest single countries in terms of consumption are the United States and China, which together account for 60% of the global consumption. In 2023, the U.S. market contracted by 7% due to a weak housing sector, while China experienced a more moderate decline of 2% compared to 2022, a significant improvement from the double-digit slowdown of the previous year. India emerged as one of the fastest-growing markets, with a 10% increase over 2022. Additionally, Mexico and Türkiye are also among the top global mattress producers.

According to CSIL, e-commerce increased its share of the market to 23% in 2023, up from 16% in 2019, before the pandemic.

Globally, approximately 220 million mattresses are produced annually. The distribution of production is as follows: 51% in Asia-Pacific, 13% in North America, and 22% in Europe. Growth in the Asia-Pacific region is primarily driven by production in countries such as Indonesia, Vietnam, and Thailand, as well as by Chinese manufacturers relocating production to lower-cost countries. However, this trend may be impacted by U.S. anti-dumping tariffs, which are beginning to affect exports from these regions.

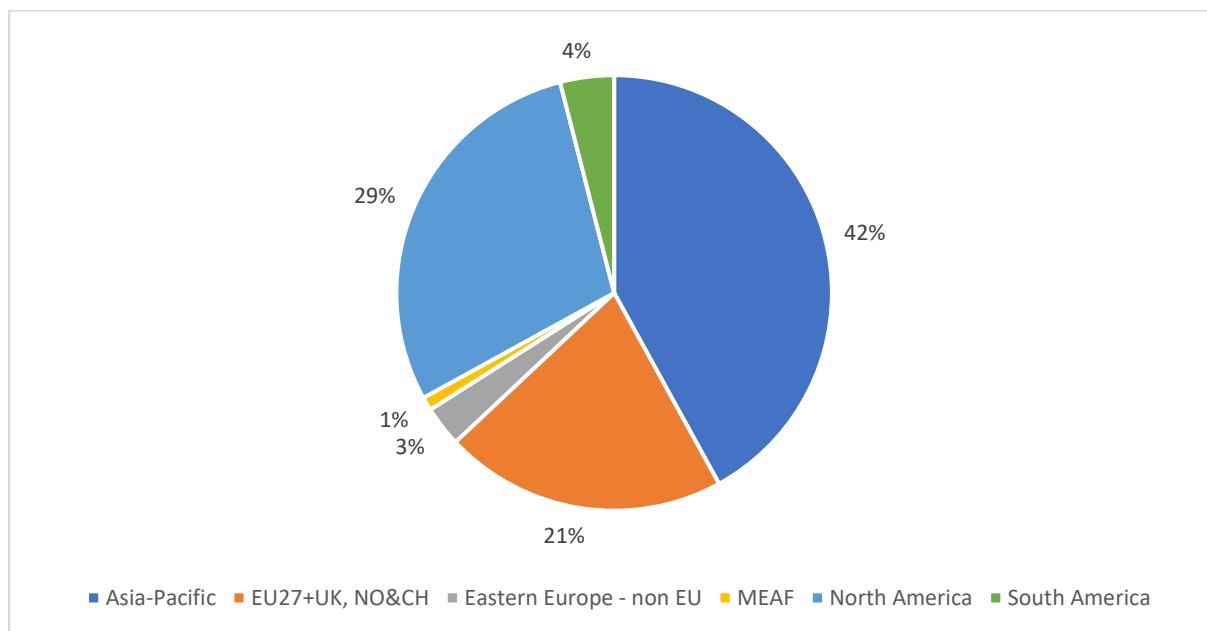
The charts below show the mattress production in number of units and value by region in percentage.

Chart 2: GLOBAL MATTRESS PRODUCTION, in number of units.



Source: CSIL

Chart 3: GLOBAL MATTRESS PRODUCTION, in value.



Source: CSIL

According to CSIL and Frost & Sullivan, the drivers for future global growth remain intact with an increased focus on quality of bedding products and an apparent willingness of consumers to upgrade their bedding in both traditional and emerging markets. There is also increased demand of roll-packed and compresses mattresses in both online and traditional sales channels. The “global contract” segment which was heavily affected by the pandemic has now returned to near pre pandemic volumes.

According to CSIL and Mintel, the Chinese mattress industry demonstrated some recovery in 2023, with a 2% contraction compared to 2022, indicating a return to a more stable market environment.

In wider Europe, production volumes improved in 2023. However, certain countries began to experience the impact of U.S. anti-dumping regulations, which affected their production volumes.

Analysis of data from CSIL for 20 EU countries suggests that there was a marginal change in the types of mattresses produced between 2022 and 2023. Innerspring mattresses accounted for 50% of production, foam mattresses 42%, latex 5% and other types the remaining 3%. Due to the use of official statistics, it is not possible to identify the market share of hybrid mattress, which will be counted in one of the four aforementioned categories.

According to data from the World Economic Outlook and The Economist, mattress production is expected to stagnate in 2024 but resume growth in 2025 of around 2.3%. This will be driven by higher growth in Asia-Pacific and slower growth in Europe and North America.

Foam manufacturers have consistently reported continued challenges in their operations during 2023. Foremost among these challenges were recurring supply chain disruptions, which

posed persistent hurdles. Additionally, the manufacturers grappled with a notable uptick in input costs, with particular emphasis on logistic and inflation driven production costs.

As previously mentioned in the EUROPUR market report FY 2022, the rapid growth in e-commerce during the pandemic has raised the profile of "bed in a box" mattresses and corresponding viscoelastic foam sales. 2023 again showed a consolidation of this trend but also the emergence of producers adopting a "multichannel" sales approach. This caused e-retailers to adapt their market strategies, going towards the use of "off-line" showrooms, temporary "pop-up" stores and establishing partnerships with retailers with an increasing trend to "direct to customer" relationship.

The top 100 manufactures of mattresses accounted for 65% of the global production (CSIL). From the leading 100 companies 44 are based in Asia-Pacific, 22 in Europe and 19 in North America. There is also a trend towards mattress manufactures integrating manufacturing and retailing activities, leading this trend are companies in Europe and the US.

The "bed in a box" market has demonstrated a continual evolution, marked by dynamic shifts in supply chain strategies. Producers within this sector have modified their supply chains, fostering increased collaboration with industry suppliers, who have expanded their roles to provide finished products directly to the market. This evolution is particularly evident in the departure from the initial model of exclusively online sales of 100% polyurethane mattresses.

In contemporary iterations of the "bed in a box" concept, mattresses have evolved to incorporate various elements. These include the incorporation of micro coils and mini-micro coils, the implementation of zippered covers, as well as the adoption of innovative fabrics.

The move to on-line sales platforms occurred throughout the global mattress industry, with ISPA (International Sleep Products Association of America) reporting that in the US on-line sales accounted for 59% of all mattress sales in 2023. One of the most impressive examples of this trend has been again the increase in sales by Amazon. Having entered the market in 2018, the company became the leading on-line seller exceeding USD 1.75 billion in sales by the end of 2023, despite the market stagnation.

The high-end mattress sector continues to demand high quality foams and customers were reported to be very loyal to brands, but even here some foam has been substituted with natural materials and springs for numerous reasons. This is especially prevalent with exports from Europe to both China and the United States.

Some European mattress core manufacturers have continued to find strong demand in export markets, especially where the CertiPUR label is valued. There is also renewed interest in using a small, rebonded foam content in low end mattresses.

The US anti-dumping tariffs' show further impact in 2023 on specific countries e.g. Kosovo, Serbia and Spain and this is expected to continue into 2024. A few more information is given below.

The United States imported mattress to the value of USD 1.3 billion showing an 8.7% decrease in 2022. Interestingly, there were large decreases for Indonesia, Spain, Taiwan, Poland, India & Bulgaria driven in most cases by US Anti-dumping tariffs. An observation was also the increase from Mexico, Myanmar and South Korea. First was Indonesia, Mexico came second, Taiwan

was third and Kosovo fourth. The fifth largest source was Spain. This illustrates the effect of anti-dumping tariffs on Chinese imports.

Table 6: USA IMPORTS OF MATTRESSES OF CELLULAR PLASTICS, (940421 HS Code) 2022 vs 2023 (in USD million)

| Countries | 2021 | 2022 | 2023 | % Change |
|--------------------|--------------|--------------|---------------|--------------|
| Indonesia | 355.7 | 399.49 | 327.86 | -21.85 |
| Mexico | 280.2 | 366.44 | 421.72 | 13.11 |
| Taiwan | 157.7 | 148.01 | 72.71 | -103.56 |
| Kosovo | 92.6 | 136.52 | 87.25 | -56.47 |
| Spain | 57.3 | 56.04 | 23.8 | -135.46 |
| Vietnam | 46 | 45.10 | 44.95 | -0.33 |
| Canada | 47.9 | 39.7 | 25.12 | -58.04 |
| Philippines | 28.3 | 29.8 | 30.41 | 2.01 |
| Poland | 12.2 | 28.9 | 10.2 | -183.33 |
| India | 21.9 | 25.1 | 9.2 | -172.83 |
| Italy | 21.6 | 17.5 | 8.6 | -103.49 |
| Bulgaria | 6.2 | 4.55 | 2.1 | -116.67 |
| Myanmar | 8.3 | 25.87 | 141.45 | 81.71 |
| South Korea | 2.3 | 11.5 | 50.24 | 77.11 |
| Others | 149.8 | 102.48 | 66.39 | -54.36 |
| Total | 1,288 | 1,437 | 1,322 | -8.70 |

Source: USITC, CSIL, ISPA

2.2.1. The U.S. Anti-Dumping Case

Anti-Dumping Case Against EU Mattress Imports: Implications for the EU Market

EU imports and exports of mattresses is increasingly affected by the global geopolitical context. Imports of mattresses into the US, including from several EU Member States, has been challenged under parallel anti-dumping and anti-subsidy investigations. This has largely closed the US market to mattress exports from the EU and other countries. In turn, this may result not only in the loss of a major export market but also in increased imports from third countries affected by this procedure.

A set of stakeholders from the US mattress industry filed a petition in July 2023 to the US Department of the Commerce (DoC) and the US International Trade Commission (ITC) for the imposition of anti-dumping duties on US imports of “mattresses” from different countries, including EU Members States Bulgaria, Italy, Poland, Slovenia, and Spain.

In September 2023, the International Trade Commission (ITC) concluded that there is a reasonable indication that the US mattress industry is materially injured by imports from the specified countries. The examination of the file lasted throughout 2023 and into 2024, where the US Department of Commerce (DoC) and ITC conducted investigations to determine if the

goods were sold at less than fair value or posed a threat of injury due to dumping. In February 2024, the DoC published its preliminary determination, which was followed by the final affirmative determination in early May 2024, resulting in the suspension of liquidation for the subject merchandise and the collection of cash deposits equivalent to the estimated dumping margins. By mid-June 2024, the ITC and DoC finalised their determinations, affirming duties at both individual case levels and country rates, with Poland facing 330%, Slovenia 744%, Bulgaria 106%, Italy 257%, and Spain 10%.

In addition, during this process, a critical circumstances allegation was filed as a tool to counter possible import surges during the early stages of the investigations. In cases where critical circumstances are determined, the Commerce Department has the statutory authority to retroactively suspend liquidation and require cash deposits for entries made before preliminary or final determinations. Furthermore, what was seen in this process was an active participation from political power and authorities in the hearing held by the ITC intended to assess whether an anti-dumping determination on mattress imports will cause material injury, where US Congress members and Senators participated, and contributed via letters and written comments.

The financial implications of this process are already evident, with a significant decrease in EU mattress exports to the US observed in 2023, following the filing of the petition. Between 2022 and 2023, EU exports of mattresses to the US fell by approximately €70 million for categories 940421 and 940429 (spring and cellular plastic / rubber mattresses). This trend is expected to continue into FY2024, causing further injury to the entire mattress industry supply chain. Except the revenue loss, increased internal market competition and potential disruptions of supply chain in terms of raw materials and components might be expected. Especially given the notable ever-increasing imports to the EU from third countries.

2.2.2. Imports and Exports Statistics

An essential parameter around the global trade discussions is the local (EU level) production and consumption, and in particular of mattresses as a reoccurring matter in the PU foam industry. The EU mattress market has experienced significant fluctuations over the past five years. In 2017, the grand total of mattress production was 49,495,666 units, which increased to 50,134,655 units in 2018 and further peaked at 53,021,580 units in 2019. The subsequent years, however, marked a substantial downturn, with production falling to 44,943,620 units in 2022 and further dropping to 39,132,421 units in 2023, as shown in the table below.

Table 7: MATTRESS PRODUCTION IN THE EU PER UNITS, BY MATTRESS CATEGORY, 2017-2023.

| | 2017 | 2019 | 2021 | 2023 |
|--|------------|------------|------------|------------|
| Mattresses of cellular plastics (including with a metal frame) (excluding water-mattresses, pneumatic mattresses) | 17,929,940 | 17,189,455 | 18,000,000 | 11,900,000 |

| | | | | |
|--|-------------------|-------------------|-------------------|-------------------|
| Mattresses of cellular rubber (including with a metal frame) (excluding water-mattresses, pneumatic mattresses) | 5,257,216 | 7,311,810 | 6,400,000 | 4,500,000 |
| Mattresses with spring interiors (excluding of cellular rubber or plastics) | 18,244,606 | 20,246,984 | 19,240,000 | 15,532,421 |
| Mattresses (excluding with spring interiors, of cellular rubber or plastics) | 8,063,904 | 8,273,331 | 7,666,534 | 7,200,000 |
| Grand Total of Production | 49,495,666 | 53,021,580 | 51,306,534 | 39,132,421 |

Source: EUROSTAT

Note: Data from EUROSTAT for the years 2021 and 2023 is rounded up in the official database.

The below table shows the change in production of mattresses in value per country, where data is available. The figures show an overall stagnation which includes a shift towards Türkiye which is again showing significant growth. It is important to acknowledge that, as mattress manufacturers endeavour to enhance operational efficiencies, the relocation of production among facilities across different countries can influence individual country statistics, without necessarily impacting the overall aggregate production volume.

Table 8: PRODUCTION OF MATTRESSES IN EU28+, 2017-2023 (in USD million)

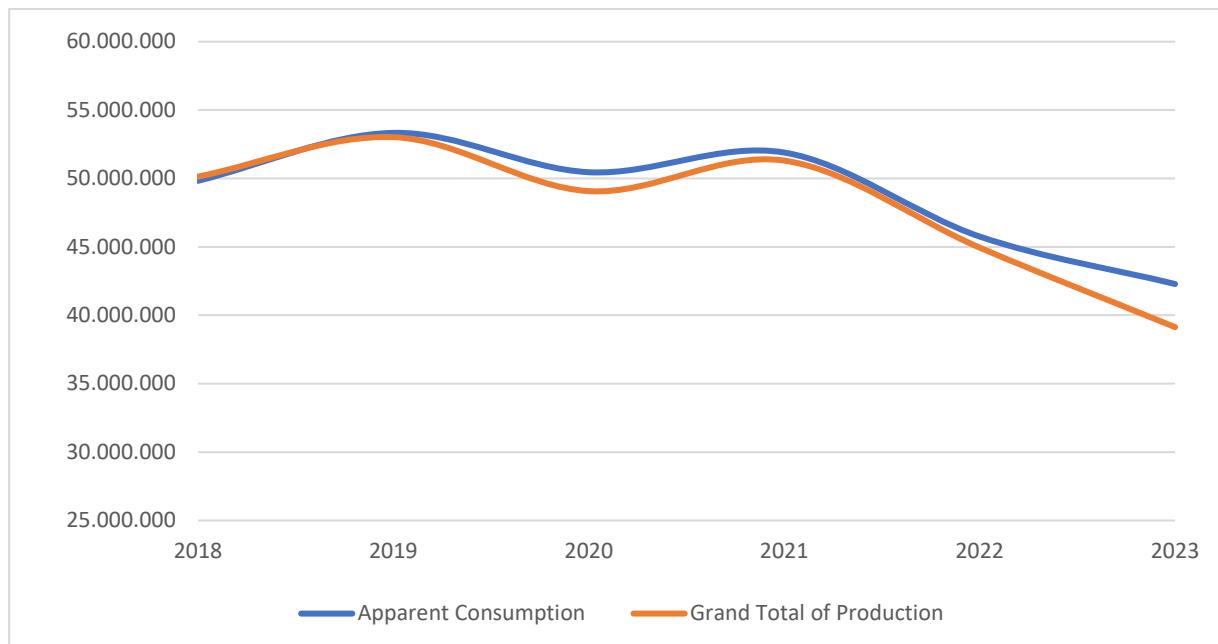
| Country | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | % Change 2022/2023 |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|
| Belgium & Netherlands | 499 | 506 | 483 | 492 | 543 | 448 | 433 | -3.35% |
| Denmark | 280 | 277 | 246 | 281 | 321 | 288 | 281 | -2.43% |
| Finland & Norway | 153 | 151 | 141 | 140 | 161 | 138 | 120 | -13.04% |
| France | 553 | 534 | 523 | 482 | 565 | 497 | 520 | 4.63% |
| Germany & Austria | 712 | 702 | 657 | 657 | 705 | 594 | 583 | -1.85% |
| Greece | 68 | 77 | 72 | 68 | 84 | 81 | 90 | 11.11% |
| Italy | 639 | 678 | 655 | 694 | 835 | 728 | 745 | 2.34% |
| Portugal | 194 | 209 | 208 | 205 | 277 | 244 | 263 | 7.79% |
| Spain | 420 | 500 | 489 | 473 | 609 | 558 | 556 | -0.36% |
| Sweden | 215 | 217 | 208 | 212 | 248 | 219 | 195 | -10.96% |
| Switzerland | 160 | 161 | 156 | 149 | 160 | 151 | 158 | 4.64% |
| UK & Ireland | 765 | 814 | 813 | 699 | 897 | 858 | 842 | -1.86% |
| Bulgaria & Romania | 151 | 182 | 186 | 214 | 337 | 319 | 294 | -7.84% |
| Czech Republic | 67 | 75 | 75 | 74 | 83 | 71 | 66 | -7.04% |
| Poland | 832 | 918 | 885 | 826 | 993 | 884 | 876 | -0.90% |
| Sub Total | 5708 | 6001 | 5797 | 5666 | 6818 | 6078 | 6022 | -0.92% |
| Türkiye | 386 | 343 | 408 | 521 | 595 | 607 | 704 | 15.98% |
| Russia | 276 | 269 | 284 | 284 | 354 | 340 | n.a | |

| | | | | | | | | |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Serbia | 42 | 62 | 111 | 129 | 68 | 84 | 89 | 5.95% |
| Croatia | 55 | 63 | 59 | 54 | 68 | 59 | 65 | 10.17% |
| Estonia | 50 | 53 | 53 | 55 | 57 | 51 | 46 | -9.80% |
| Latvia | 7 | 9 | 9 | 20 | 17 | 16 | 17 | 6.25% |
| Lithuania | 57 | 72 | 64 | 66 | 77 | 67 | 62 | -7.46% |
| Total | 6305 | 6603 | 6501 | 6511 | 7700 | 6962 | 7005 | 0.62% |

Source: CSIL World Mattress Report 2023, including adjustments for previous years, used with kind permission

In parallel, the apparent consumption of mattresses within the EU has shown a similar pattern of fluctuation as the production in units. In 2018, consumption figures were recorded at 49,831,825 units, peaking at 53,332,539 units in 2019. The year 2020 saw a decrease to 50,456,662 units, with a slight increase in 2021 to 51,894,819 units. This was followed by a marked decline in subsequent years, with consumption falling to 45,754,494 units in 2022 and further decreasing to 42,284,984 units in 2023, indicating the challenges experienced by the EU mattress market. It should be noted thought that trade dynamics within the EU mattress market are notably robust, with 93% of trade value occurring within the region.

Chart 4: PRODUCTION AND APPARENT CONSUMPTION OF MATTRESSES IN THE EU, IN UNITS (2018 – 2023).

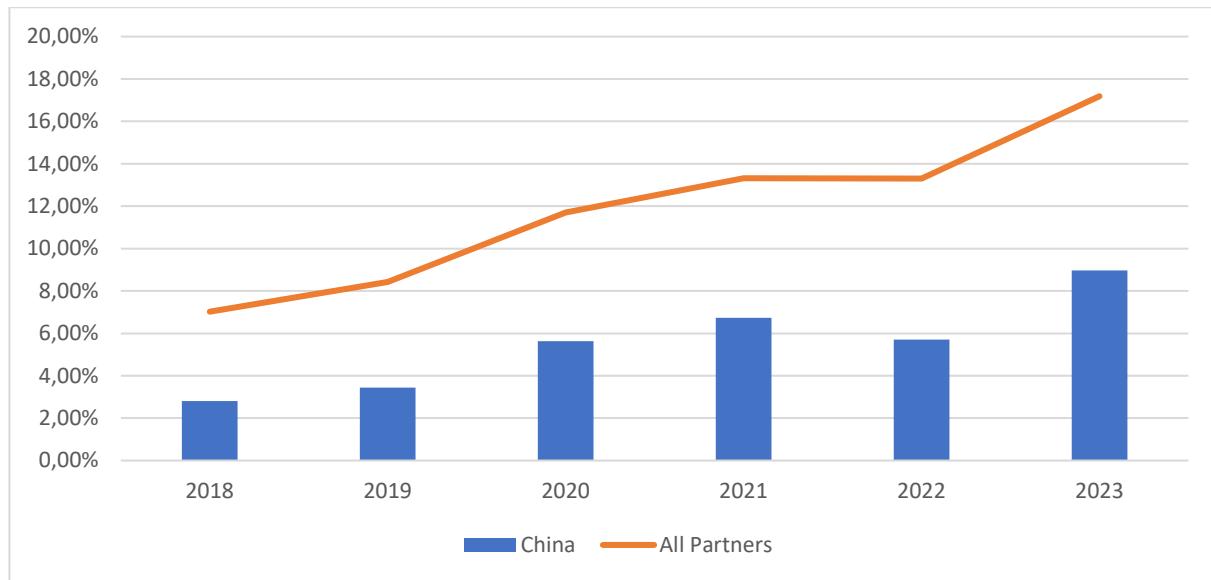


Source: EUROSTAT

Despite the strong internal trade in value, there has been a notable increase in the percentage of imports relative to apparent consumption in the EU. Starting from 7.02% in 2018, the import dependency has progressively risen each year. By 2019, imports accounted for 8.43% of apparent consumption, increasing to 11.70% in 2020, 13.32% in 2021, and 13.30% in 2022. The year 2023 saw the highest import dependency at 17.19%. This rising trend indicates that despite

a strong internal market, the EU is increasingly relying on imports to meet its consumption needs, likely due to the declining domestic production.

Chart 5: MATTRESSES IMPORTS TO THE EU APPARENT CONSUMPTION, PERCENTAGE OF UNITS (2018-2023).

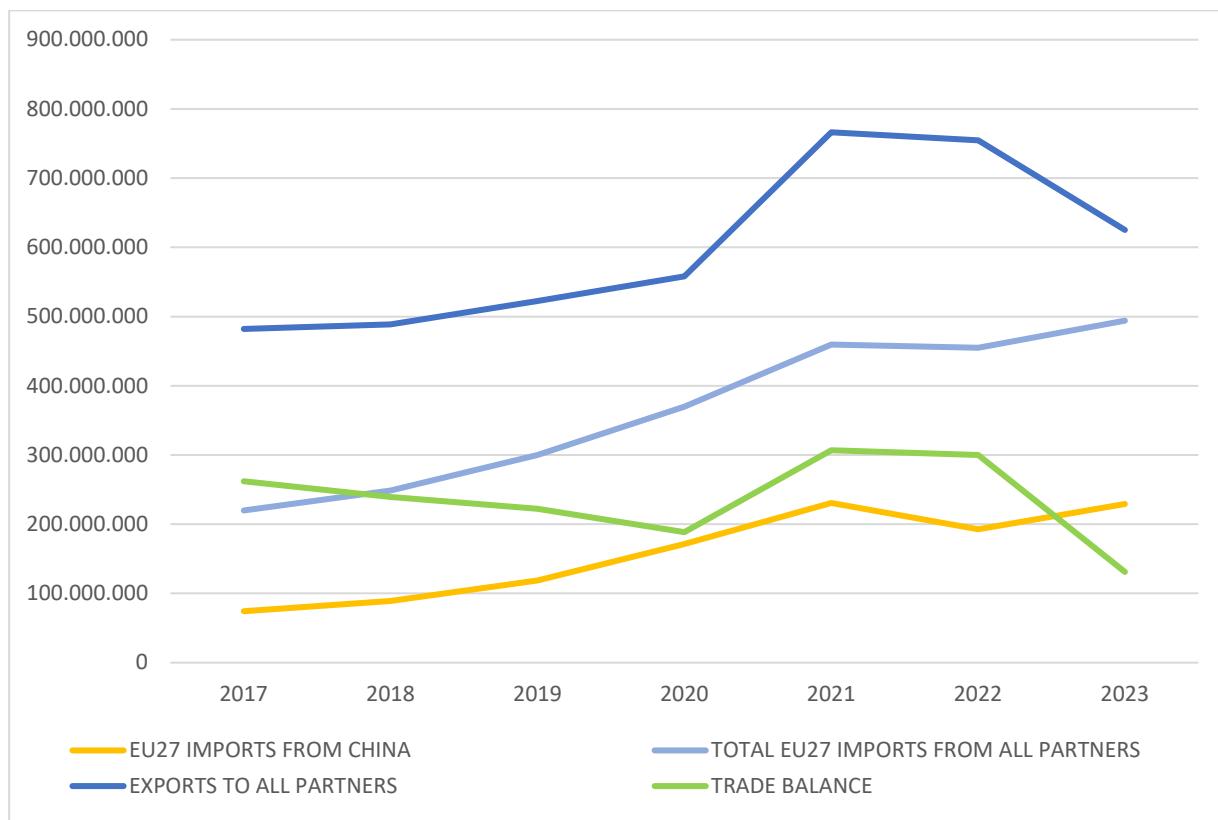


Source: EUROSTAT

The situation becomes even more critical when analysing the different types of mattresses individually. Cellular plastic mattresses (PU foam), in particular, exhibit a significantly higher exposure to imports, with the percentage of apparent consumption covered by imports to have tripled since 2018.

It is, therefore, evident that the European mattress market has experienced significant shifts in recent years and the challenge is set to continue. Examining the imports and exports statistics from EUROSTAT, we see that the value of mattress exports from the European Union decreased from 754 million EUR to 625 million EUR (2022/2023), marking a substantial decline of 129 million EUR or -17%. Notably, exports to the United States fell by 62% or by 70 million EUR between 2022 and 2023, as already mentioned above. Despite this decline, the overall export value remains higher than historical averages. In contrast, mattress imports into the EU have surged, rising from 455 million EUR to 495 million EUR over the same period, which represents a notable increase of 8,7% or of 40 million EUR. The import value over the last five years has been doubled. China has played a pivotal role in this growth, with Chinese mattress imports increasing from 74 million EUR to 229 million EUR since 2017, accounting for 46% of the total imported mattress value in the EU. The share of Chinese imports in total imports is higher in EU Member States than it is in Wider Europe (25-30%).

Chart 6: IMPORTS AND EXPORTS TO AND FROM THE EU, ALL MATTRESSES (940421 AND 940429), IN VALUE

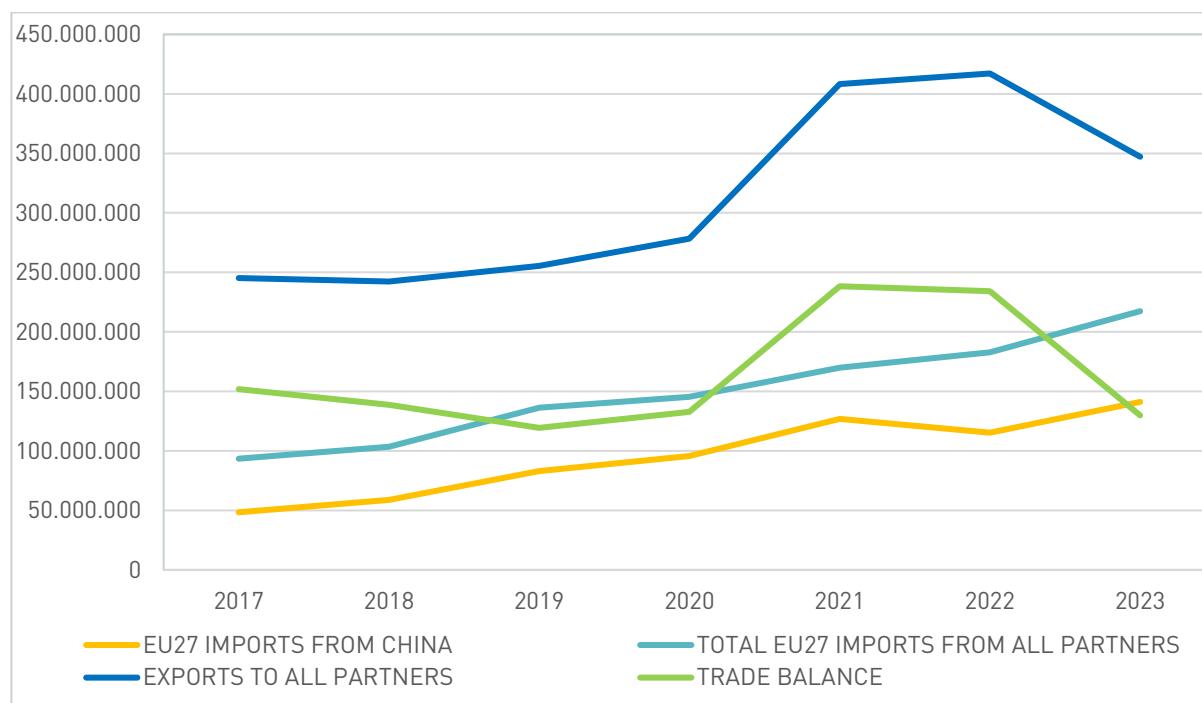


Source: EUROSTAT

The EU's trade surplus in the mattress sector has halved from 2022 to 2023, largely due to the significant drop in exports and the surge in imports FY2023. In terms of quantity, mattress exports have dropped from 105 Kt in 2022 to 82 Kt in 2023, while import quantities have increased from 91 Kt to 109 Kt. This shift has led to a trade deficit for the first time, with Chinese imports again driving the increase, accounting for 52% of the total import quantity.

Focusing on cellular rubber and plastics mattresses (HS code 949421), the data reveals a decline in exports from 417 million EUR to 347 million EUR, attributed to reduced demand from South Korea, the US, the UK, and Norway. Despite the decline, the EU still maintains overall a trade surplus thanks to the trade balance in this mattress category, although the surplus has narrowed. Imports in this segment have doubled over the last six years, with significant contributions from China, Serbia, Turkey, South Korea and Kosovo. Notably, Chinese imports alone accounted for a 26 million EUR increase in 2023, comprising 65% of total imports in this category, indicating an even higher exposure compared to either the wider European market or all mattresses' types category.

Chart 7: IMPORTS AND EXPORTS OF CELLULAR RUBBER AND PLASTIC MATTRESSES (HS 940421) TO AND FROM THE EU, IN VALUE, 2017 – 2023.



Source: EUROSTAT

Cellular rubber and plastics mattress (HS940421) exports in quantity decreased by 11 Kt between 2022 and 2023, returning to 2020 levels. Conversely, imports have tripled over the past seven years, with a 10 Kt increase in the last year alone. For the first time in recent history, imports surpassed exports in quantity, resulting in a negative trade balance. Chinese imports dominate this segment, accounting for 73% of the total imported quantity, highlighting a significant exposure to Chinese products.

Following on from the EUROPUR report “Analysis of Import & Export Statistics for Mattresses and Upholstered Furniture in wider Europe - December 2022”, tables below show the imports within the EU and the UK, which was not included in the analysis above, as well as the imports from non-EU countries.

Table 9: TRADE STATISTICS –VALUE (eur) AND QUANTITY (kg) OF MATTRESS IMPORTS TO ALL EU COUNTRIES (+UK) FROM EU COUNTRIES, 2022 VS 2023 (940421 HS Code)

| EU Country (+UK) | 2022 Import Value (€) | 2023 Import Value (€) | 2022 Import Qty (kg*) | 2023 Import Qty (kg*) |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Belgium | 57,152,663 | 52,319,615 | 7,976,475 | 7,373,163 |
| France | 27,527,440 | 10,566,105 | 5,659,495 | 1,933,876 |
| Germany | 121,824,704 | 91,289,415 | 14,489,250 | 9,606,921 |
| Italy | 39,589,027 | 40,567,784 | 5,785,494 | 5,468,288 |
| Netherlands | 52,917,664 | 57,789,026 | 7,652,979 | 8,238,405 |
| Poland | 320,406,730 | 286,829,860 | 53,753,615 | 47,817,108 |
| Portugal | 36,155,235 | 32,724,173 | 6,553,634 | 5,707,361 |
| Romania | 101,752,866 | 87,956,987 | 18,663,281 | 15,333,500 |
| Slovakia | 11,365,361 | 10,863,180 | 1,330,834 | 1,131,541 |
| Slovenia | 4,663,800 | 4,324,055 | 600,443 | 511,514 |
| Spain | 15,988,260 | 16,969,803 | 2,231,687 | 2,395,706 |
| Sweden | 22,390,301 | 18,556,737 | 2,917,395 | 2,606,673 |
| United Kingdom | 6,015,023 | 7,237,682 | 370,146 | 493,115 |
| Others | 135,613,969 | 137,853,558 | 13,418,573 | 15,493,939 |
| Total EU+UK (EU28) | 953,363,043 | 855,847,980 | 141,403,301 | 124,111,110 |

Source: EUROSTAT

Table 9 shows the imports to all EU countries (+UK) of products under HS code 940241, from the countries as reported by left column. In the analysis of mattress imports within European countries, a decline of approximately 14% in volume has been observed when comparing the years 2022 and 2023. Notably, France, Germany, Poland, and Romania each experienced a decrease in mattress exports during this period. This trend reflects a broader reduction in demand or other influencing market factors across key European markets.

Table 10: TRADE STATISTICS – MATTRESS IMPORTS TO THE EU/MS FROM NON-EU COUNTRIES, 2022 VS 2023 (940421 HS Code)

| Partners | Import Value to the EU/MS (EUR) | | % Change in value EUR | Import Qty to the EU/MS (Kg) | | % Change in kg |
|----------------|---------------------------------|-------------|-----------------------|------------------------------|------------|----------------|
| | 2022 | 2023 | 22 vs 23 | 2022 | 2023 | 22 vs 23 |
| China | 115,329,256 | 141,110,076 | 22,4% | 22,805,271 | 30,743,171 | 35% |
| Serbia | 14,902,022 | 24,282,730 | 62,9% | 2,798,362 | 4,176,964 | 49% |
| Türkiye | 23,952,332 | 17,844,477 | -25,5% | 3,563,255 | 3,490,459 | -2% |
| Switzerland | 9,969,281 | 10,372,906 | 4,0% | 494,814 | 449,242 | -9% |
| United Kingdom | 6,031,813 | 7,237,682 | 20,0% | 370,146 | 493,115 | 33% |
| Kosovo | 1,183,906 | 3,155,448 | 166,5% | 215,639 | 686,003 | 218% |

| | | | | | | |
|------------------------|-----------|-----------|----------------|---------|---------|--------------|
| United States | 2,672,090 | 2,999,996 | 12,3% | 204,374 | 208,553 | 2% |
| North Macedonia | 802,920 | 1,975,122 | 146,0% | 85,205 | 229,564 | 169% |
| South Korea | 29,945 | 1,448,545 | 4737,4% | 5,202 | 106,560 | 1948% |
| Sri Lanka | 942,409 | 1,133,738 | 20,3% | 152,695 | 239,553 | 57% |

Source: EUROSTAT

From the statistics above the rise in imports from China is evident, which is supplemented by significant imports also from Türkiye, Serbia and Kosovo.

Chinese mattresses seem to serve the low-end market of the mattress industry, compared to the higher-end European exports, as it can be seen below in the analysis on the average price per kilogram of imported and exported mattresses. Prices of mattresses imported from China have seen fluctuations, with a slight decrease until 2020, followed by an increase in 2021 and 2022. While the average price of imports declined by 20% in 2023, primarily due to cheaper spring mattress imports, the price of foam mattresses faced a 9% decrease, yet maintaining historical average levels. On the export side, European mattress prices have increased, driven largely, but not only, by the rise in foam mattress prices.

Table 11: AVERAGE PRICE OF KILO OF MATTRESSES, 2017 – 2023, in EUR

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|-----------------------------|------|------|------|------|------|------|------|
| CN Imports to the EU | | | | | | | |
| All mattresses | 4,31 | 4,26 | 4,32 | 4,02 | 4,40 | 4,91 | 4,03 |
| Cellular/Plastic | 4,71 | 4,59 | 4,73 | 4,43 | 4,73 | 5,06 | 4,59 |
| Other/Spring | 3,72 | 3,75 | 3,60 | 3,60 | 4,06 | 4,71 | 3,37 |
| EU Exports | | | | | | | |
| All mattresses | 6,29 | 6,42 | 6,24 | 6,17 | 6,06 | 7,15 | 7,60 |
| Cellular/Plastic | 7,77 | 8,41 | 7,96 | 8,05 | 7,77 | 9,09 | 9,96 |
| Other/Spring | 5,25 | 5,21 | 5,18 | 5,01 | 4,84 | 5,66 | 5,86 |

Source: EUROSTAT, EUROPUR calculations

The European mattress market is experiencing a shift towards increased imports, particularly from China, resulting in a reduced trade surplus and even a trade deficit in certain segments, posing risks on market saturation with low-cost Chinese products. The low prices of those imports, in a global volatile and price fluctuated environment, could undercut European manufacturers and erode their market share in specific market segments. European manufacturers may be seen to innovate and focus on higher-end products to maintain their competitive edge and mitigate these risks, as some already focus on.

2.3. The Automotive Industry

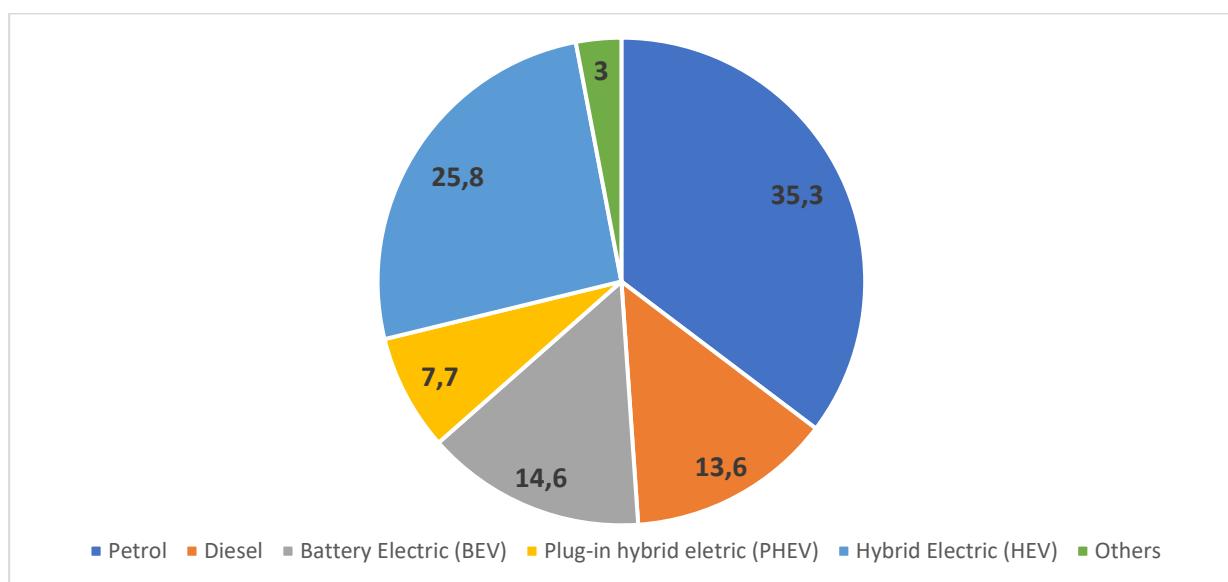
In 2023, the European automotive market experienced a significant rebound, growing by nearly 14% and surpassing 17 million units of light vehicles, as supply chain issues eased. However, this growth does not represent a full return to pre-pandemic conditions. By the end of 2023, LMC Automotive reported that global light vehicle production rose from 82.5 million units in 2022 to 90.8 million units, reflecting a 10% increase.

Data from LMC Automotive revealed notable production increases in major markets for 2023. In China, production rose from 26.1 million units in 2022 to nearly 29 million units in 2023, marking an 11.1% increase. The United States saw production increase from 9.7 million units in 2022 to 10.2 million units in 2023, reflecting a 5.1% growth. In Japan, production grew from 7.4 million units in 2022 to 8.5 million units in 2023, an increase of 14.8%. LMC Automotive reports that production of light vehicles increased across all major producing countries in 2023 compared to 2022. However, Japan is expected to reach 2019 production levels only by the early 2030s.

While production volumes have increased and supply chains for all components have eased, ensuring a smooth supply chain continues to be a challenge for the industry.

According to data published by ACEA, sales in Europe grew by 18% in 2023 compared to 2022, with increases observed in both EU and Eastern European markets. Russia and Ukraine, which saw substantial declines in 2022, experienced significant recoveries in 2023, with growth rates of 63.5% and 58.9%, respectively. Türkiye also saw notable growth, producing 1.41 million units in 2023, up from 1.29 million in 2022, representing a 9.3% increase.

Chart 8: NEW EU CAR REGISTRATIONS BY POWER SOURCE, IN %



Source: ACEA (European Automotive Manufacturers Association)

The chart above illustrates the increase in battery-containing vehicles and the reduction in the share of diesel vehicles in 2023.

Table 12: AUTOMOTIVE SALES IN THE LEADING EU COUNTRIES, 2022 & 2023 (NO. OF VEHICLES)

| Market | 2023 | 2022 | % Change |
|---------------------|-------------------|-------------------|--------------|
| EU | 12,126,604 | 10,896,033 | 11.29 |
| EFTA | 427,512 | 387,634 | 10.29 |
| United Kingdom | 901,893 | 776,764 | 16.11 |
| Russia | 491,000 | 445,247 | 10.28 |
| Turkey | 960,230 | 806,971 | 18.99 |
| Others-Europe* | 508,516 | 390,230 | 23.26 |
| Total Europe | 14,988,671 | 13,315,633 | 12.56 |

*Includes Belarus, Kazakhstan, Serbia, Ukraine & Uzbekistan

Source: ACEA (European Automotive Manufacturers Association), used with kind permission

As reported by ACEA and LMC **Automotive**, sales of vehicles have increased substantially from 2022 to 2023, with Türkiye having the largest volume increase.

Table 13: PASSENGER VEHICLE PRODUCTION 2021-2023 AND FORECASTS TO 2027 ('000 VEHICLES)

| Country | 2022 | 2023 | % Change 2022/2023 | 2024F | 2025F | 2026F | 2027F |
|---------------------|---------------|---------------|-----------------------|---------------|---------------|---------------|---------------|
| Austria | 113 | 99 | -14.14 | 106 | 96 | 90 | 134 |
| BE & NED | 345 | 387 | 10.85 | 260 | 230 | 264 | 341 |
| France | 1,382 | 1,538 | 10.14 | 1,602 | 1,738 | 1,691 | 1,661 |
| Germany | 3,694 | 4,321 | 14.51 | 4,563 | 4,907 | 4,856 | 4,852 |
| Italy | 766 | 843 | 9.13 | 798 | 707 | 742 | 756 |
| Spain & Portugal | 2,500 | 2,740 | 8.76 | 2,844 | 2,792 | 2,865 | 2,987 |
| UK | 854 | 1,003 | 14.86 | 934 | 911 | 984 | 1,065 |
| Czech Republic | 1,216 | 1,377 | 11.69 | 1,263 | 1,330 | 1,338 | 1,327 |
| Hungary | 451 | 474 | 4.85 | 470 | 511 | 648 | 699 |
| Poland | 420 | 554 | 24.19 | 700 | 696 | 687 | 679 |
| Slovakia | 970 | 1,061 | 8.58 | 1,024 | 1,073 | 1,100 | 1,066 |
| Others Europe* | 387 | 366 | -5.74 | 396 | 582 | 636 | 594 |
| Total Europe | 13,098 | 14,763 | 11.28 | 14,960 | 15,573 | 15,901 | 16,161 |
| Russia | 533 | 681 | 21.73 | 844 | 851 | 851 | 889 |
| Turkiye | 1,294 | 1,414 | 8.49 | 1,269 | 1,423 | 1,487 | 1,564 |
| Grand Total | 14,925 | 16,858 | 11.47 | 17,073 | 17,847 | 18,239 | 18,614 |

*Others Europe includes Belarus, Bulgaria, Finland, Serbia, Slovenia, Sweden & Ukraine

Source: LMC Automotive, used with kind permission

The table above displays production volumes for major European car-producing countries, showing significant increases in most regions, with a few exceptions attributed to plant closures and production shifts. Overall, the EU automotive sector has demonstrated growth. However, it faces challenges from imports, which have surged by 37.1% from 2022 to 2023 as seen in the tables below.

Table 14: EU NEW CAR IMPORTS, MAIN COUNTRIES OF ORIGIN, trade in value (in million EUR)

| Trade in value (in million EUR) | 2022 | 2023 | % change 23/22 |
|---------------------------------|-------|--------|----------------|
| China | 9,349 | 12,812 | +37.1 |
| United Kingdom | 7,768 | 10,265 | +32.1 |
| Japan | 7,340 | 10,201 | +39.0 |
| South Korea | 7,919 | 9,923 | +25.3 |
| United States | 5,151 | 7,798 | +51.4 |

Source: EUROSTAT, March 2024

Table 15: EU NEW CAR IMPORTS, MAIN COUNTRIES OF ORIGIN, trade in volume (in units)

| Trade in volume (in units) | 2022 | 2023 | % change 23/22 |
|----------------------------|---------|---------|----------------|
| China | 484,750 | 676,848 | +39.6 |
| Türkiye | 446,120 | 514,854 | +15.4 |
| Japan | 339,051 | 447,964 | +39.0 |
| South Korea | 410,551 | 430,427 | +25.3 |
| Morocco | 328,831 | 382,558 | +51.4 |

Source: EUROSTAT, March 2024

3. FLEXIBLE PU SLABSTOCK FOAM PRODUCTION DATA

The data presented here has been aggregated in accordance with CEFIC guidelines for handling confidential statistics in compliance with competition law. This includes ensuring that at least three companies are represented per geographical area and that no single company accounts for more than 70% of the reported data in any given area. Whenever possible, data has been reported from regions with at least five companies, with no single company exceeding 70% of the reported data. All information provided by EUROPUR members is treated as confidential, and comments are reported anonymously. With significant growth in EUROPUR membership, the total polyether foam production by members now represents approximately 90% of all slabstock PU foam production across the 27 EU Member States, as well as the UK, Norway, Switzerland, Albania, Belarus, Bosnia and Herzegovina, Kazakhstan, Kosovo, Serbia, North Macedonia, Ukraine, Russia, and Türkiye. This extensive data from members provides a robust basis for accurately representing trends in foam production.

In compliance with CEFIC guidelines and antitrust regulations, polyether foam production is presented by region. Data for polyester foam production cannot be broken down by country due to the limited number of producers.

The production data presented here was collected from EUROPUR members through a questionnaire they completed. For non-members, data was gathered from foam producers via questionnaires, personal interviews, and telephone interviews. Additionally, data was sourced from a variety of secondary sources.

Table 16: DATA SUMMARY FOR 2023 (EU27, UK, NO, CH, RUS, TR & REST OF EUROPE)

| TOTAL PU FLEXIBLE FOAM PRODUCTION | | 1,594,126 tonnes |
|--|--|-------------------------|
| Total PU Slabstock Foam Production | | 1,370,315 tonnes |
| Total POLYETHER Slabstock Foam Production | | 1,321,552 tonnes |
| Total POLYESTER Slabstock Foam Production | | 48,763 tonnes |
| Total PU Moulded Foam Production | | 223,811 tonnes |
| Total Number of Continuous Foaming Plants | | 173 |
| Estimated Full Time Employees in PU Foam Production | | 24,380 FTE |
| Estimated PU Foam Industry Turnover: | | 5.1 billion EUR |

Source: EUROPUR, B&P

In 2023, a total of 1,321,552 tonnes of polyether foam was produced, reflecting a 1.8% increase compared to 2022. Polyester foam production totalled 48,763 tonnes, marking a decrease of 13.2% from the previous year. The growth in polyether slabstock foam was primarily driven by increases in Eurasia (including Russia, Ukraine, Belarus, Kazakhstan, and Uzbekistan) and Türkiye. Excluding Eurasia, compared to 2022, market receded 2.3%. When excluding both Eurasia and Türkiye, the total growth was -5% compared to 2022.

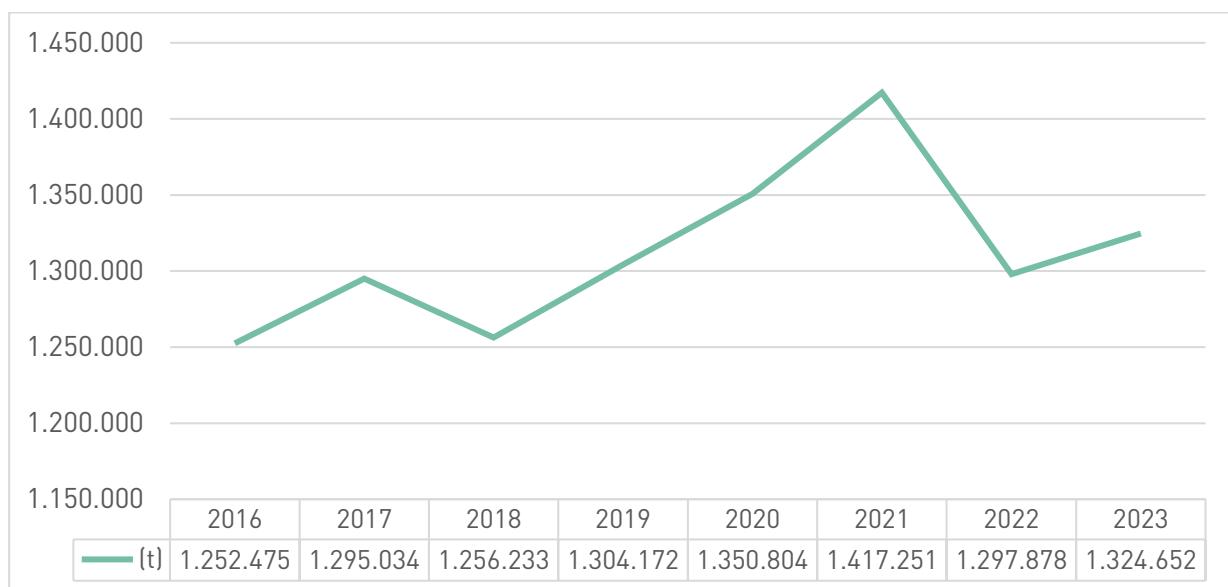
Overall, 2023 presented a mixed picture. While results were better than anticipated at the 2022 conference in Budapest, demand remained “sluggish”, and the market showed significant variability in demand.

In 2023, supply chains began to ease from the most challenging periods but continued to face difficulties. The year was marked by volatility in chemical raw material prices and logistical challenges. A significant issue in the latter half of 2023 was the sluggish demand for end products, a trend that has extended into 2024 and still persists. This situation is largely driven by geopolitical challenges and a lack of demand, which has exerted pressure on foam margins. "Cost" remains the predominant issue facing the flexible foam industry.

Based on interviews and feedback from third parties, the focus on cost reduction amid lower demand has occasionally led to compromises in product quality, with a tendency towards using lower-density foams. These significant cost increases are compounded by expenses related to maintaining and investing in End-of-Life (EoL) solutions, sustainability initiatives, and circular economy activities.

Despite the current uncertain outlook, the industry has experienced substantial growth over the past eight years, as illustrated in the chart below:

Chart 9: POLYETHER SLABSTOCK PRODUCTION EUROPE (in tonnes), 2016-2023



Source: EUROPUR, B&P

The chart provided illustrates that, despite the prevailing uncertainty, production levels in 2023 were comparable to those in 2019.

3.1. Foam Production by Region

The below chart of PU slabstock (polyether and polyester) production, whilst a standard in this report over many years, is becoming less relevant and the numbers should only be used as a rough guide.

The country groups can be divided into 5 subcategories:

- **Eurasia** – containing either difficult or closed markets
- **Türkiye** – seems to always be growing above the average
- **Eastern & South Eastern Europe** – flat to single digit negative
- **France, Benelux, Germany, Scandinavia, Italy & Iberia** – single digit negative
- **UK and Ireland** – single digit positive

Large companies who have plants in multiple countries have also shifted production to maximise unit costs of production which has also played a small role in the country statistics.

Table 17: PU SLABSTOCK (POLYETHER + POLYESTER) PRODUCTION EUROPE (T), BY REGION, 2019-2023

| Region | 2019 | 2020 | 2021 | 2022 | 2023 | % AAGR (2022/2023) |
|--|------------------|------------------|------------------|------------------|------------------|-----------------------|
| Germany, Austria and Switzerland | 129,987 | 133,748 | 141,921 | 119,006 | 108,410 | -8.9% |
| Benelux | 88,392 | 88,498 | 82,041 | 72,863 | 62,539 | -14.2% |
| UK and Ireland | 78,488 | 74,041 | 75,298 | 66,614 | 68,549 | 2.9% |
| Scandinavia & Baltics | 77,345 | 78,981 | 82,181 | 76,777 | 64,793 | -15.6% |
| Poland | 223,185 | 217,739 | 228,037 | 204,019 | 206,042 | 1.0% |
| Iberia | 109,716 | 126,499 | 138,818 | 129,511 | 125,162 | -3.4% |
| France | 32,734 | 30,765 | 31,192 | 27,994 | 25,319 | -9.6% |
| Italy and Malta | 105,916 | 105,900 | 116,696 | 113,668 | 105,916 | -6.8% |
| Balkans, Greece, and Cyprus | 42,396 | 47,625 | 44,383 | 40,576 | 40,492 | -0.2% |
| Romania and Bulgaria | 62,728 | 72,679 | 83,492 | 70,186 | 66,646 | -5.0% |
| Hungary, Croatia, Czechia, and Slovenia | 52,192 | 54,032 | 54,847 | 44,713 | 43,648 | -2.4% |
| EEA + UK | 1,003,079 | 1,030,506 | 1,078,906 | 965,929 | 917,515 | -5.0% |
| Eurasia* | 138,940 | 140,813 | 156,281 | 133,922 | 189,364 | 41.4% |
| Türkiye | 162,153 | 179,485 | 182,064 | 198,027 | 214,673 | 8.4% |
| Grand Total | 1,304,172 | 1,350,804 | 1,417,251 | 1,297,878 | 1,321,552 | 1.8% |

*Includes: Belarus, Kazakhstan, Russia, Ukraine, Uzbekistan. Note: Data accuracy has increased over the years. Any discrepancy with reports of previous years is due to improvement in knowledge of these years.

Source: EUROPUR, B&P



Austria, Germany & Switzerland (DACH) – total foam production in the region fell again by 8.9% after a large 16.31% fall in 2022.

The region continues to see significant volumes of mattress imports from its Eastern European neighbours and increasingly from China. The production of high-quality furniture establishes the region as a leading global exporter. In the lower-priced segment of the market, full foam mattresses remain dominant, although hybrid mattresses have gained market share as producers work to meet OEM price points.



Benelux region – the market experienced again pressure from competitively priced foams and products imported from Eastern Europe and China. Total foam production declined by 14.2% in 2023, following a 10.44% decrease in 2022. This sharp decline stabilized towards the end of 2023 and has continued at a low level into 2024. According to data from the Belgian furniture trade association, Fedustria, production fell by 13.2% in 2023 compared to 2022.



UK & Ireland – One of the brighter spots in 2023 was an increase in foam production by 3%. Automotive production saw a notable rise of just under 15% as product and supply shortages began to ease. The "Bed in a Box" market remains highly competitive and continues to be a significant consumer of foam. Recent consolidation in the market includes Eve Sleep, which was purchased from administration by Benson for Beds, and Simba, both of which are key suppliers in the UK. The UK remains the largest market in Europe for this product type, with Germany closely following.

Additionally, Strandfoam opened a new plant in Swindon, Wiltshire, in April 2023.



Scandinavia, Lithuania and Estonia – In 2023, a 15.6% decrease in production volumes was reported, with the most significant declines occurring in the Baltic countries. Production in Denmark, which is heavily focused on mattress exports, remained relatively stable, as global demand for high-end mattresses showed resilience. Historically, the ratio between spring, foam, and latex mattresses has remained fairly constant, with polyurethane continuing to hold a dominant position.



Poland – while Poland lost its No 1 position as the largest foaming country, it demonstrated some resilience in 2023 with a 1% increase in production volumes. However, this trend was not uniform across the industry. Some producers reported lower production volumes compared to 2022, while others remained stable. This discrepancy was largely influenced by the end markets served by the foam producers' customers. Foam producers exporting to countries such as Russia and Belarus experienced declines due to ongoing sanctions affecting these trades.



Iberia – the region experienced a 3.4% decline in production. Exports to the United States and Mexico, as well as to neighbouring European countries, stagnated due to the impact of additional trade tariffs imposed by the USA. There were also reports of end customers opting for lower-density foam to mitigate the rising costs of full foam mattresses, contributing to the increased popularity of hybrid and spring mattresses. The National Association of Furniture Manufacturers and Exporters (ANIEME) reported stagnation in furniture exports for 2023.

LMC reported an 8% increase in production within the Spanish automotive industry compared to 2022, as supply chain issues and demand improved.



France – foam production in the region declined by 9.6% in 2023, following a 10.19% drop in 2022 when compared to 2021. All major foam producers faced challenging conditions, driven by highly competitive markets and a lack of demand. Although raw material supplies improved, rising costs remained a significant challenge. Additionally, the region saw an increase in low-cost furniture and mattress imports from China, contributing further to market pressures. On a positive note, e-commerce sales channels continued to expand in 2023.

Meanwhile, LMC reported that the French automotive industry experienced a 10% increase in production compared to 2022, indicating a recovery in this sector.



Italy & Malta – the market experienced a 6.8% decrease in 2023. Despite the downturn, manufacturers of high-end furniture reported "reasonable sales," particularly in export markets like China and the United States, where the "Made in Italy" brand continues to be a strong selling point. The trend towards full foam mattresses, which had gained momentum since 2020, has slowed, with an increase in

the production and sales of spring and hybrid mattresses. In the lower-priced segment of the mattress market, foams with a density of 25kg/m³ are commonly used.

In the automotive sector, LMC reported that the Italian automotive industry saw a 9.13% increase in production in 2023 compared to 2022, reflecting a positive recovery in this area.



Greece, Balkans and Cyprus – in 2023, foam production in the Greece, Balkans, and Cyprus region remained relatively stable, with only a slight decrease of 0.2%. Toll manufacturing of foam for other producers continued, albeit at a reduced level compared to 2022, primarily due to supply chain disruptions in other regions. However, the region faced significant challenges, particularly due to the imposition of anti-dumping tariffs by the United States, which forced some producers to redistribute their production to other locations.

The rising cost of production was identified as a major challenge in the region, even as supply chain issues from previous years began to ease. This cost pressure led to an increased demand for low-density foams, particularly in the mattress industry. The growth of hybrid and spring mattresses, along with the rising imports of finished goods from China, further complicated the market landscape, posing additional concerns for local producers.



Romania & Bulgaria – foam production in the region experienced a 5.0% decline, largely driven by reduced demand in export markets and the collapse of exports to Russia and Belarus, along with a significant decrease in exports to Ukraine. The Romanian Furniture Manufacturers Association (APMR) highlighted that the majority of domestic furniture production is export-oriented, with approximately 70% of output sold abroad. Additionally, exports of mattresses from Bulgaria to the United States also declined during the year, reflecting broader challenges in international trade for the region.



Foamers in **Hungary, the Slovak and Czech Republics, Croatia and Slovenia** reported a 2.4% decrease in total production in 2023. Despite this decline, Hungary continued to export over 50% of the mattresses and upholstery it manufactured. Hungarian foamers also benefited from toll manufacturing arrangements in neighbouring Balkan countries, where they operate conversion units, although this activity decreased compared to 2022. The region's foam industry was further impacted by the ongoing war in Ukraine, leading to a collapse in exports to Russia and Belarus, which contributed to the overall production decline.



Russia, Kazakhstan, Ukraine, Belarus and Uzbekistan (Eurasia) – experienced a significant 41.4% increase in foam production during 2023. The market has become increasingly self-contained due to the impact of the war in Ukraine, which has largely halted exports to Europe and disrupted the import of raw materials from Europe. To compensate, most of the region has turned to China for the supply of raw materials, especially TDI, with previous supply chain issues now largely resolved. Despite the ongoing war and sanctions on Russia, Kazakhstan's furniture manufacturing sector has continued to develop dynamically, though at a somewhat reduced pace.



Türkiye – demonstrated again strong growth in 2023 with an increase of 8.4%. This growth allowed Türkiye to surpass Poland as the largest "slabstock foam" producer.

The focus of the 2024 conference, held in Istanbul, was on Türkiye's achievements and challenges in the foam industry, which are summarised below (to the best of our knowledge):

Türkiye now operates 29 continuous foam production lines across 25 companies, producing a total of 214,673 tonnes of slabstock foam. Production ranges from 100 t to 25,000 t of slabstock per year.

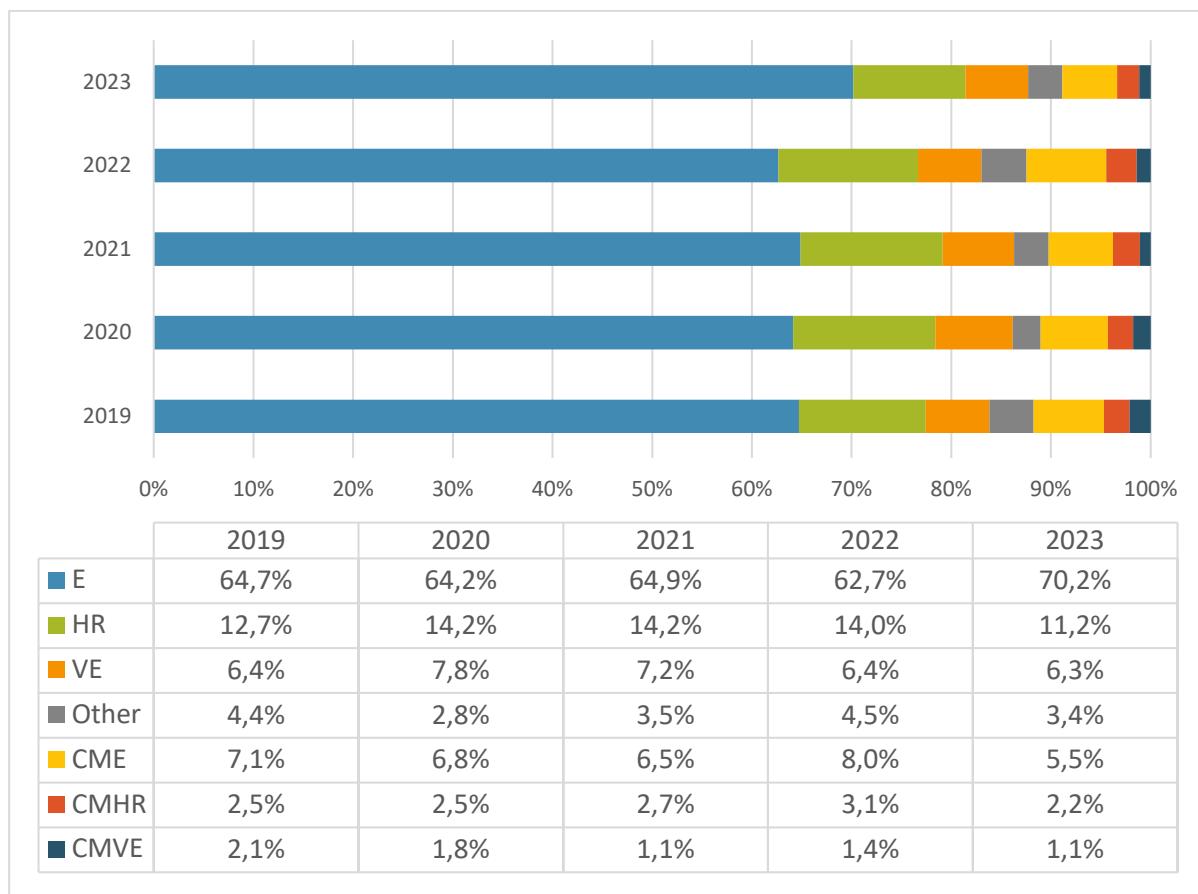
EUROPUR members are responsible for approximately 70% of the local production.

- The main end-use markets for flexible slabstock are upholstered furniture, mattresses, footwear, clothing and the automotive industry. There was also significant demand for trim foam for pillows, cushions, furniture, and toys, as well as high-density rebounded foams and lightweight packaging materials.
- Strong performance driven by high demand for comfort goods – e.g. earthquake support.
- Exports to the EU saw a slight increase, while exports to the Middle East and Northern Africa rose significantly. However, exports to the United States plummeted by over 90% due to anti-dumping tariffs.
- Türkiye enjoyed better availability of chemical raw materials for foam production compared to other countries, with TDI imports increasing by 7.1% in 2023 compared to 2022.
- Outlook for 2024 – Growth in 2024 is expected to be lower, primarily due to local economic challenges, including a credit squeeze, inflation, and logistical issues.

3.2. Foam Production by Type

The chart below delineates polyether slabstock production by type, specifically for EUROPUR members. It was noticeable that the 2023 percentage of standard foam increased from 62.7% in 2022 to 70.2% in 2023. Further analysis showed a pattern that clearly relates to the large growth in the markets of Türkiye and Eurasia where more standard form is produced when compared to other types coupled with the negative growth seen in the traditional European markets.

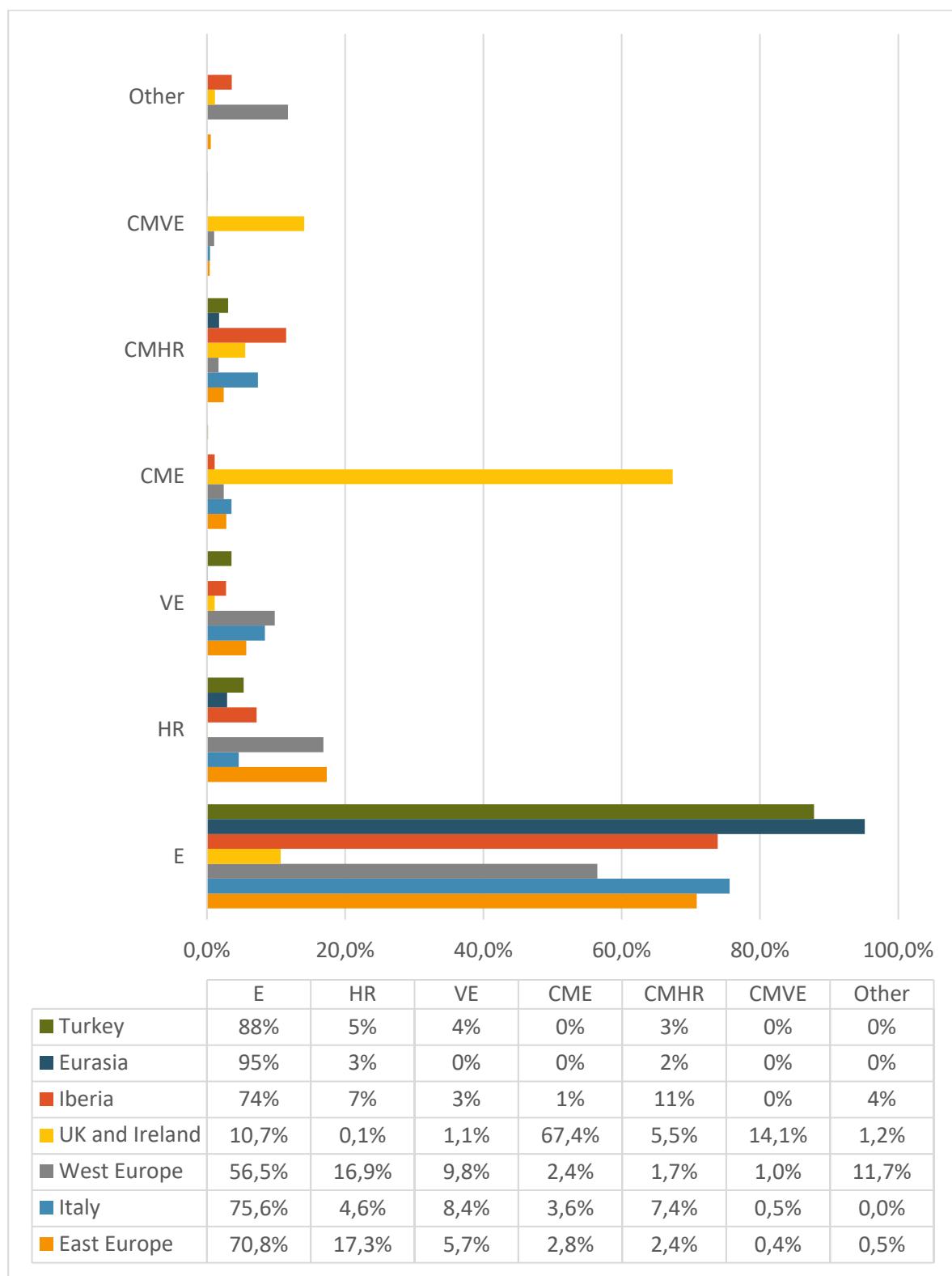
Chart 10: POLYETHER PRODUCTION BY TYPE (%), 2019-2023 (EUROPUR MEMBERS ONLY)



Source: EUROPUR

Chart 10 provides a comprehensive breakdown of foam types across European regions, underscoring the significance of the growth seen in both Türkiye and Eurasia. This highlights the pivotal role played by these regions within the broader European context.

Chart 11: POLYETHER PRODUCTION BY TYPE (%) AND REGION, 2019-2023 (EUROPUR MEMBERS ONLY)



Source: EUROPUR

3.3. Trade Data – Imports & Exports

2023 data from EUROSTAT showed a significant decrease in foam imports in value into the EU & UK compared to 2022. The noticeable changes were Russia due to the Ukraine war and Serbia due to US anti-dumping tariffs. China grew but as the expense of other Asian importing countries as it has not increased the total volume of imports above the current 7% market level. Türkiye is the noticeable country from where the EU was importing goods from and this is supported by the rapid growth shown in the Turkish market in 2023.

Table 18: ORIGIN OF IMPORTS OF FLEXIBLE FOAM INTO THE EU 28, 2019-2023 (tonnes, EUR million)

| Leading Importers | 2019 | 2020 | 2021 | 2022 | 2023 | % Change 2022/23 |
|----------------------------|--------------|--------------|--------------|--------------|--------------|------------------|
| United States | 2,141 | 1,432 | 1,871 | 1,673 | 1,663 | -0,6% |
| Russia | 1,443 | 2,109 | 8,126 | 1,531 | 0,124 | -91,9% |
| China | 3,281 | 1,955 | 1,851 | 2,008 | 2,423 | 20,7% |
| Switzerland | 0,8 | 0,926 | 1,261 | 1,572 | 1,613 | 2,6% |
| Turkey | 1,551 | 1,647 | 1,718 | 1,692 | 2,201 | 30,1% |
| Serbia | 2,97 | 6,1 | 11,356 | 6,162 | 3,647 | -40,8% |
| Others | 29,15 | 25,56 | 27,61 | 24,62 | 22,04 | -10,5% |
| Total (tonnes) | 41,34 | 39,73 | 53,79 | 39,26 | 33,71 | -14,1% |
| Total (EUR million) | 973 | 896 | 1191 | 1187 | 1046 | -11,9% |

Source: EU Market Access Database HS 39211310

Table 19: TOP 10 DESTINATIONS OF EXPORTS OF FLEXIBLE FOAM OF EU ORIGIN, 2019-2023 (EUR million)

| Country | 2019 | 2020 | 2021 | 2022 | 2023 | % Change 2022/2023 |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|--------------------|
| United States | 31,585 | 27,881 | 42,857 | 40,372 | 40,416 | 0,1% |
| Mexico | 10,926 | 10,504 | 17,523 | 19,515 | 38,409 | 96,8% |
| China | 24,337 | 24,088 | 27,117 | 28,257 | 34,346 | 21,5% |
| Türkiye | 13,913 | 14,568 | 16,802 | 23,961 | 26,548 | 10,8% |
| Serbia | 12,712 | 15,831 | 21,912 | 23,279 | 25,170 | 8,1% |
| Ukraine | 14,671 | 19,351 | 21,352 | 18,814 | 21,982 | 16,8% |
| Morocco | 10,537 | 9,05 | 10,47 | 14,227 | 17,797 | 25,1% |
| Switzerland | 15,589 | 14,613 | 21,094 | 19,74 | 17,648 | -10,6% |
| Tunisia | 4,494 | 3,868 | 5,884 | 6,848 | 7,918 | 15,6% |
| Bosnia & Herzegovina | 6,947 | 6,108 | 9,093 | 9,209 | 7,591 | -17,6% |
| Total non-EU | 224,493 | 221,971 | 299,327 | 280,645 | 310,044 | 10,5% |

Source: EU Market Access Database HS 39211310

The above chart shows the changes in export destinations from the EU, in million €, but it is noticeable that the changes are, in the main, driven by US import tariffs. The top 10 is sorted by the value in 2023. The chart below shows the same top 10 export destinations as before but in tonnage.

Table 20: Top 10 DESTINATIONS OF EXPORTS OF FLEXIBLE FOAM OF EU ORIGIN, 2019-2023 (tonnes)

| Country | 2019 | 2020 | 2021 | 2022 | 2023 | Change 2022/2023 |
|---------------------------------|---------------|---------------|---------------|---------------|---------------|------------------|
| United States | 5,428 | 4,520 | 8,257 | 6,204 | 5,676 | -8,5% |
| Mexico | 1,459 | 1,573 | 2,652 | 2,596 | 3,449 | 32,9% |
| China | 3,322 | 2,967 | 3,051 | 2,892 | 2,829 | -2,2% |
| Turkiye | 2,507 | 2,622 | 2,702 | 3,672 | 3,549 | -3,3% |
| Serbia | 3,888 | 4,483 | 4,938 | 4,866 | 5,177 | 6,4% |
| Ukraine | 4,442 | 5,528 | 4,718 | 3,944 | 4,705 | 19,3% |
| Morocco | 1,979 | 1,744 | 2,064 | 2,555 | 2,725 | 6,7% |
| Switzerland | 2,564 | 2,378 | 2,816 | 2,372 | 2,085 | -12,1% |
| Tunisia | 708 | 792 | 4,479 | 1,671 | 7,918 | 373,8% |
| Bosnia & Herzegovina | 1,92 | 1,762 | 2,273 | 2,123 | 1,780 | -16,2% |
| Total non-EU | 63,127 | 62,082 | 77,424 | 51,289 | 53,626 | 4,6% |

3.4. Changes in the Foam Industry & Recycling Update

The year 2023, again, brought both challenges and opportunities to the flexible Polyurethane Foam industry. The ongoing consolidation and restructuring in the slabstock foam sector continued, leading to significant shifts in the market landscape. Additionally, there was a growing trend towards the recycling of post-consumer mattresses, with various chemical recycling projects taking shape in Europe. Furthermore, the influence of the Chinese market on the global foam industry became more apparent, impacting pricing, supply, and demand dynamics. The following section aims to provide an overview of the latest developments in the industry, highlighting key restructuring initiatives, advancements in recycling technologies, and the influence of the Chinese market.

I. Changes in the Flexible Foam Supply Chain (non-exhaustive list):

- At the end of 2022, Retour Matras invested into The Furniture Group, expanding the company's mattress recycling operations to the UK. Early 2024, the company also announced that it would open its first French operation in the South of France in the autumn of 2024.
- In January 2023, the former Oriolik foam plant – now owned by Plama PUR from Slovenia – restarted foaming operations under the name PLAMA – ORIOLIK d.o.o., after a complete modernisation.
- In February 2023, BASF announced its intention to close its Ludwigshafen TDI plant, notably due to high energy prices in Europe. The company remains a major supplier of TDI to Europe, from its US, South Korean and Chinese locations.

- In June 2023, Carpenter completed the acquisition of Recticel Engineered Foams in June 2023, making it one of the largest polyurethane foam solutions providers in Europe. With this acquisition, Carpenter now operates 28 foaming plants and 51 foam conversion sites globally.
- The former Recticel Engineered Foam plant in Alfreton (UK) was sold to GIL Investments, a UK-headquartered private investment fund, and is now operating as Alfreccell. The company became a EUROPUR member in June 2024 and its production is CertiPUR-certified since August 2024.
- In June 2023, the Abu Dhabi Group “ADNOC” made an initial offer for the acquisition of Covestro, which was revised in June 2024.
- In the summer of 2023, Triple Helix launched the construction of its polyurethane foam recycling plant on the site of an old Opel factory in the Port of Antwerp (Belgium).
- In September 2023, two large mattress manufacturers from Spain (Flex and Pikolin) created Eco-Colchon, an extended responsibility scheme (EPR) for the collection, dismantling and recycling of mattresses in Spain. Spanish legislation requires that an EPR scheme for mattresses be operational for April 2025. Other producers are progressively joining the Eco-Colchon initiative as means to collectively comply with their EPR obligations in Spain.
- In the autumn of 2023, Repsol inaugurated its repolyol production plant in Puertollano in Spain, the first industrial scale plant for the production of repolyol in the country.
- Also in the autumn of 2023, Retour Matras started the commercial operation of its repolyol plant in Lelystad (The Netherlands).
- In March 2024, foam and mattress producer Breckle in Nordheim (Germany) filed for insolvency.
- In May 2024, Eco-Maison – the French EPR scheme for mattresses and furniture – Covestro, Federal Eco-Foam and Secondly launched the Foam Recycling Ecosystem Evolution (FREE) project. The consortium formed with seek to enhance the quality of polyurethane recyclates. For chemical recycling in particular, the ambition is to recover both high quality polyols and TDI from post-consumer foams.
- In June 2024, the Ciech Group of companies changed its name to Qemetica.
- In July 2024, NEVEON and recycling management company BRANTNER green solutions have announced the setting up of a Joint venture to fill the gap in mattress recycling in Austria. The aim is to collect used mattresses in collaboration with collection points

and recyclables collection centres, disassemble them and then recycle them mechanically.

II. Embracing Sustainability, Circularity, and Localized Sourcing

The contemporary landscape of the mattress industry underscores the growing significance of sustainability and circularity imperatives. There is a discernible shift in the sourcing of raw materials towards environmentally sustainable alternatives. Collaborative endeavours within the value chain are being established to promote a higher degree of sustainability and circularity within the realm of mattress production. The management of end-of-life mattresses has become an increasingly salient aspect, necessitating the establishment of economically viable mattress collection systems. The gradual traction of Extended Producer Responsibility (EPR) frameworks is underway, although an expedited pace is desirable. Noteworthy leadership in this sphere is exemplified by European entities such as Eco-Maison (formerly known as Eco-Mobilier) in France and Valumat in Belgium. Additionally, The Netherlands has introduced an EPR scheme specifically for mattresses (Matras Recycling Nederland – MRN).

Outside of the European context, a prominent success story is the "Bye Bye Mattress" initiative led by the International Sleep Products Association (ISPA). Currently operational in several US states including California, Rhode Island, Connecticut and Oregon as of January 2025, this program serves as a notable achievement. The Mattress Recycling Council (MRC), affiliated with ISPA, claims a significant accomplishment of recycling approximately 13 million mattresses thus far.

Among the prevailing challenges encountered by mattress manufacturers, notable cost escalations in raw materials, labour, and logistics, alongside disruptions in the supply chain, have emerged. These factors have prompted manufacturers to engage in a process of strategic re-evaluation, often necessitating a shift towards more localised sourcing strategies, commonly referred to as "near sourcing".

III. The Influence of the Chinese Market

From the evidence presented it is now clear that one market has an influence on aspects of our markets both in raw material and finished goods.

a. Increasing dominance of China in the mattress market

As highlighted in the "Mattress and Upholstery Import/Export" report from December 2022, 7% of the mattress market within the EUROPUR region is comprised of imports, with approximately 80% of these imports originating from China, displacing other Asian suppliers. This distribution remains consistent in 2023. Although the overall import total has seen a slight increase, it is anticipated to rise more significantly in 2024. Meanwhile, some suppliers are leveraging the current cost advantages of lower energy and raw material prices, which is reflected in the reduced cost of raw materials.

China's position as the leading market and producer of isocyanates and polyether polyols significantly impacts the global foam industry. This dominance raises important questions about its influence on pricing, supply dynamics, and the overall market structure. Additionally,

projections concerning China's economic growth suggest potential implications for future demand for these base chemicals.

b. China's Role as the Largest Market and Producer

China's status as the leading market and producer of isocyanates and polyether polyol has substantial implications for the global foam industry. Developments in China's raw material market can significantly influence pricing and supply dynamics worldwide. In 2023, an oversupply in China led to shifts in production strategies among suppliers. Some opted to idle their plants, while others ramped up exports to other regions. Europe felt the impact as suppliers took advantage of the high energy costs there by increasing exports from China, although this effect has yet to be fully reflected in import and export statistics.

c. Projected Economic Growth in China

According to Reuters, China's Gross Domestic Product (GDP) grew by 5.2% in 2023, with similar growth of 5.2% in the first quarter of 2024 and 4.7% in the second quarter. The GDP growth for 2024 is projected to be around 5%. This economic expansion is anticipated to boost demand for base chemicals within China. However, inflationary pressures are prompting some upstream manufacturers to explore lower-cost alternatives, such as Vietnam and Indonesia, to mitigate rising costs.

China's impact on the flexible polyurethane foam industry is substantial. As the largest market and producer of isocyanates and polyether polyol, developments in China have far-reaching effects on global pricing, supply dynamics, and overall market conditions. The substantial volume of mattress imports into the EUROPUR region highlights China's crucial role in the industry. With China's economic growth expected to drive increased demand for base chemicals, the global foam market will likely experience further shifts. However, inflationary pressures are prompting some manufacturers to relocate production to lower-cost countries, which may lead to evolving supply chain dynamics in the coming years.

4. RAW MATERIAL SUPPLY AND DEMAND

The table below offers an estimated breakdown of raw material demand for the production of both moulded and slabstock foam. This data, sourced from EUROPUR members, categorizes polyether foams by type. A standard formula has been applied to these categories to estimate the overall raw material demand.

The estimation of raw material demand for automotive moulded foam is based on LMC automotive production data, with an average consumption of 14 kg of foam per vehicle. This includes various applications such as seat foam, headrests, armrests, and carpet underlay for noise, vibration, and harshness (NVH) reduction. It is assumed that the majority of this foam utilizes MDI technology.

Using production data categorized by foam type, along with standard formulations and the estimated share of TDI and MDI technologies, the following estimates for raw material demand have been derived. These figures pertain to foam production rather than poured foam. The average consumption per vehicle has been adjusted from 15 kg to 14 kg to account for the industry's shift towards lighter materials, particularly in the context of Electric Vehicles. Additionally, updates have been made to some formulations to reflect recent changes, including TDI shortages and efforts to reduce formulation costs.

Table 21: ESTIMATED RAW MATERIAL DEMAND, (EU28, NO, CH, RUS, EASTERN EUROPE & TR), 2023 (TONNES)

| Flexible Foam Type | MDI (t) | TDI (t) | Polyols (t) | Additives (t) | Total (t) |
|-----------------------------|----------------|----------------|------------------|---------------|------------------|
| Slabstock | | | | | |
| Conventional & CME | | 288.562 | 566.337 | 35.647 | 890.546 |
| HR & CM HR | 31.854 | 69.905 | 196.484 | 10.548 | 308.791 |
| VSE, CM VSE & Others | 24.015 | 7.404 | 84.013 | 7.383 | 122.815 |
| Polyester | 3.822 | 13.376 | 29.141 | 2.424 | 48.763 |
| Total Slabstock 2023 | 59.691 | 379.247 | 875.975 | 56.002 | 1.370.915 |
| Moulded | | | | | |
| Furniture & Bedding | 9.362 | 4.154 | 23.541 | 1.404 | 38.461 |
| Automotive | 54.252 | 9.654 | 113.385 | 8.059 | 185.350 |
| Total Moulded | 63.614 | 13.808 | 136.926 | 9.463 | 223.811 |
| Others *** | | | | | 36.254 |
| Total Flexible 2023 | 123.305 | 393.055 | 1.012.901 | 65.465 | 1.594.126 |

***Calculation inaccuracies in the model

Source: A. Austin, Belvedere and Partner & EUROPUR

The following section of the report examines the supply dynamics and pricing trends of TDI, MDI, and polyether polyols from 2015 through July 2024, based on data provided by Tecnon Orbichem.

In 2023, the extreme conditions that had persisted since 2019 began to stabilize. However, the situation did not fully return to pre-crisis norms. The market for the three primary raw materials — TDI, MDI, and polyether polyol — remains interconnected globally, meaning that changes in one region continue to impact others.

In 2023, Europe faced ongoing supply challenges, particularly with disruptions in the supply chain affecting imports from Asia. High energy costs continued to exert pressure on the market. Although demand remained weak throughout the year, leading to improved availability, efforts to increase prices were only partially successful.

In contrast, North America experienced a more stable supply situation during 2023, benefiting from stronger demand and smoother supply chains. However, disruptions in the supply of polyether polyols occurred due to local propylene shortages.

Asia, on the other hand, namely China, saw expansion in capacity for all 3 raw materials which featured technological advance in production processes and new facilities. Demand began to improve but is not yet back to pre-pandemic levels.

Isocyanate suppliers have been “throttling” European units and importing from plants mainly in Asia Pacific which weren’t running at full capacity and had significantly lower energy costs although this has decreased as 2023 progressed.

In 2023, there were approximately 3.20 million tonnes of TDI capacity, 11.13 million tonnes of MDI capacity, and just under 17 million tonnes of polyether polyol capacity. Investments in new facilities over the past few years, coupled with the effects of the pandemic, has led to isocyanate demand in 2023 to be in a position of some structural global oversupply.

4.1. TDI (Toluene Diisocyanate)

The TDI supply in Europe still showed continuing disruption during 2023 with most plants having lower production rates for most of the year. There was some disruption during the mid-year due to force majeures, although low demand and reduced imports enabled some balance within the market. During the third and fourth quarter supply and demand finally became more balanced. Overall, plant utilisation during 2023 was around 77.5% of capacity. Low demand and reduced imports “was the story” of 2023 which has continued into the first half of 2024.

Operating rates at most Chinese plants remained low with several small units remaining “off-line” for the whole of 2023 due to low profitability. The traditional upturn in production during the fourth quarter, beginning production for the Chinese New Year Holiday, saw sluggish growth. Exports also fell especially to Vietnam and Indonesia as demand fell again and the US anti-dumping tariffs began to take effect.

The general demand situation was in marginal oversupply during 2023, as local demand fell, and new capacities slowly came on stream. Disruptions in the supply chain and port capacity eased as demand in the export markets declined. Manufacturers remained cautious in export markets in case they were affected by the ongoing trade disputes between China and the United States in the mattress market (See “*Analysis of Import and Export Statistics for Mattress and Upholstered Furniture in wider Europe*”, December 2022). In addition, the strict government controls for the handling and storage of TDI continued to dampen demand.

In 2023 demand for TDI showed significant slowing down. Demand in North America stagnated and there are no expected capacity additions. New mattress tariffs should support more local growth also the reinstatement of a superfund tax as part of President Bidens infrastructure investment and Jobs act, the reinstated taxes will apply to a list of chemicals until the end of 2031. The tax will be imposed on both manufacturers and importers of a range of 42 chemicals including Toluene and Benzene. A second tax is being on imports of a wider range of chemicals which includes TDI.

TDI margins in Europe remained near the historic low in 2023 due to falling demand and a high-cost base although production outages in the mid-year have tightened the market, also imports from Asia have slowed as end user demand stagnated.

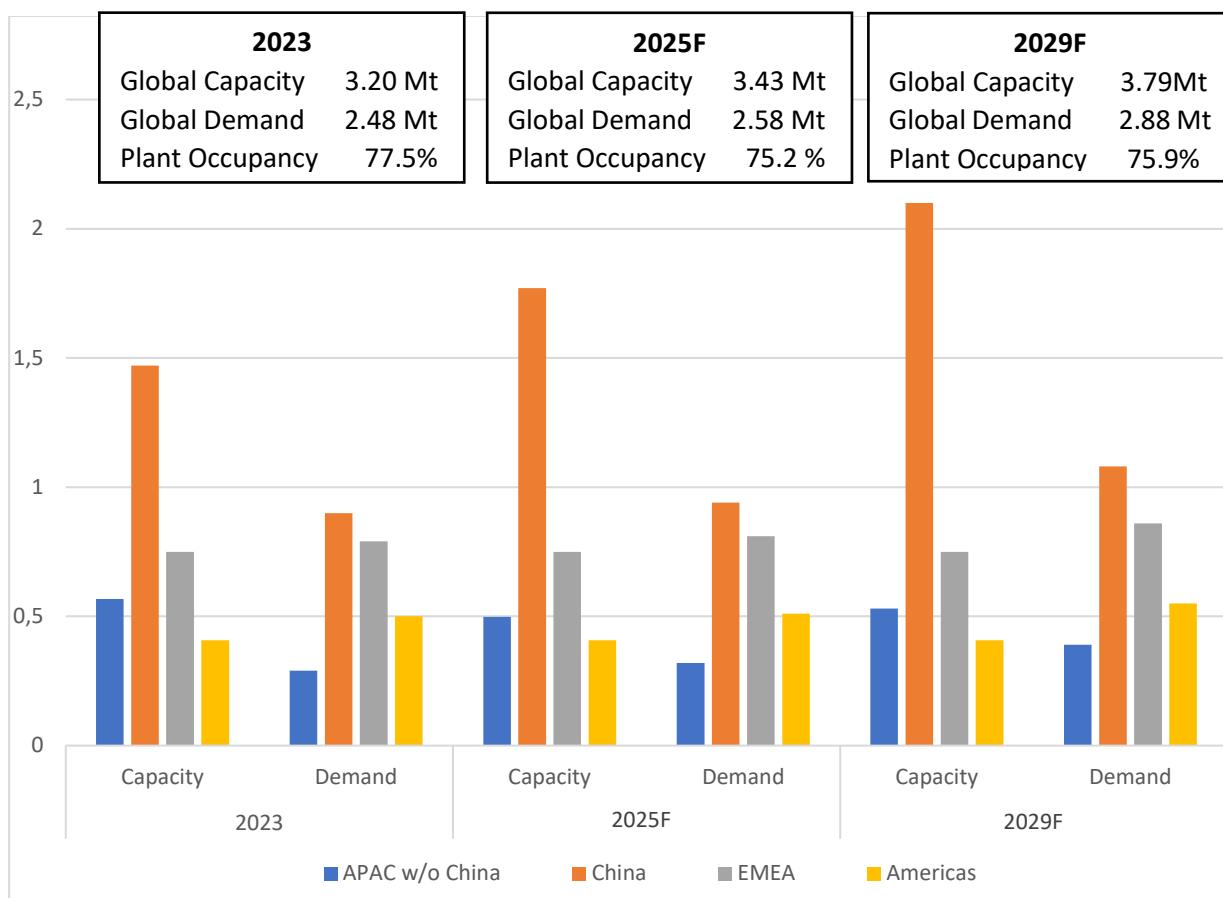
As the China plant data shows, a new plant is being planned 150KT from Fujian Southeast Electrochemical, with capacity expansions at Cangzhou Dahua and Heibei by circa 20KT each. They have also announced a new 225 kt TDI plant in 2023, although start up is expected to be delayed to 2024. China is now a net TDI exporter to North & South America and Africa as well as increasing market share in the rest of Asia. As the global slow down begins to affect TDI producers some Chinese suppliers e.g., Dahua have announced, in contradiction to previous expansion announcements, idling of their older units to maintain profitability and margins in the short term.

Another minor distortion in the global TDI market comes from the lowering of capacity in 2023 due to smaller plant closures being replaced by larger units e.g. Tosoh in Japan. and could also come from USA anti-dumping duty on imported TDI until September 2027. The closure of

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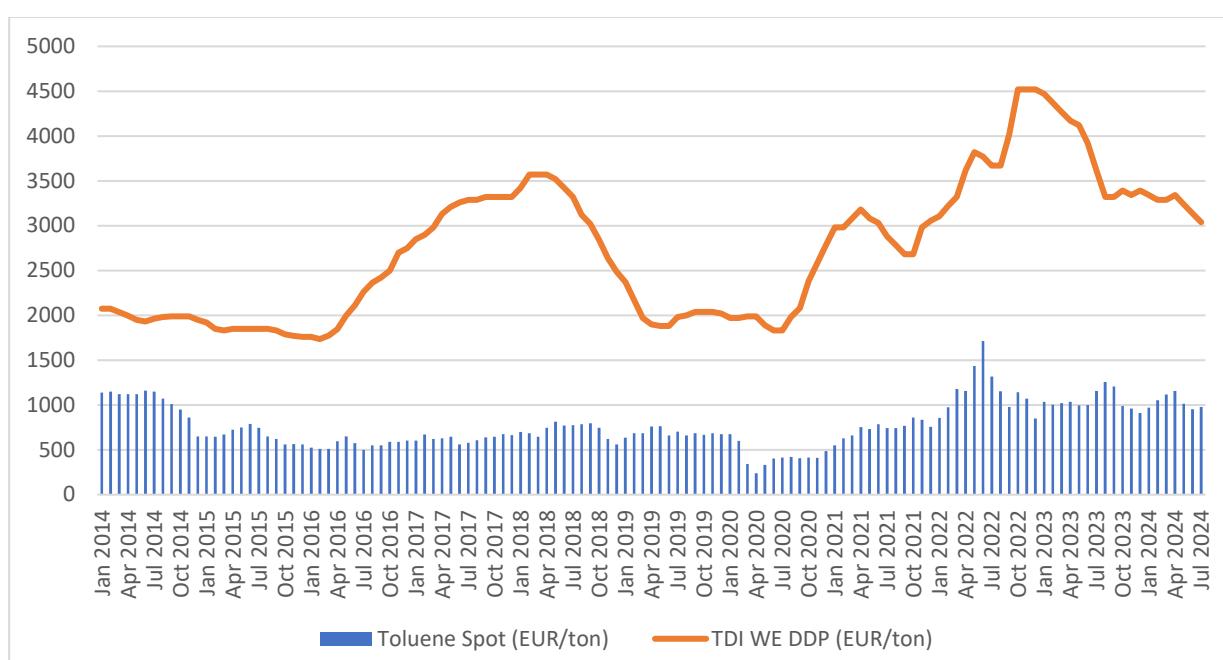
BASF's Ludwigshafen 300KT facility with supply being covered by other BASF plants in Asia and USA leave Europe vulnerable to supply chain disruptions.

Chart 12: CHANGES IN GLOBAL TDI NAMEPLATE CAPACITY & DEMAND 2023-2029 (MT)



Source: LRM, B&P Ltd, Company announcements

Chart 13: TOLUENE AND TDI PRICES IN EUROPE 2014 – July 2024



Source: Tecnon Orbichem, used with kind permission

The following table provides the nameplate capacities for TDI plants across the world, with announced new nameplate capacities through to 2029. The largest increase is expected in Asia, with stagnation and small debottlenecking projects in both Europe and USA adding small extra capacities.

Table 22: GLOBAL NAMEPLATE CAPACITIES FOR TDI PLANTS, 2023-2029 (F) (KTA)

| Crude TDI Nameplate Capacity | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|--------------------------------|------------|------------|------------|------------|------------|------------|------------|
| EMEA | Kta |
| BASF, Ludwigshafen (D) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covestro, Dormagen (D) | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Sadara, Jubail (KSA) | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Borsodchem, Karincbarika (HUN) | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Total EMEA | 750 |

| Asia Pacific | Kta |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| BASF, Shanghai (PRC) | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| Covestro, Shanghai (PRC) | 310 | 310 | 310 | 310 | 310 | 310 | 310 |
| Gansu Yingguang, Baiyin (PRC) | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Cangzhou Dahua, Cangzhou (PRC) | 120 | 120 | 120 | 150 | 150 | 150 | 450 |
| (Wanhua) Yantai Juli, (PRC) | 80 | 150 | 230 | 230 | 230 | 230 | 230 |
| Huludao Lianshi Chemical (PRC) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Wanhua, Yantai (PRC) | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Bluestar Taiyuan, Shanxi, PRC | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Wanhua Fujian | 100 | 250 | 250 | 250 | 250 | 250 | 250 |
| Xinjiang Juli Co. Ltd | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Lianshi Chemical | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Total China | 1470 | 1690 | 1770 | 1800 | 1800 | 1800 | 2100 |
| BASF, Yeosu (SK) | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| OCI Chemicals, Kunshan, (SK) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Hanwha, Yeochon (SK) | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Tosoh (NPU), Nanjang (J) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mitsui & SKC Polyurethanes Inc (J) | 120 | 120 | 50 | 50 | 50 | 50 | 50 |
| Gujurat Namarda (India) | 68 | 68 | 68 | 68 | 68 | 100 | 100 |
| Karoon Petrochemical, Mahshahr, (IRI) | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Total Asia w/o China | 568 | 568 | 498 | 498 | 498 | 530 | 530 |
| Total Asia & China | 2038 | 2258 | 2268 | 2298 | 2298 | 2330 | 2630 |

| Americas | Kta |
|---------------------|-----|-----|-----|-----|-----|-----|-----|
| BASF, Geismar (USA) | 160 | 160 | 160 | 160 | 160 | 160 | 160 |

| | | | | | | | |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Covestro, Baytown (USA) | 220 | 220 | 220 | 220 | 220 | 220 | 220 |
| RioTecero, Cordoba (ARG) | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| Total Americas | 408 |
| Global Total | 3196 | 3416 | 3426 | 3456 | 3456 | 3488 | 3788 |

Source: Nameplate capacities have been compiled and updated using only publicly available information from a variety of published sources including: Belvedere & Partner, Investor Reports, PU Magazine, pudaily.com, urethaneblog.com, Urethanes Technology International, ICIS.com, Market drivers for flexible polyurethane foam and consequences for its main feedstocks Perspective to 2030 – EUROPUR 2021

In summary, by the end of 2023, global TDI nameplate capacity was approximately 3.2 million tonnes, while global demand was around 2.5 million tonnes. New capacity planned for China is expected to increase the global total to around 3.8 million tonnes by 2029.

4.2. MDI (Methylene Diisocyanate)

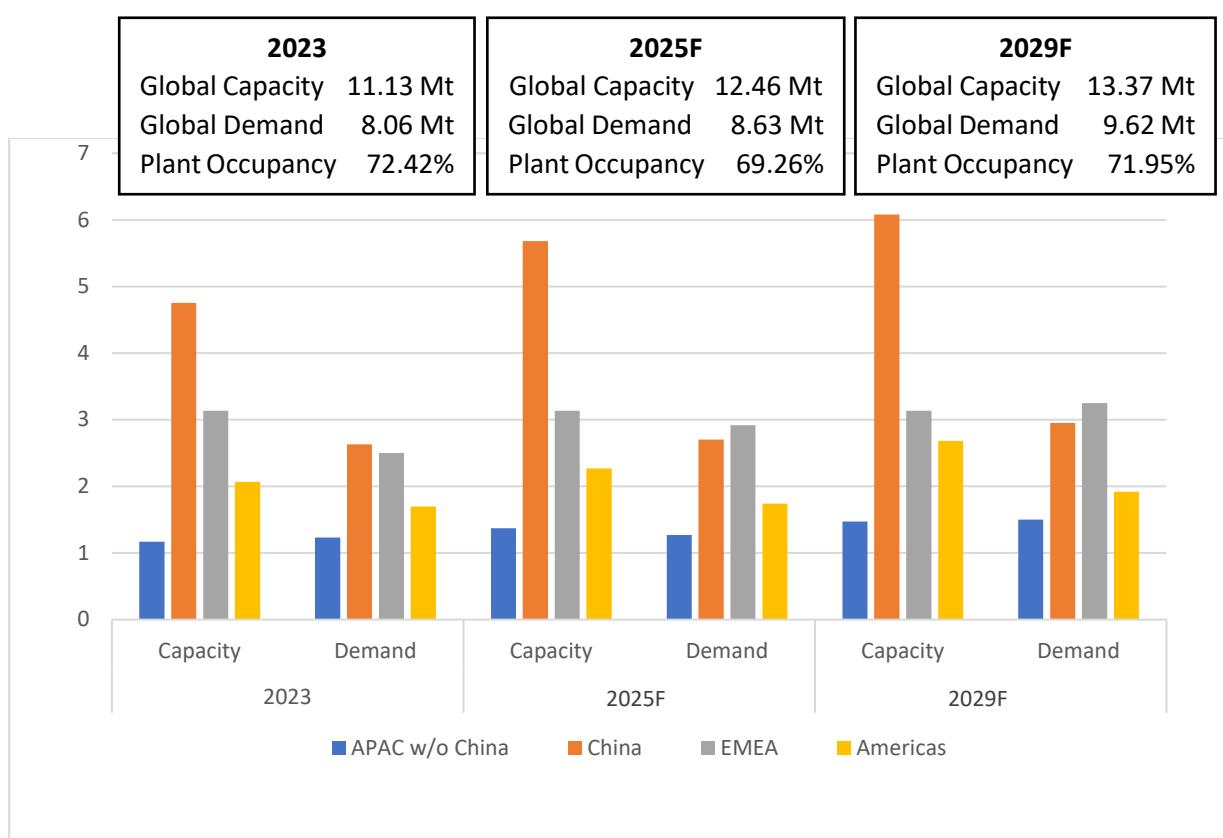
Globally, demand for MDI is projected to grow annually by 4-6%, reaching approximately 12.5 million tonnes per year by 2025. In Europe, demand is expected to increase at a rate of 2-3% per year, primarily driven by growth in the construction and insulation markets across all regions.

In the first half of 2023, Chinese demand, as the largest global market and producer, was weaker than anticipated due to lower-than-expected growth in various industries, particularly in the appliance sector. Supply constraints emerged mid-year due to plant maintenance at Wanhua, the country's largest producer, leading to an average operational level of approximately 70% for plants.

In 2023, the US market for polymeric MDI was generally balanced, though demand varied across different market segments. BASF is set to add a 300,000-tonne unit, and Wanhua has begun work on a 400,000-tonne plant, both located in the Gulf of Mexico. However, Covestro has postponed its planned investment. The lower-than-expected demand forecasts have resulted in delays in the announcement of new plant start-up dates.

European markets saw some demand improvement towards the end of 2023 but not high enough to allow market price increases. Demand continues to be weak into 2024.

Chart 14: CHANGES IN GLOBAL MDI NAMEPLATE CAPACITY & DEMAND 2023-2029F (MT)



Due to falling demand, MDI prices, in Europe, began to weaken from June 2022 and were still softening in July 2023 (Source: PIE).

Chart 15: BENZENE AND MDI PRICES IN EUROPE 2014 – July 2024

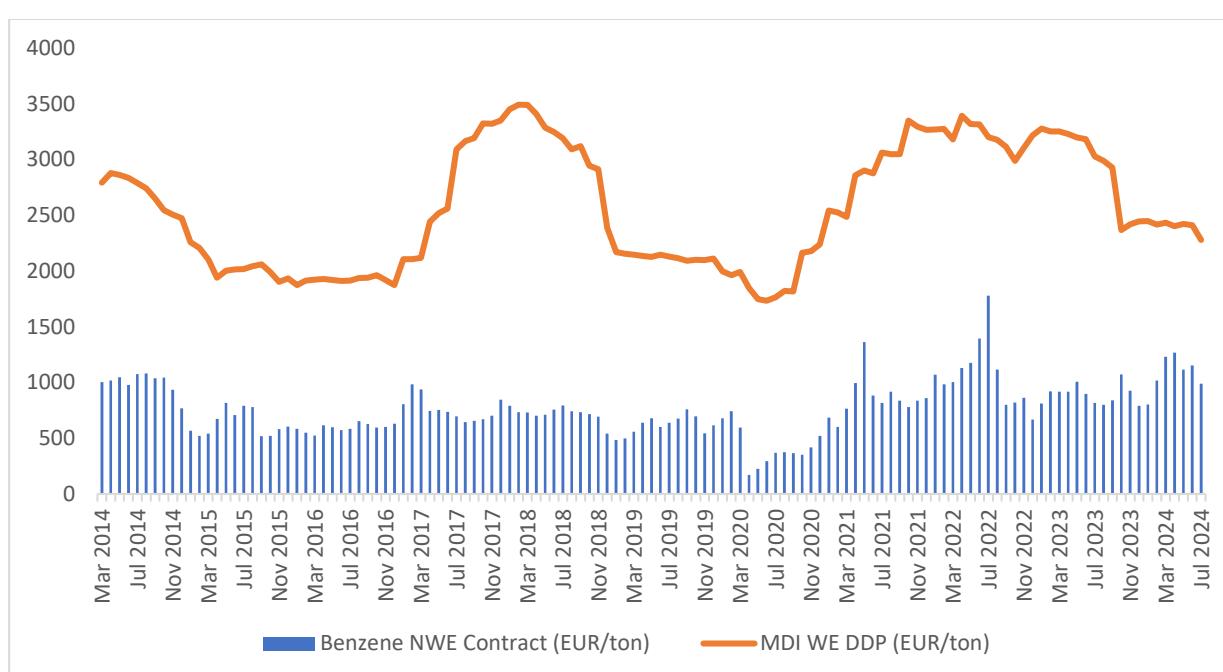


Table 23: GLOBAL NAMEPLACE CAPACITIES FOR MDI PLANTS, 2023-2029 (F) (KTA)

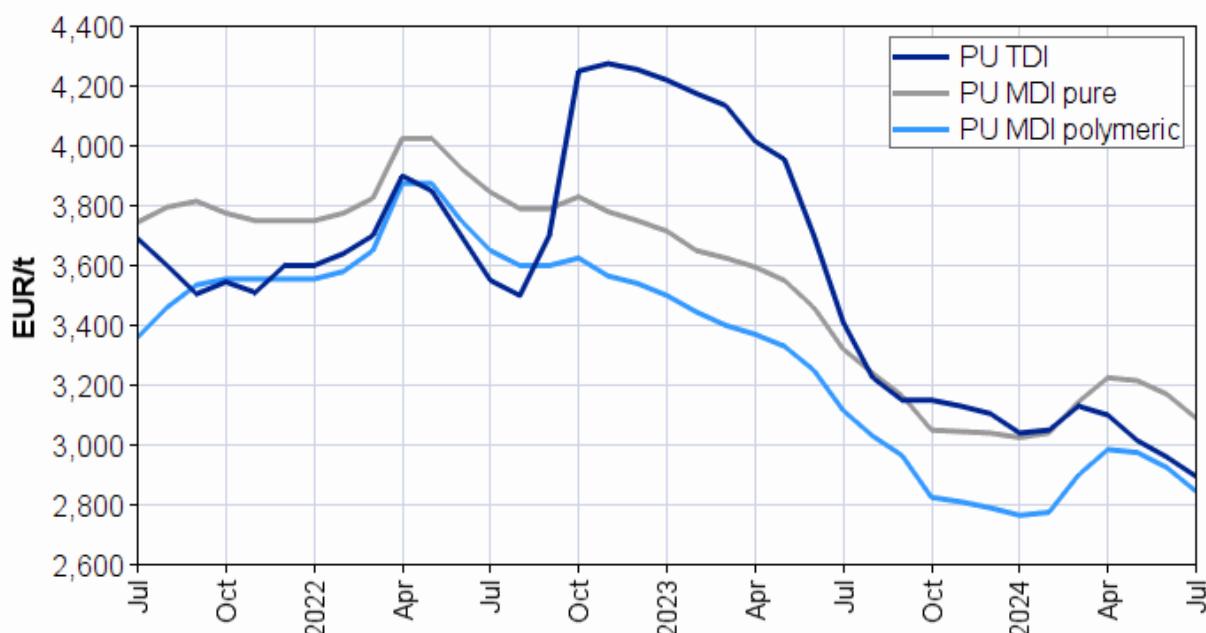
| Crude MDI Nameplate Capacity | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| EMEA | Kta |
| BASF, Antwerp (B) | 650 | 650 | 650 | 650 | 650 | 650 | 650 |
| Covestro, Brunsbuettel(D) | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Covestro, Krefeld (D) | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Covestro,Tarragona (E) | 220 | 220 | 220 | 220 | 220 | 220 | 220 |
| Dow, Estarreja, (PT) | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Dow, Stade (D) | 335 | 335 | 335 | 335 | 335 | 335 | 335 |
| Huntsman, Rotterdam (NL) | 470 | 470 | 470 | 470 | 470 | 470 | 470 |
| Sadara, Jubail (KSA) | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Wanhua, Karincbarikca (HUN) | 260 | 260 | 260 | 260 | 260 | 260 | 260 |
| Total EMEA | 3135 |

| Asia Pacific | Kta |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| BASF / Shanghai Hua Yi,Sinopec Shanghai Gaoqiao Petro Chemical - Caojing | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| BASF Chongqing (PRC) | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Covestro (PRC) | 550 | 600 | 600 | 600 | 600 | 600 | 600 |
| Huntsman/Shanghai Chlor-Alkali Chem Co - Caojing | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| Juli Henshan | 200 | 400 | 400 | 400 | 400 | 400 | 400 |
| Lianheng Isocyanate co (PRC) | 590 | 590 | 590 | 590 | 590 | 590 | 590 |
| Sinopec / Shanghai Gaoqiao - Caojing | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| Tosoh, Ruian) (PRC | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| WanHua Fujian Polyurethane | 25 | 250 | 400 | 400 | 400 | 400 | 400 |
| Wanhua, Ningbo (PRC) | 1200 | 1500 | 1500 | 1500 | 1500 | 1500 | 1800 |
| Wanhua, Yantai, (PRC) | 1100 | 1100 | 1100 | 1100 | 1100 | 1150 | 1200 |
| Total China | 4755 | 5530 | 5680 | 5680 | 5680 | 5730 | 6080 |
| BASF (SK) | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Covestro (J) | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Karoon Petrochemical,Mahshahr,(IRI) | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Kumho Mitsui (SK) | 410 | 610 | 610 | 610 | 610 | 610 | 610 |
| Tosoh (J) | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Tosoh Spliier (VN) | 0 | 0 | 0 | 0 | 50 | 100 | 100 |
| Total Asia w/o China | 1170 | 1370 | 1370 | 1370 | 1420 | 1470 | 1470 |
| Total Asia & China | 5925 | 6900 | 7050 | 7050 | 7100 | 7200 | 7550 |

| Americas | Kta |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| BASF | 500 | 550 | 600 | 600 | 600 | 600 | 600 |
| Covestro | 330 | 330 | 330 | 535 | 740 | 740 | 740 |
| Dow (Freeport) | 340 | 442 | 442 | 442 | 442 | 442 | 442 |
| Huntsman | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| Wanhua | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Total Americas | 2070 | 2222 | 2272 | 2477 | 2682 | 2682 | 2682 |
| Global Total | 11130 | 12257 | 12457 | 12662 | 12917 | 13017 | 13367 |

Source: Nameplate capacities have been compiled and updated using only publicly available information from a variety of published sources including : Belvedere & Partner, Investor Reports, PU Magazine, [pudaily.com](#), [urethaneblog.com](#), Urethanes Technology International, ICIS.com, Market drivers for flexible polyurethane foam and consequences for its main feedstocks Perspective to 2030 – EUROPUR 2021

Chart 16: ISOCYANATE, 2021-2024, AVERAGE PRICES IN EUROPE



Source: Plastics Information Europe

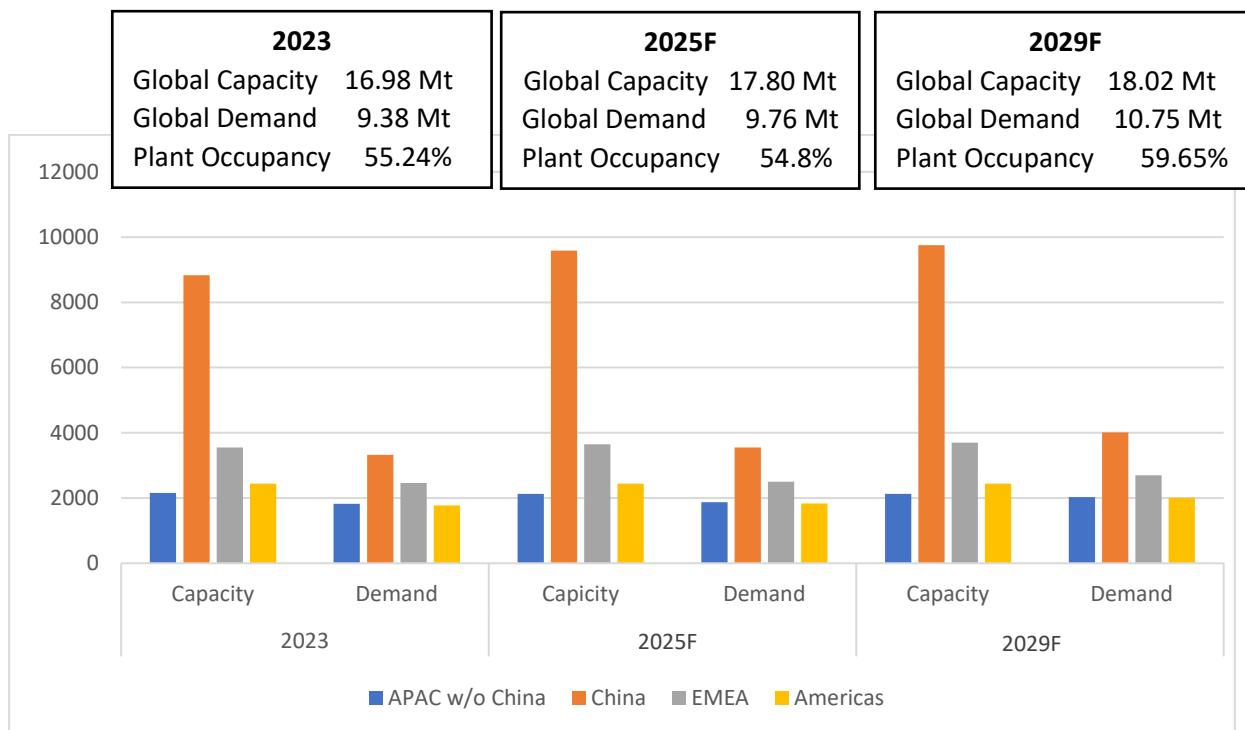
The above chart from PIE (Plastics Information Europe) shows the decline in prices during 2024 following the fall in demand for the resultant end products. Although raw material prices vary from one service provider to the other, the overall trend remains similar.

4.3. Polyols

In 2023, the supply of flexible polyol in Europe began to stabilize after a turbulent 2022. Despite the overall balance in the market, demand remained very low throughout the year. The second half of 2023 saw renewed disruptions due to tensions in the Middle East, which impacted supply through the Suez Canal and caused price volatility. However, by the first quarter of 2024, supply chains had adjusted to the new circumstances, and the situation began to normalize. The trend of low demand has persisted into 2024.

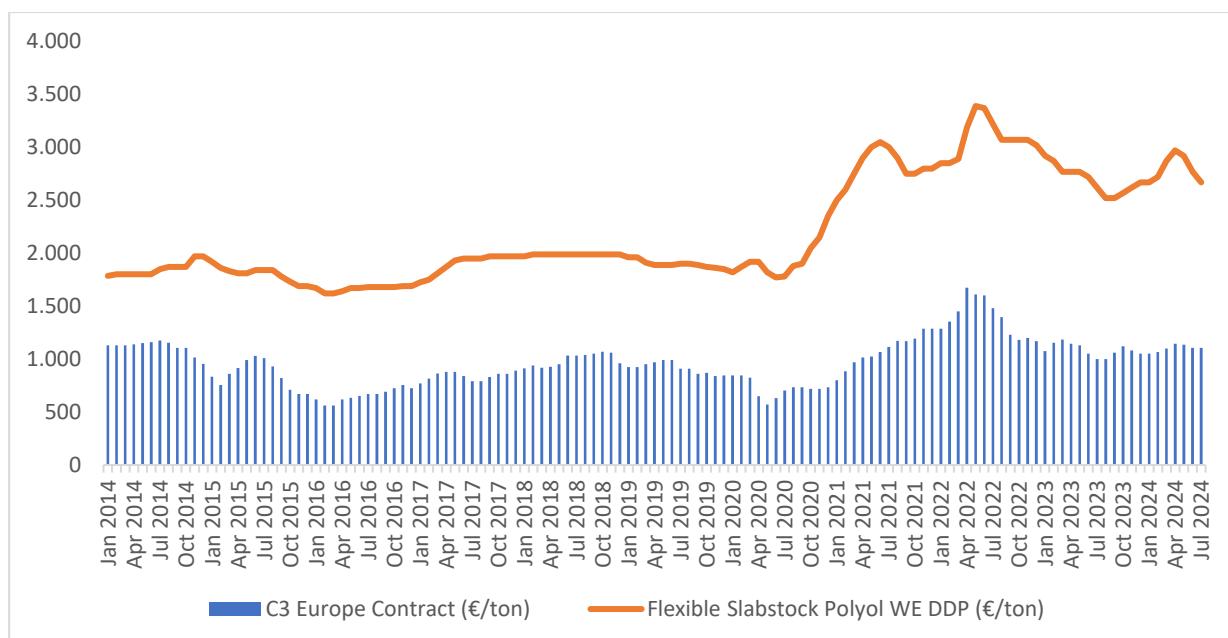
Propylene oxide prices and propylene (C3) prices peaked in 2022, but this changed during 2023 as prices lowered and stabilised around the mid-year. The global production capacity for polyether polyols (flexible and rigid) has continued to expand in recent years with supply keeping well ahead of demand, especially in Asia.

Chart 17: CHANGES IN GLOBAL POLYETHER POLYOL NAMEPLATE CAPACITY & DEMAND 2023-2029 (MT)



Source: LRM, B&P Ltd, Company Announcements

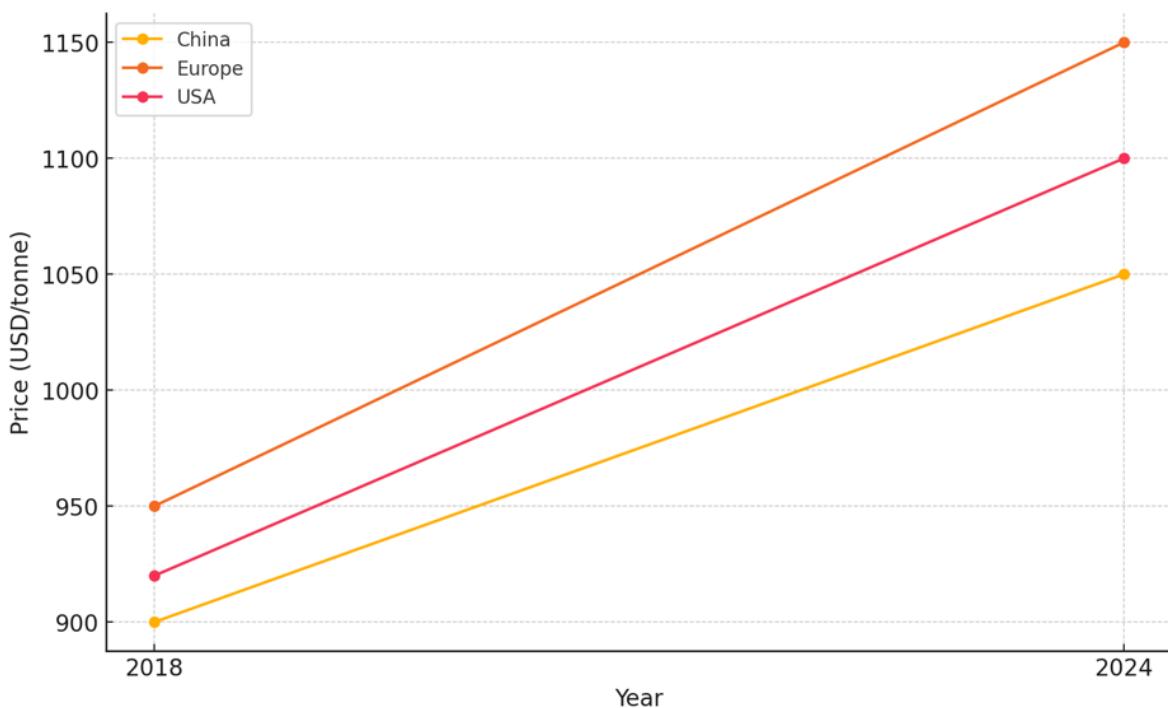
Chart 18: PROPYLENE AND FLEXIBLE SLABSTOCK POLYOL PRICES IN EUROPE 2014 – July 2024



Source: Tecnon Orbichem, used with kind permission

The traditional metric for polyol profitability in the supply of polyether polyols is the price margin over C3, which as shown in the above chart has now been exceeded over the past year's average. But when comparing the major cost driver for Polyether polyols, C3-Propylene Oxide price differentials and volatility can be observed between the three regions, Americas, Europe and APAC. Over the past decade most new Propylene capacity has been added in APAC, mainly in China. This has dramatically increased capacity, which has resulted in greater economies of scale, with newer and more efficient technologies' being used. Regional volatility continues to occur but when average pricing for one calendar year is compared with the other regions a variance can be observed. The spread in 2018 was around \$50/t but is now \$100/t, to date, in 2024. In all years China has been at the bottom of the spread and Europe at the top with USA in the middle. To date in 2024 this could give an advantage of up to \$100/t.

Chart 19: PROPYLENE PRICES COMPARISON, 2018 VS 2024

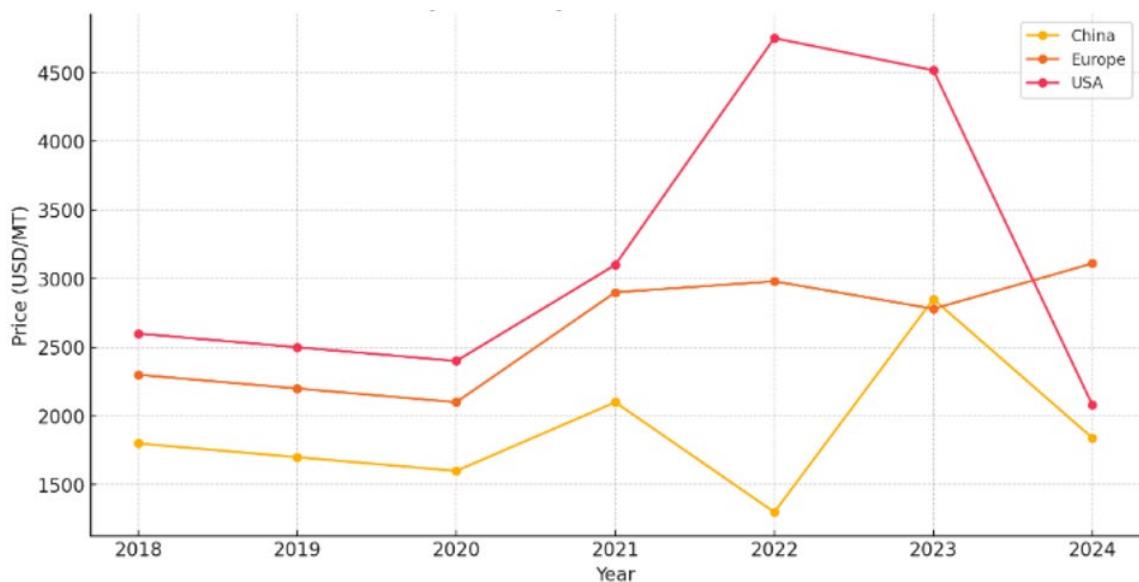


Sources: B&P, ICIS, Chem Analyst

The chart above illustrates the general average price trend over the past six years. However, local pricing remains influenced by short-term supply and demand dynamics, as well as geopolitical events.

Examining the situation downstream, for polyether polyols, reveals significant local pricing diversity. In China, prices were relatively stable but experienced a sharp decline in 2022 due to weak demand and COVID-19-related disruptions. This was followed by a pronounced rebound, driven by increased raw material costs and rising demand, resulting in considerable volatility. In Europe, the energy crisis had a major impact, with "mothballed" and throttled plants causing supply issues amidst weak demand. The U.S. faced similar challenges to Europe, with even steeper price increases in 2022 due to feedstock cost escalations and supply chain disruptions.

Chart 20: POLYETHER POLYOL PRICES, 2018 VS 2024



Sources: B&P, ICIS, Chem Analyst

While the volatility during the pandemic years is evident, the general trend is clear. Over the past 6-7 years, Europe has not consistently experienced the highest prices. Instead, supply chain disruptions and weather-related issues in the U.S. have led to significant price fluctuations, often surpassing those in Europe.

Table 24: GLOBAL POLYETHER POLYOL NAMEPLATE CAPACITY BY LEADING PRODUCER 2023-2029 (F), KTA

| Company | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|--|------|------|------|------|------|------|------|
| EMEA | Kta |
| BASF, Antwerp(B) | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| BASF, Schwarzeide (D) | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Covestro Fos sur Mer (F) | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Covestro, Antwerp (B) | 260 | 260 | 260 | 260 | 260 | 260 | 260 |
| Covestro, Dormagen(D) | 260 | 260 | 260 | 260 | 260 | 260 | 260 |
| Dow Terneuzen (NL) | 570 | 570 | 570 | 570 | 570 | 570 | 570 |
| Dow Tetre (B) | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Dow, Tarragona(E) | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Huntsman (NL) | 54 | 54 | 54 | 54 | 54 | 54 | 54 |
| MOL (HUN) | 100 | 200 | 200 | 200 | 200 | 200 | 200 |
| Nizhnekamskneftekhim (Sibur) & other Russian producers | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| Oltchim (ROM) | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| PCC Rokita, Brezg Dolny (POL) | 130 | 130 | 130 | 155 | 180 | 180 | 180 |
| Repsol Puertollano € | 70 | 70 | 70 | 70 | 70 | 70 | 70 |

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| | | | | | | | |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Repsol, Tarragona (E) | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| Sadara (KSA) | 390 | 390 | 390 | 390 | 390 | 390 | 390 |
| SAIC/ Rabigh (KSA) | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Shell, Pernis (NL) | 255 | 255 | 255 | 255 | 255 | 255 | 255 |
| Others (independent system houses) | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Total EMEA | 3548 | 3648 | 3648 | 3673 | 3698 | 3698 | 3698 |

| Americas | Kta |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| BASF (MX) | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| BASF(US) | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Carpenter (US) | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Covestro (US) 3 plants (NMV, Channelview & South Charleston) | 660 | 660 | 660 | 660 | 660 | 660 | 660 |
| Dow (US) | 515 | 515 | 515 | 515 | 515 | 515 | 515 |
| Huntsman (US) | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Monument (US) | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Others | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Total NAFTA | 2200 |
| South America | | | | | | | |
| Dow (BR) | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Dow (Others) | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Others | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Total South America | 240 |
| Total Americas | 2440 |

| Asia Pacific w/o China | Kta |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|
| Asahi Glass, Kashima (J) | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| BASF(SK) | 170 | 170 | 170 | 170 | 170 | 170 | 170 |
| Covestro (TW) | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dow (Aus) | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Dow (TW) | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Dow/SCG (Thailand) | 279 | 279 | 279 | 279 | 279 | 279 | 279 |
| Huntsman (AUS) | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| KPX (SK) | 230 | 230 | 230 | 230 | 230 | 230 | 230 |
| Kukdo, (SK) | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| Manali (IND) | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| MCNS (SK) | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| MCNS(J) | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| PTPL (IND) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PTT/Sanyo (Thailand) | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| Sanyo (J) | 110 | 110 | 110 | 110 | 110 | 110 | 110 |

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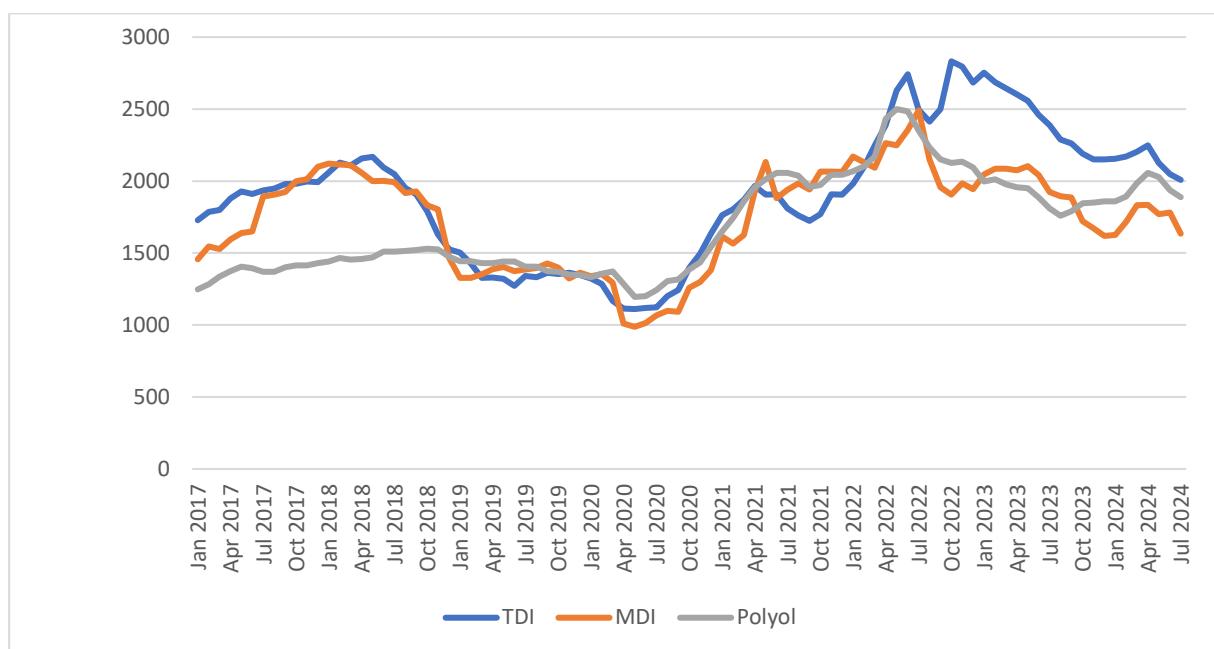
| | | | | | | | |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Shell (SG) | 360 | 360 | 360 | 360 | 360 | 360 | 360 |
| Others (small Japanese manufacturers) | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Total Asia Pacific w/o China | 2159 | 2129 | 2129 | 2129 | 2129 | 2129 | 2129 |

| China | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 12 Others - including Jiangsu Sammu, Ningbo Zhenhai, CITIC, Shandong HuaAn New Materials Co & Gulei | 1980 | 1980 | 1980 | 1980 | 1980 | 1980 | 1980 |
| BASF | 50 | 100 | 200 | 200 | 200 | 200 | 200 |
| Befar Chemical Co Ltd, Binzhou, Shandong. | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Blue Star Dongda, Zibo (PRC) | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| Changhua Polyurethane Co Ltd, Zhangjiagang, Jiangsu | 360 | 360 | 440 | 440 | 440 | 440 | 440 |
| Dexin Lianbang Zibo, Shandong (PRC) | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| Dexin Wudi, Zibo, Shandong (PRC) | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Dow/Zhiang Pacific, Zhangjiagang, (PRC) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Fushan Jiahua | 550 | 550 | 550 | 550 | 550 | 550 | 550 |
| Guangzhou YutianChemicals (PRC) | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Hangjin Technology Co, Ltd (Fangda Jinhua) | 170 | 170 | 170 | 170 | 170 | 170 | 170 |
| Hebei Yadong Chemical Co Ltd, Shijiazhuang, Hebei | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| HongBao Li, Nanjing (PRC) | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| INOV Chemical Co Ltd, Zibo, Shandong | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Jiahua Chemicals, Shanghai Shangdong (PRC) | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| Juyuan Chemical Co Ltd, Jilin | 235 | 235 | 235 | 235 | 235 | 235 | 235 |
| Korea Polyol, Nanjing | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Meizhouwan, Fujian (PRC) | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Nanjing Kumho, Nanjing (PRC) | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| Ningwu Jurong, Juraon (PRC) | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Shandong, Longhua, Zibo (PRC) | 450 | 520 | 520 | 520 | 520 | 520 | 520 |
| Shell/CNOOC, Nanhui, Huizhou (PRC) | 600 | 600 | 930 | 930 | 930 | 930 | 930 |
| SinoChem, Dongda, Quanzhou City, Fujian | 0 | 0 | 120 | 240 | 240 | 240 | 240 |
| Sinopec Shanghai Gaoqiao | 220 | 220 | 220 | 220 | 220 | 220 | 220 |
| Tianjin Degu, Tianjin (PRC) | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Tianjin Petrochemical Co. Tianjin (PRC) | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Tida Chemical | 100 | 100 | 100 | 150 | 150 | 150 | 150 |
| Wanhua, Yantai & Ningbo | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| Total China | 8835 | 8955 | 9585 | 9755 | 9755 | 9755 | 9755 |
| Total Asia Pacific & China | 10994 | 11084 | 11714 | 11884 | 11884 | 11884 | 11884 |
| Global Total Polyether Polyol Capacity | 16982 | 17172 | 17802 | 17997 | 18022 | 18022 | 18022 |

Sources: Nameplate capacities have been compiled and updated using only publicly available information from a variety of published sources including investor reports, PU Magazine, pudaily.com, urethane blog.com, Urethane Technology International, ICS.com, CPUIA, Market drivers for flexible polyurethane foam and consequences for its main feedstocks Perspective to 2030 – EUROPUR 2021

Chart 14, offers a concise summary of fluctuations in European raw material prices over the past six years. This underscores the considerable volatility that has characterised this period. This volatility has reverberated throughout the entire supply chain, engendering significant downstream challenges for industry stakeholders.

Chart 21: KEY RAW MATERIAL PRICE TRENDS IN THE EUROPEAN FLEXIBLE FOAM INDUSTRY (% Change January 2017 - July 2024 in Europe)



Source: Tecnon Orbichem, used with kind permission

From the above chart we see that raw material have levelled out during 2023 creating a more stable environment when compared to previous years. The major driver for the price weakness has been the very low level of demand in the region.

The above information refers to the standard polyols based on raw materials produced from crude oil via crackers. As we have seen in the last few years and also studied in the EUROPUR (2021) report “Market Drivers for Flexible Polyurethane Foam and Consequences for its Main Feedstocks - Perspective to 2030”, the role of recyclates in standard polyether polyols is steadily increasing as well as the use of bio-based polyols. This continues to increase supported by legislation and consumers demands. As the demand for more environmentally acceptable products gains traction, more and more companies are adopting a “Mass balance approach” in their portfolio.

5. SUMMARY & CONCLUSIONS

Concluding, in 2023, the production of flexible polyurethane slabstock foam across Europe (including Russia, Ukraine, Belarus, Kazakhstan, Uzbekistan, and Türkiye) reached 1.32 million tonnes, marking a 1.8% increase compared to 2022. However, the overall picture varies significantly by region. Western Europe experienced notable declines in production, while production levels in Eastern and Southern Europe remained relatively stable. Medium and small foam manufacturers generally performed better than larger companies, with variations in customer portfolios playing a significant role. Larger volume end users appeared to experience the most pronounced downturns during the year.

A deeper analysis reveals a complex regional landscape. Within the European Economic Area and the United Kingdom (EEA+UK), production decreased by 5%, a trend that was offset by significant growth in Eurasia (+41%) and Türkiye (+8%). Notably, these regions represented effectively closed markets for many continental European foam producers. Excluding Eurasia (comprising Russia, Ukraine, Belarus, Kazakhstan, and Uzbekistan) reveals an overall market decline of 2.3% compared to 2022.

Türkiye emerged as a notable outlier, becoming the largest producer of flexible slabstock polyurethane foam in Europe. It now boasts 29 plants operated by 25 different companies, with production capacities ranging from 100 to 25,000 tonnes per year.

Overall production volumes in 2023 were comparable to those in 2019. Despite the mixed regional performance, this data suggests that the industry may have reached a point of relative equilibrium or, otherwise, a “bottoming out”.

To summarise, the research and subsequent member interviews confirm:

- 2023 exceeded expectations. Nevertheless, despite improving raw material availability margins continued to face significant pressure.
- Growth in e-commerce, particularly in the mattress segment, has stagnated. Companies are shifting towards a direct-to-consumer model, adjusting their marketing strategies accordingly.
- The trend towards using lower-density foams has persisted to control costs and meet retailer price points. This trend, which began in recent years, continued into 2023 and 2024, raising concerns about the impact on the quality perception of polyurethane.
- the European mattress industry is increasingly affected by international trade issues. European manufacturers are progressively losing access to the US market, one of the EU's main export markets due to anti-dumping procedures against several EU member states, while at the same time imports from China strongly increase, in particular for cellular plastic mattresses.

- The "bed in a box" sector has evolved, with producers modifying their supply chains. There is an increasing role of industry suppliers in providing finished products, and the market is seeing a rise in imported and rebranded finished goods. The sector has diversified beyond the initial 100% polyurethane mattresses, now including products with micro coils, mini-micro coils, zippered covers, and innovative fabrics.
- The discussion around replacing foams with alternative materials such as fibers and springs continues, though overall volume shifts remain minimal. Rising raw material costs are prompting foam and mattress manufacturers to explore various strategies to improve supply chains and reduce costs. Some upholstery manufacturers are opting for rebonded foams, which sacrifice some comfort to meet price points set by retailers.

Last, in 2023, global automotive markets experienced a significant rebound, growing by nearly 10% and exceeding 72 million units as supply chain issues eased. However, this recovery does not signify a complete return to pre-pandemic conditions. According to LMC Automotive, global light vehicle production rose from 82.5 million units in 2022 to 90.8 million units in 2023, marking a 10% increase. Despite this growth, the sector remains challenging, particularly in the Electric Vehicle (EV) segment, where volumes are declining and imports are increasing.

6. VIEW INTO 2023 & 2024



Despite 2023 surpassing the expectations set at our Budapest Conference, the business environment remains challenging. The persistent issue of weak demand affects not only Europe but also Asia, with China particularly notable in this regard. Although recent GDP figures for this country indicate some improvement, with 5.3% growth in Q1 2024 and 4.7% in Q2 2024, the recovery appears uneven. Growth in Europe remains particularly subdued, with most forecasts predicting that significant recovery will not occur until 2025, and anticipating a relatively stagnant 2024.

Due to the subdued demand environment, input costs for various categories, including raw materials, have declined. However, logistics and shipping costs have experienced volatility, largely influenced by geopolitical events.

The automotive sector faces significant challenges amid the ongoing transition to Electric Vehicles (EVs) and hybrid models, alongside efforts to return production volumes to pre-pandemic levels. According to LMC projections, global production is expected to recover to pre-pandemic levels by 2024, while Europe may not see a full resurgence until 2027. This highlights the persistent difficulties the automotive industry faces as it adapts to these transformative changes.

During the conference, we assessed projections for the end of 2024 in comparison with 2023. The results of the Slido survey are detailed below:

In 2024, European flexible PU slabstock production (in tonnes) will be:

175

Much lower than last year (decrease of more than 5%)



Lower than last year (0-5% decrease)



More or less stable



Higher than last year (0-5% increase)



Much higher than last year (increase of more than 5%)



We also looked at what would be the biggest significant influence on demand for PU foam. Once again, the survey confirms that cost effectiveness remains our most significant challenge.

Which factor do you believe will have the most significant influence on consumer demand for flexible PU foam products in the coming years?

114

Sustainability and environmental considerations



Comfort and performance attributes



Cost-effectiveness and value proposition



Technological advancements and product innovation



What is the most important factor driving innovation in the flexible PU foam industry globally?

0 7 5



Unsurprisingly, the primary driver of innovation continues to be sustainability. It will be interesting to observe the changes when we conduct the survey at our 2025 conference in Alicante, scheduled for June 3rd to 5th, 2025.

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