





PREFACE

The plastic industry is one of the most important actors of the Turkish economy. Today, the contribution of the plastics industry to the country's economy is gradually increasing with the total production exceeding 10 million tons, and 45 billion dollars' worth of turnover, the approaching direct exports of 7 billion dollars.

Our industry, with its production capacity, has reached the second place in Europe and the sixth place in the world. As PAGEV, we continue to lead the industry successfully in the framework of the "Unifying Power" mission of the Turkish Plastics Industry.

We also know that having the right and reliable data and information is the most important part of the solution when we sign the indispensability of Plastics in our lives and sign our work to tackle our industrial problems with concrete steps based on scientific evidence. In this direction we constantly investigate, collect new data, compile, and report them. We present our reports that we believe are important for the development of our industry and our booklets containing valuable information to the plastics industry representatives, stakeholders, and public institutions.

As PAGEV, we prepared a report set that will contribute to the industry in a meaningful way in the face of our long and dedicated research. With our reports, we made booklets with the comments of our expert reporters about the point where the Turkish Plastics Industry is in the right and reliable light, common problems and what should be the search for concrete solutions. We believe that our reports and information set will benefit all our stakeholders, especially our members, and will guide the plastics world. At the same time, we are pleased that our public institutions have reached the most up-to-date and accurate information about the plastics industry.

On the other hand, with our sector reports in English, we think that our colleagues will be able to share the potential of our country's plastics industry with the most up-to-date business partners in the global marketplace.

Hereby, presenting our current reports and information files relating with our industry, we would like to thank all our colleagues who have contributed to this day's achievement of our industry, who has taken a position as a locomotive mission in the development of our country.

Best regards,

Yavuz EROĞLU

PAGEV President

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EXECUTIVE SUMMARY



The average capacity utilization of the plastics sector, which was 75.4% in 2021, increased to 75.9% in 2022 and increased by 0.5 points.

As a result of the increase in capacity utilization rates, the production of plastic products increased by 2% in quantity and 10% on value basis in 2022 compared to 2021 and amounted to 10.5 million tons and 44.2 billion dollars.

In terms of quantity in the plastic products sector, the share of exports in production decreased to 25% in 2022, while the share of imports in domestic consumption remained at 8%.

2022 has been a year of historic record levels for the plastics industry.

In the world economy, which entered 2023 with the expectation of high inflation and economic recession or even recession, it is no longer possible to continue to support investments and consumer demand with financial expansion to private and public sector actors under the burden of debt. Therefore, in 2023, the world economy is expected to enter a difficult and changeable period.

The credit ratings given by the three leading credit institutions for Turkey are stable and extremely risky. Turkey is considered to be an economy that is almost three times riskier than the group it is in.

It is possible to summarize some of the risks that the Turkish economy will face in 2023 as follows. Although it is mostly based on consumption, a high growth rate compared to the world average will decline rapidly in the first half of the year with the base effect, but an inflation rate that will rise equally rapidly after the election, a current account balance that cannot be reduced in response to the exchange rate increase due to the import-dependent nature of production, negative reserves and an economic structure with extremely high risks.



1. ECONOMIC SITUATION

1.1. WORLD ECONOMY

- Throughout 2022, one of the most important agenda items of the global economy has been the tightening steps taken by central banks in the face of inflation and inflation.
- While inflation in developed countries continued to remain at important levels despite the decline seen in recent months, the Fed, the European Central Bank and the Bank of England, which are the main central banks, continued their monetary tightening steps.
- As we begin 2023, concerns have been raised that these tightening steps could cause a global recession by rapidly slowing economic activity.
- Geopolitical developments have also remained one of the most important risk factors that can put pressure on economic activity.
- The Fed, which has raised interest rates in all its meetings since March, raised its policy rate by 50 basis points to a range of 4.25-4.50% at its meeting in December. The Fed, which raised interest rates by 75 basis points in its previous four meetings, thus reduced the rate of interest rate hikes in December.
- According to FED projections, it is seen that growth expectations for 2023 have decreased, inflation and policy rate forecasts have increased.
- The U.S. economy grew by 3.2% in the third quarter of 2022, and macroeconomic indicators painted a weak picture in the last quarter of the year. Industrial production in the country contracted by 0.2% month-on-month in November, while the capacity utilization rate decreased to 79.7%. According to the PMI data for December, the contraction in industrial production continued in the last month of the year, while the services PMI also indicates a loss in economic activity.
- The housing sector continues to be under pressure due to the high mortgage interest rates in the US and the increase in prices.
- In the US, inflationary pressures are continuing, rising above expectations at 7.4% year-on-year.
- European and UK central banks continue to raise interest rates.
- It is estimated that the high course of inflation in Europe will continue and that the Eurozone economy may contract. A recession is expected in half of the Eurozone countries.
- Annual CPI inflation in the euro area fell to 10.1% in November, declining for the first time in 1.5 years, but remained high.
- It is seen that energy prices make the highest contribution to inflation.
- In the Eurozone, PMI data for the last month of the year show that the contraction in the services and manufacturing sectors continues.
- Another central bank that raised its policy rate in December was the Bank of England.
- The Bank of England, which raised interest rates for the ninth consecutive time to reduce inflation, which reached a 41-year high of 11.1% in October in the UK, raised its policy rate by 50 basis points to 3.5%.



- The Bank of Japan left its policy rate unchanged at its meeting on December 20.
- The slowdown in economic activity in China is becoming evident.
- Export volume in China contracted by 8.7% year-on-year in November, its fastest decline since February 2020. Imports also declined by 10.6% during this period.
- In addition to the weak outlook in external demand due to the loss of momentum in global economic activity, pandemic restrictions in the country are also putting pressure on domestic demand and production conditions.
- Industrial production in the country recorded its lowest year-on-year increase since May in November, while retail sales contracted rapidly by 5.9% year-on-year.
- Consumer prices in the country rose by 1.6% year-on-year in November, while producer prices decreased by 1.3% in the same period.
- In 2022, average oil prices increased by 39.8%.
- The commodity market showed a very volatile outlook in 2022 due to the course of global economic activity as well as geopolitical developments.
- The evolution of the tension between Russia and Ukraine into a hot conflict at the end of February caused commodity prices, especially food and energy, to rise rapidly especially in the first half of the year. However, in the second half of the year, despite geopolitical developments, there was no significant interruption in commodity supply and global recession concerns that came to the fore with the tightening steps in monetary policies of the main central banks put commodity prices under pressure again.
- With the effect of the EU's ceiling price application for Russian oil in the last month of the year and the increasing uncertainties regarding global economic activity, the price of a barrel of Brent crude oil fell to 75 USD in December, falling to the lowest levels of about a year.
- However, Russia's keeping the nuclear conflict alternative on the agenda has caused geopolitical concerns, while China's relaxation of pandemic measures has raised expectations that global oil demand may increase, causing oil prices to rise.
- Thus, the average price per barrel of Brent oil increased by 39.8% year-on-year in 2022.
- As central banks turn to high interest rates and tight monetary policies and looking at the large burden of private and public debt, the possibility of a new financial instability or even a financial crisis in the coming year is getting stronger.
- The IMF, the OECD, the European Central Bank expect a slowdown and a global recession in 2023 below the 2.5-3 percent growth rate, which is seen as the recession limit in the world economy.
- The IMF's "World Economy Outlook" report, published in October, expects economic growth in the world economy (excluding the EU region) to decline from 3.2 percent in 2022 to 2.6 percent in 2023 and remain on the recession limit at 3.1 percent and 3.6 percent in 2024 and 2025, respectively.
- In the OECD's "World Economy Outlook" report released in November, the global economic growth rate is expected to decline to 2.2 percent in 2023 and to remain at the level of 2.7 percent in 2024.
- When the expectations of the IMF, the ECB, the World Bank, the OECD are put together, a hard brake on the world economy in 2023 and then a recession of at least 3-4 years, and even a harder and longer recession are seen.



As a result, in the world economy, which entered 2023 with the expectation of high inflation and economic stagnation or even recession, it is no longer possible to continue to support investments and consumer demand with financial expansion to private and public sector actors under debt burden. Therefore, in 2023, the world economy is expected to enter a difficult and changeable period.

1.2. TURKISH ECONOMY

In this period, the main developments that affect and are expected to affect the Turkish economy and therefore the plastics sector are as follows;

- The unemployment rate was 10.2% in November, the employment rate was 48.6% and the labor force participation rate was 54.1%.
- The net minimum wage for 2023 was TL 8,507 and the gross minimum wage was TL 10,008.
- The details of the Age Restrictions in Retirement (EYT) regulation, which has been on the agenda for a while in the public opinion, have also been announced.
- Industrial production declined by 1.3% year-on-year in November.
- The manufacturing PMI indicated that the weak course in the sector continued. In December, the manufacturing PMI increased by 2.4 points to 48.1, its highest level since June, but carried its course below the threshold value to its tenth month.
- In this period, new orders and the contraction in production slowed down, while employment growth was at the highest level in the last ten months.
- Suppliers' lead times improved close to a record in the last month of the year.
- Confidence indices followed a generally positive course in December. The consumer confidence index fell 1.3% month-on-month in December to 75.6 for the first time since June.
- The economic confidence index increased by 0.7 points in December compared to the previous month and was 97.6.
- In the January-November period, exports increased by 13.9%, imports increased by 36.6% and foreign trade deficit increased by 153.4%. In the January-November period, exports amounted to \$ 231.3 billion, imports amounted to \$ 331.1 billion, foreign trade deficit amounted to \$ 99.8 billion and the ratio of exports to imports was 69.9%.
- The current account deficit was USD 359 million in October. The current account posted a surplus of USD 4.1 billion in October 2021, with USD 359 million in October 2022, the lowest deficit in a year.
- In October, net direct investments amounted to USD 743 million. In this period, the direct investments made by non-residents in Turkey increased to the highest level of the last 4 months with 1.02 billion USD.
- Annual CPI inflation declined rapidly in December with the effect of a high base and was at the lowest level of the last nine months at 64.27%. In this period, the annual Yİ-PPI increase also fell to its lowest level since January with 97.72% due to the base effect as well as the downward trend in energy prices.



- In 2022, unlike many economies that try to target and reduce inflation in the face of the
 rising inflation trend after the Covid 19 outbreak, Turkey has aimed to keep growth high
 and to protect and then increase employment and has formulated monetary and fiscal
 policies in line with this framework. To this end, while reducing interest rates, it has also
 reduced various taxes, increased public expenditure, raised the minimum wage and state
 aids.
- With these and similar policies, growth was kept at 7.6 percent in the first half and the unemployment rate at around 10 percent.
- Starting from the third quarter, although the vitality in retail sales demand continues, a falling pace in industrial production is observed. In this context, it is expected that 2022 will be completed with a growth rate of around 5 5.5 percent.
- The renewal of the budget, which started with a size of TL 1.7 trillion in 2022, to TL 2.8 trillion in the middle of the year and the proposal of the initial budget of 2023 as TL 4.4 trillion shows that the budget is gradually out of control.
- Although the depreciation of the TL against the dollar is over 25 percent, the fact that imports do not fall but increase much more than exports is an important problem for the Turkish economy.
- In the first half of 2023, inflation indicators are expected to follow a downward course due
 to the discount to electricity and natural gas used in the industry as well as the high base
 effect. On the other hand, the course to be followed by the domestic exchange rate and
 commodity prices on a global scale is important in terms of the inflation outlook.
- In parallel with the inflation outlook, which has improved slightly in the recent period, the Central Banks slowed down their tightening steps in the December meetings slightly compared to the previous ones and increased their policy rates by 50 basis points each. The messages given by the central bank officials indicate that the tight stance will be maintained until a permanent decrease in inflation is achieved. Opinions that this tightening may cause a recession on a global scale, especially in advanced economies, continue to remain on the agenda.
- In the January-December period of 2022, exports increased by 12.9% compared to the same period of the previous year and amounted to 254 billion 172 million dollars, while imports increased by 34.0% to 363 billion 711 million dollars.
- While the slowdown in the main export markets creates pressure on export volume, it limits the performance of the manufacturing industry.
- The main risks for the Turkish economy are: The ratings of credit rating agencies and the CDS premium. The credit ratings given by the three leading credit institutions for Turkey are stable and extremely risky. The CDS premium, on the other hand, is 610 basis points. Above 300 basis points is considered extremely risky. Since the average risk of developing countries is about 225 points, Turkey is an economy that is almost three times riskier than the group it is in. Although it is mostly based on consumption, a high growth rate compared to the world average will decline rapidly in the first half of the year with the base effect, but an inflation rate that will rise equally rapidly after the election, a current account balance that cannot be reduced in response to the exchange rate increase due to the import-dependent nature of production, negative reserves and an economic structure with extremely high risks.



Sources: T. İş Bankası and Akbank Economic Publications, CBRT and TURK STAT Statistics

	-	2018	2019	2020	2021	2022
GDP	Billion \$	797	761	717	807	693 (3 Q)
Growth Rate	%	3,0	0,9	1,8	11,4	3,9 (3Q)
Inflation	%	20,30	11,84	12,62	36,8	64,27
Unemployment	%	12,9	13,1	12,8	11,2	10,2 (Nov.)
Exports	Billion \$	177,2	180,8	169,6	225,3	254,2
Imports	Billion \$	231,2	210,3	219,5	271,4	363,7
Foreign Trade Balance	Billion \$	-54	-29,6	-49,9	46,1	-109,5
Exports/Imports	%	77	86	77	83,6	69,9
USD / TL	TL	5,32	5,95	7,43	13,28	18,72
EURO / TL	TL	6,08	6,68	9,09	15,10	19,48

Table 1: Turkey's Main Economic Indicators

Sources: T. İş Bankası and Akbank Economic Publications, CBRT and TURK STAT Statistics

2. PLASTIC PRODUCTS INDUSTRY

2.1. CAPACITY UTILIZATION

The average capacity utilization of the plastics sector, which was 75.4% in 2021, increased to 75.9% in 2022 and increased by 0.5 points.

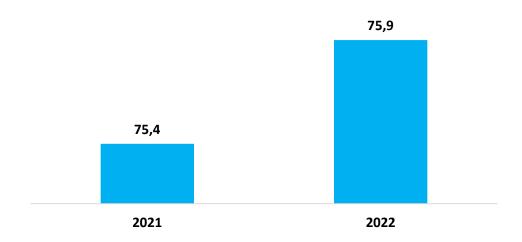


Chart 1: Capacity Utilization in Plastic Products 2022 and 2021 Comparison

Source: CBRT



2.2. PRODUCTION

As a result of the increase in capacity utilization rates, the production of plastic products increased by 2% in quantity and 10% on value basis in 2022 compared to 2021 and amounted to 10.5 million tons and 44.2 billion dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
Million Ton	10,3	10,5	5	2
Billion \$	40,3	44,2	8	10

Table 2: Plastic Product Production

Source: TURK STAT and ITC Trade Statistics

In the last 5 years, the production of plastic products, which has increased by an average of 5% on quantity basis and 8% on value basis per year, reached a historical record level in 2022 in terms of quantity and value.

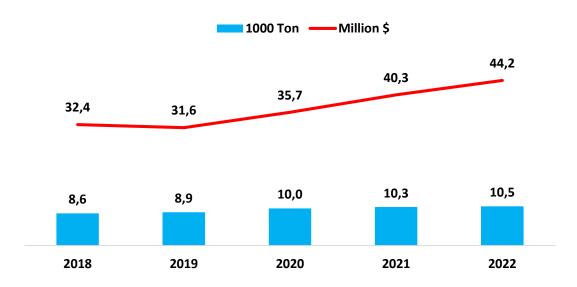


Chart 2: Plastic Product Production - Last 5 Years of Comparison

Source: TURK STAT and ITC Trade Statistics

In 2022, it is seen that plastic packaging materials lead the total plastic product production of 10.5 million tons with approximately 4.41 million tons, while plastic construction materials production follows plastic packaging materials with 2.1 million tons.



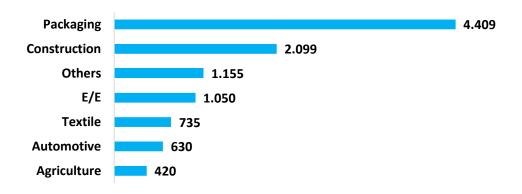


Chart 3: Plastic Products Production by Sub-Sectors - (1000 Tons) - 2022

2.3. MACHINERY EQUIPMENT INVESTMENT OF THE INDUSTRY

The machinery investments of the plastics sector, which increased by an average of 519% per year between 2018 and 2022, increased by 14% in 2022 compared to 2021 and amounted to 1 billion 218 million dollars.

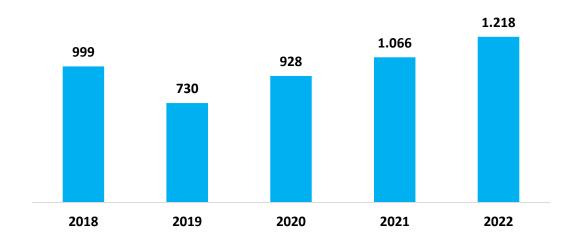


Chart 4: Plastic Processing Machinery Domestic Sales (\$Million)

Source: TURK STAT and ITC Trade Statistics

In the period covering the years 2018-2022, the plastics sector invested an average of 988 million dollars in machinery and equipment per year , and 39% of the total investment consisted of presses and other machines, 20% of injection, 18% extrusion, 4% thermoforming, 3% blowing and 16% parts and parts.



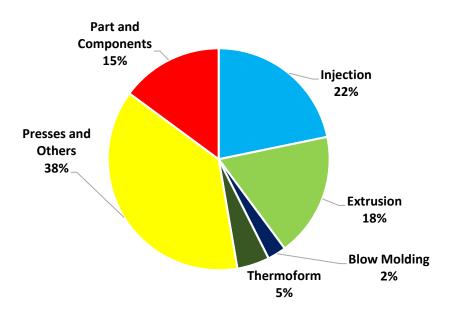


Chart 5: % Distribution of the Sector's Machinery Investment in the Last 5 Years

In 2022, in the total machinery investments of the plastics sector, injection molding machines accounted for 20%, extrusion machines accounted for 19%, blow molding machines 3%, thermoforming machines for 5%, presses and other machinery by 35% and parts and parts by 18%.

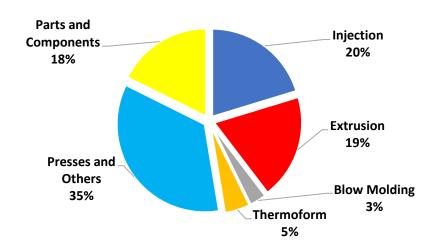


Chart 6: Distribution of Machinery Investment Made by the Plastics Sector (2022)

Source: TURK STAT and ITC Trade Statistics



In 2022, it is seen that the domestic market sales of plastic processing machinery (machinery and equipment investment of the sector) have reached a historical record level by reaching the maximum level.

2.4. FOREIGN TRADE

2.4.1. IMPORT

In 2022, compared to 2021, imports of plastic products increased by 7% on quantity basis and 15% on value basis and increased to 708 thousand tons and 3 billion 877 million dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase (%) 2022/2021
Million Ton	660	708	6	7
Billion \$	3.373	3.877	9	15

Table 3: Imports of Plastic Products

Source: TURK STAT and ITC Trade Statistics

In the last 5 years, imports of plastic products, which have increased by 6% on quantity basis and 9% on value basis per year, reached a historical record in 2022 in terms of quantity and value.

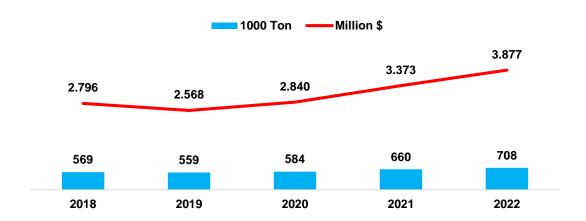


Chart 7: Imports of Plastic Products – Last 5 Years

Source: TURK STAT and ITC Trade Statistics

In 2022, the highest import in terms of quantity and value was realized in the product group with the number 3920 HS CODE (other sheets, sheets, leaves, pellicles, foils, and slides made of plastic). The



imports of the products included in this HS CODE node accounted for 45% of the total imports of plastic products based on quantity and 31% based on value.

HS CODE	PLASTIC PRODUCTS DEFINITIONS	1000 MT	% Share MT	Million \$	% Share \$
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	12	2	69	2
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	50	8	399	9
3918	Floor coverings from plastic – incl. wall and ceiling coverings	25	4	60	2
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	57	8	353	10
3920	Other plate, sheet, pellicles, and slides from plastic	324	45	1.260	31
3921	Other plates, sheets, pellicles, foils, and slides from plastic	69	9	321	8
3922	Bathtub, shower, sink, bidet, water-closet pan, and hardware from plastic	4	1	26	1
3923	Plastic products for moving furniture, tap, cap, capsule	86	12	450	12
3924	Table, kitchen and other household furniture, toiletry form plastic	9	1	57	1
3925	Construction materials from plastic	5	1	34	1
3926	Other goods from plastic	68	11	848	24
	TOTAL	708	100	3.877	100

Table 4: Imports of Plastic Products Based on HS CODE (2022)

Source: TURK STAT and ITC Trade Statistics

2.4.2. **EXPORT**

In 2022, exports of plastic products increased by 1% in terms of quantity and 10% in value terms compared to 2021 and amounted to 2 million 659 thousand tons and 7 billion 834 million dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
Million Ton	2.639	2.659	9	1
Billion \$	7.141	7.834	13	10

Table 5: Export of Plastic Products

Source: TURK STAT and ITC Trade Statistics

In the last 5 years, the average annual export of plastic products: 9% on quantity basis and 13% on value basis, reached a historical record level in 2022.



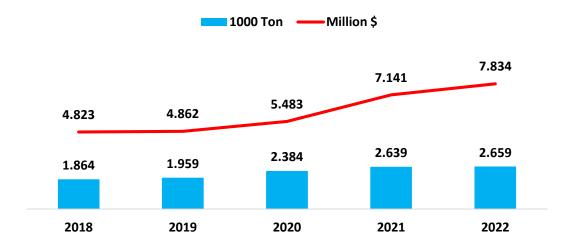


Chart 8: Export of Plastic Products – Last 5 Years

In 2022, the largest exports in terms of quantity and value were realized in the product groups in GTİPs 3920 (sheets, leaves, pellicles and slides other than plastic) and 3923 (plastic products for goods transport packaging, stoppers, caps, capsules). The exports of the products in these HS Code groups accounted for 45% of the total plastic product exports based on quantity and 44% based on value.

HS CODE	PLASTIC PRODUCTS DEFINITIONS	1000 MT	% Share MT	Million \$	% Share \$
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	203	8	462	6
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	291	12	809	10
3918	Floor coverings from plastic – incl. wall and ceiling coverings	57	2	100	1
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	31	1	169	2
3920	Other plate, sheet, pellicles, and slides from plastic	698	26	2.076	26
3921	Other plates, sheets, pellicles, foils, and slides from plastic	224	8	717	9
3922	Bathtub, shower, sink, bidet, water-closet pan, and hardware from plastic	42	2	183	2
3923	Plastic products for moving furniture, tap, cap, capsule	505	19	1.387	18
3924	Table, kitchen and other household furniture, toiletry form plastic	202	8	664	8
3925	Construction materials from plastic	148	6	439	6
3926	Other goods from plastic	260	10	829	11
	TOTAL	2.659	100	7.834	100

Table 6: Exports of Plastic Products by HS Codes (2022)

Source: TURK STAT and ITC Trade Statistics

According to IMMIB statistics, exports of plastics and their products increased by 28.6% in 2022 compared to 2021 and maintained its position as the first exporting sector by increasing its share in total chemical sector exports from 34.6% to 35.5%



		Million \$		% Sł	nare
Commodity Groups	2021	2022	% Artış	2021	2022
PLASTICS AND THEIR PRODUCTS	6.331,0	8.142,4	28,6	34,6	35,5
MINERAL FUELS, MINERAL OILS AND PRODUCTS	3.119,9	4.952,0	58,7	17,0	21,6
ORGANIC CHEMICALS	1.586,8	1.885,1	18,8	8,7	8,2
RUBBE, RUBBER GOODS	1.178,0	1.352,5	14,8	6,4	5,9
PHARMACY PRODUCTS	1.193,8	1.287,8	7,9	6,5	5,6
ESSENTIAL OILS, COSMETICS AND SOAP	1.363,2	1.264,3	-7,2	7,4	5,5
PAINTS, VARNISHES, INKS AND PREPARATIONS	871,4	1.005,3	15,4	4,8	4,4
MISCELLANEOUS CHEMICAL SUBSTANCES	998,4	888,7	-11,0	5,5	3,9
ORGANIC CHEMICALS	523,9	830,1	58,5	2,9	3,6
WASHING PREPARATIONS	573,5	517,1	-9,8	3,1	2,3
FERTILIZERS	303,3	471,2	55,4	1,7	2,1
ADHESIVES, ADHESIVES, ENZYMES	234,6	291,3	24,2	1,3	1,3
GUNPOWDER, EXPLOSIVES AND DERIVATIVES	14,6	17,7	20,9	0,1	0,1
PRODUCTS USED IN PHOTOGRAPHY AND CINEMA	10,9	10,6	-3,0	0,1	0,0
GLYCERIN, HERBAL PRODUCTS, DEGRA, FATTY SUBSTANCES	1,3	1,6	20,7	0,0	0,0
PROCESSED AMYANT AND ITS MIXTURES, PRODUCTS	1,0	0,2	-81,8	0,0	0,0
TOTAL	18.305,7	22.917,9	25,2	100,0	100,0

Table 7: Chemical Sector Exports by Subgroups.

2.4.3. IMPORT AND EXPORT AS OF COUNTRIES

While Turkey imports plastic products from over 100 countries every year, it exports plastic products to 200 countries.

In 2022, imports from 10 countries accounted for 69% of total imports on the basis of quantity and 74% on the basis of value. In this period, it is seen that China has become the country with the most plastic products imports by taking 23% share in terms of quantity and 19% in terms of value from our total plastic product imports, while Germany has become the second largest import market by taking 15% share on quantity basis and 18% share on value basis. Apart from China and Germany, it is seen that Italy, South Korea and France maintain their position as the countries where we import the largest plastic products in total.



In the said period, exports to 10 countries accounted for 50% of total exports based on quantity and 49% based on value. In this period, Iraq, Germany, England, Israel and Italy constituted our largest export markets for plastic products.

		Imports					Exports		
Countries	Million \$	1.000 Ton	\$-%	Ton - %	Countries	Million \$	1.000 Ton	\$-%	Ton - %
China	754	165	19,4	23,3	Iraq	594	261	7,6	9,8
Germany	703	104	18,1	14,8	Germany	542	146	6,9	5,5
Italy	450	69	11,6	9,7	UK	517	196	6,6	7,4
S. Korea	222	38	5,7	5,4	Israel	395	153	5,0	5,8
France	194	32	5,0	4,6	Italy	379	151	4,8	5,7
USA	143	14	3,7	2,0	USA	339	101	4,3	3,8
Belgium	111	24	2,9	3,4	Romania	279	89	3,6	3,3
UK	106	13	2,7	1,8	France	276	80	3,5	3,0
Spain	105	18	2,7	2,5	Spain	245	89	3,1	3,4
Poland	87	13	2,2	1,8	Russian Fed.	242	50	3,1	1,9
10 Countries	2.874	491	74,2	69,3	10 Countries	3.810	1.317	48,6	49,5
Others	1.002	217	25,8	30,7	Others	4.024	1.343	51,4	50,5
TOTAL	3.877	708	100,0	100,0	TOTAL	7.834	2.659	100,0	100,0

Table 8: Imports and Exports of Plastic Products by Countries (2022)

Source: TURK STAT and ITC Trade Statistics

2.4.4. FOREIGN TRADE PRICES

Unit import prices in plastic products are always above unit export prices. In 2022, the average import prices of plastic products were 5.5 \$ / Kg, the average export prices were 2.9 \$ / Kg, and the average import price increased by 7% and the average export price increased by 9% compared to 2021. The fact that unit export prices accounted for 53% of unit import prices in the said period shows the low added value in exports in the sector.

	2021	2022	Increase 2021/2020
Imports Price	5,1	5,5	7
Exports Price	2,7	2,9	9



Table 9: Average Foreign Trade Prices for Plastic Products (\$/Kg)

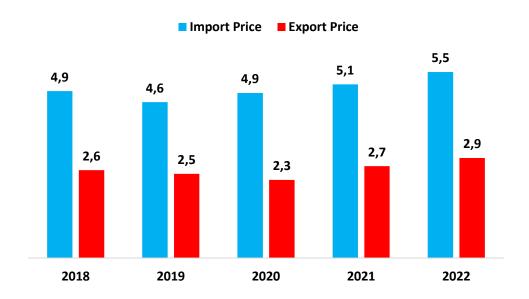


Chart 9: Plastic Products Average Foreign Trade Prices (\$/Kg)

Source: TURK STAT and ITC Trade Statistics

2.4.5. ADDED VALUE CREATED IN EXPORTS

In 2022, the highest value added in plastic products compared to export price is 3919 (Plastic adhesive sheet, sheet, strip, slide, etc.) and 3922 (Plastic adhesive sheet, leaf, strip, slide, etc.) The ratio of the value added created in the products included in the HS Code to the export price was realized as 69.2% and 57.3%, respectively.

However, the share of these products in Turkey's total plastic product exports is as small as 2%. On the other hand, the added value created in products numbered 3920 (other sheets, leaves, pellicles and slides from plastic) and 3923 (plastic products, stoppers, caps, capsules HS Code for goods transport packaging) which has a 31% share in total plastic product exports is 39.8% and 34.7% compared to the unit export price. Considering that the share of these products in total plastic product imports is also high, it is clear that Turkey exports products with lower added value while importing high value-added products. It is inevitable for Turkey to concentrate on the export of products with high added value.



		Added /Kg)	Value Adde	d/ Export Price (%)		
HS Code	2021	2022	2021	2022	Share in Total Exports (%)	Share In Total Imports (%)
3916	0,4	0,5	18,6	21,4	6	2
3917	0,7	1,0	29,2	35,5	10	9
3918	0,0	0,0	0,8	-2,1	1	2
3919	3,8	3,6	69,2	66,9	2	10
3920	1,0	1,2	37,6	39,8	26	31
3921	1,3	1,4	43,9	44,2	9	8
3922	2,3	2,5	57,3	58,6	2	1
3923	0,8	1,0	33,0	34,7	18	12
3924	1,3	1,5	42,5	45,7	8	1
3925	1,0	1,2	36,8	39,8	6	1
3926	1,4	1,4	45,2	44,0	11	24
TOTAL	1,0	1,2	37,2	39,2	100	100

Tablo 10: Value Added Created in Plastic Products Exports

2.4.6. FOREIGN TRADE BALANCE

Turkey always gives surplus in foreign trade of plastic products. In the plastic product sector, a foreign trade surplus of 1 million 952 thousand tons and 3 billion 957 million dollars was given in 2022. Foreign trade surplus increased by 11% on quantity basis and 18% on value basis compared to 2021.

	2021	2022	Increase 2022/2021
1000 Ton	1.979	1.952	11
Million \$	3.768	3.957	18

Table 11: Foreign Trade Balance in Plastic Products

Source: TURK STAT and ITC Trade Statistics

The foreign trade surplus in the plastic product sector reached its historical record in terms of value in 2022.



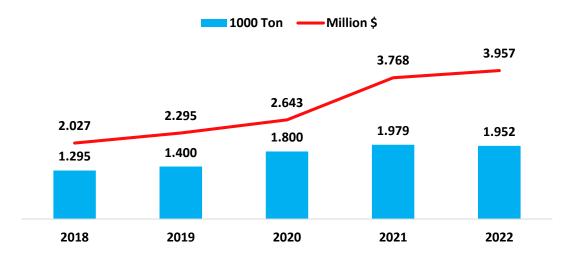


Chart 10: Foreign Trade Surplus in Plastics End Products – Last 5 Years

Source: Turk Stat and ITC Trade Statistics

2.5. DOMESTIC MARKET CONSUMPTION

In 2022, the domestic market demand for plastic products increased by 2% based on quantity and 10% based on value compared to 2021 and amounted to 8.5 million tons and 40.2 billion dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
Million Ton	8,3	8,5	4	2
Billion \$	36,6	40,2	7	10

Table 12: Domestic Market Consumption in Plastic Products

Source: TURK STAT and ITC Trade Statistics

In 2022, domestic consumption in plastic products has reached its historical peak in terms of quantity and value.



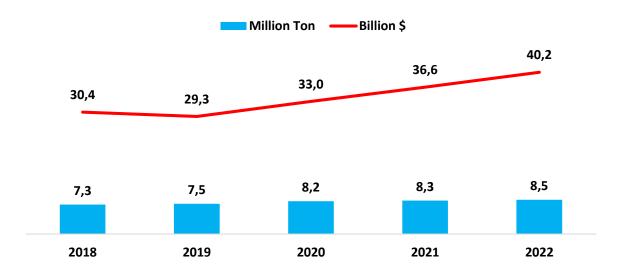


Chart 11: Domestic Market Consumption of Plastic Products - Last 5 Years

Approximately 4.2 million tons of the 8.5 million tons of plastic product domestic consumption realized in 2022 was indirectly exported in the form of semi-finished and finished products through exporter sectors such as automotive, packaging, construction, and electronics. The consumers directly consumed the remaining 4.3 million tons.

2.6. SUPPLY AND DEMAND BALANCE

In terms of quantity in the plastic products sector, the share of exports in production decreased to 25% in 2022, while the share of imports in domestic consumption remained at 8%.

	2021	2022	CAGR (%) 2017-2021%	Increase 2021/2020
Production	10.319	10.497	5	2
Imports	660	708	6	7
Exports	2.639	2.659	9	1
Domestic Consumption	8.339	8.546	4	2
Foreign Trade Deficit	1.979	1.952	11	-1
Exports / Production (%)	26	25		
Imports / Domestic Consumption (%)	8	8		

Table 13: Supply and Demand Balance in the Plastic Products Industry (1000 Tons)

Source: TURK STAT and ITC Trade Statistics



Based on value in the plastic product sector, the share of exports in production remained at 18% in 2022, while the share of imports in domestic consumption increased to 10%.

	2021	2022	CAGR (%) 2017-2021%	Increase 2021/2020
Production	40.332	44.204	8	10
Imports	3.373	3.877	9	15
Exports	7.141	7.834	13	10
Domestic Consumption	36.564	40.247	7	10
Foreign Trade Deficit / Surplus	3.768	3.957	18	5
Exports / Production (%)	18	18		
Imports / Domestic Consumption (%)	9	10		

Table 14: Balance of Supply and Demand in Plastic Products Industry (Million \$)

Source: TURK STAT and ITC Trade Statistics

3. PLASTIC RAW MATERIALS INDUSTRY

3.1. PRODUCTION

In 2022, the total production of plastic raw materials is estimated to be around 1 million 14 thousand tons. 31% of the total plastic raw materials produced in Turkey in the said period consisted of 31% LDPE, 9% of HDPE, 15% of PVC, 12% of PP, 10% of PS and 23% of PET.

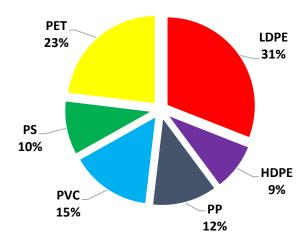


Chart 12: Plastic Raw Material Production (2022)

Source: PETKİM and other manufacturers



3.2. FOREIGN TRADE

3.2.1. IMPORTS

In 2022, imports of plastic raw materials increased by 2% in terms of quantity and 6% in value terms compared to 2021, reaching 8.4 million tons and 15.1 billion dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
Million Ton	8,3	8,4	6	2
Billion \$	14,2	15,1	10	6

Table 15: Imports of Plastic Raw Materials

Source: TURK STAT and ITC Trade Statistics

In the last 5 years, it is seen that the imports of plastic raw materials, which have increased by 6% based on average 2% on quantity basis and 6% based on value, have reached a historical record level in terms of quantity and value in 2022.

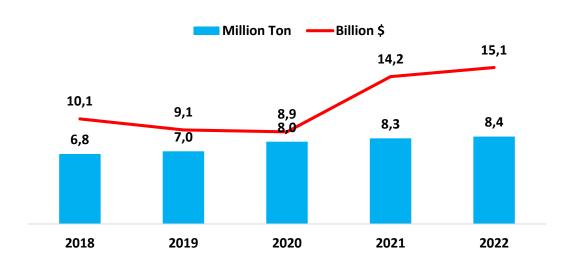


Chart 13: Plastic Raw Material Imports - Last 5 Years

Source: TURK STAT and ITC Trade Statistics



In 2022, the highest imports in terms of quantity and value were polyethylene and polypropylene. The imports made in these two raw materials took 58% share in terms of quantity and 52% in terms of value among the total plastic raw material imports.

HS Code	CN Description	1000 Ton	MT- %	Million \$	\$- %
3901	Ethylene polymers (initial forms)	2.273	27	3.587	23
3902	Propylene and polymers of other olefins (initial forms)	2.405	31	3.737	29
3903	Styrene polymers (initial forms)	387	5	882	6
3904	Other olefin polymers with vinyl chloride/homogenous	876	10	1.476	11
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	51	1	182	1
3906	Acrylic polymers (initial forms)	282	3	698	3
3907	Polyacetals, other polyether's, epoxide-alkyd resins (initial forms)	896	9	2.185	13
3908	Polyamides (initial forms)	139	2	513	3
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	275	3	787	5
3910	Silicones (initial forms)	47	1	269	1
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polytrees	56	1	187	1
3912	Cellulose and chemical derivatives (initial form)	48	1	227	1
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	4	0	50	0
3914	Polymer based ion exchangers (initial form)	8	0	21	0
3915	Wastes, residuals, and scraps from plastic	687	8	297	1
	Total	8.432	100	15.099	100

Table 16: Imports of Plastic Raw Materials by HS Codes (2022)

Source: TURK STAT and ITC Trade Statistics

3.2.2. EXPORTS



In 2022, exports of plastic raw materials increased by 16% in terms of quantity and 30% based on value compared to 2021 and increased to 1.99 million tons and 3.74 billion dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
1000 Ton	1.720	1.991	25	16
Million \$	2.877	3.736	32	30

Table 17: Export of Plastic Raw Materials

Source: TURK STAT and ITC Trade Statistics

In the last 5 years, it is seen that the exports of plastic raw materials, which have increased by 32% based on value and 25% based on quantity on average: quantity basis, have reached the highest level in history in 2022 in terms of quantity and value.

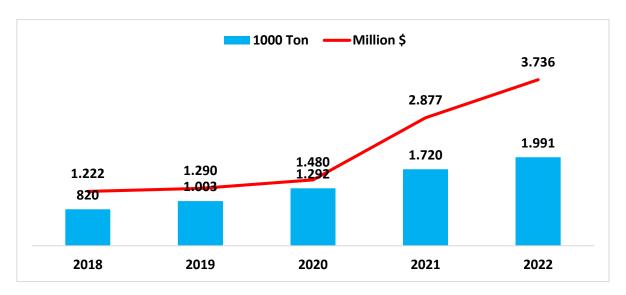


Chart 14: Plastic Raw Material Exports- Last 5 Years

Source: TURK STAT and ITC Trade Statistics

In 2022, the largest export in terms of quantity and value in plastic raw material exports was realized in polyacetals in 3907 HS Code groups and acrylic polymers in 3906. The share of plastic raw materials included in these HS Code from total exports was 36% based on quantity and 37% based on value.

HS Code	CN Description	1000 MT	MT- %	Million \$	\$ - %
Code	CN Description	1000 1411	1411- 70	iviiiioii Ş	J - 70



3901	Ethylene polymers (initial forms)	241	10	354	9
3902	Propylene and polymers of other olefins (initial forms)	109	6	163	4
3903	Styrene polymers (initial forms)	189	11	399	11
3904	Other olefin polymers with vinyl chloride/homogenous	93	2	146	4
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	35	3	82	2
3906	Acrylic polymers (initial forms)	319	18	510	14
3907	Polyacetals, other polyether's, epoxide-alkyd resins (initial forms)	689	36	1.371	37
3908	Polyamides (initial forms)	48	2	159	4
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	171	8	331	9
3910	Silicones (initial forms)	9	0	45	1
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polytrees	4	0	16	0
3912	Cellulose and chemical derivatives (initial form)	64	3	134	4
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	0	0	4	0
3914	Polymer based ion exchangers (initial form)	0	0	2	0
3915	Wastes, residuals, and scraps from plastic	19	1	20	1
	Total	1.991	100	3.736	100

Table 18: Exports of Plastic Raw Materials by HS Codes (2022)

3.2.3. IMPORTS AND EXPORTS BY COUNTRIES

While Turkey imports plastic raw materials from over 100 countries, it exports plastic raw materials to 100 countries.

In 2022, approximately 68% of the total plastic raw material imports based on quantity and 71% based on value were made from 10 countries. In this period, the top 3 in total plastic raw material imports were taken by Saudi Arabia, China and South Korea, and the share of these 3 countries in total plastic raw material imports was 37% on quantity basis and 38% on value basis.

In 2022, 52% of total plastic raw material exports were made to 10 countries based on quantity and 54% based on value. In this period, the top 3 in total plastic raw material exports were taken by the



Russian Federation, Italy and Romania, and the share of these 3 countries in our total plastic raw material exports was 24% based on quantity and 25% on the basis of value.

		Imports					Exports		
COUNTRIES	Million \$	1.000 Ton	\$- %	Ton- %	COUNTRIES	Million \$	1.000 Ton	\$- %	Ton- %
S. Arabia	2.499	1.696	16,6	20,1	Russian Fed.	401	152	10,7	7,6
China	1.620	738	10,7	8,8	Italy	312	173	8,3	8,7
S. Korea	1.560	704	10,3	8,3	Romania	236	150	6,3	7,6
Germany	1.257	489	8,3	5,8	Germany	214	106	5,7	5,3
Belgium	883	437	5,8	5,2	Spain	203	103	5,4	5,1
USA	813	462	5,4	5,5	Egypt	151	86	4,0	4,3
Russian Fed.	647	486	4,3	5,8	Bulgaria	147	107	3,9	5,4
Spain	511	279	3,4	3,3	Israel	121	73	3,2	3,7
Netherlands	493	248	3,3	2,9	USA	118	48	3,2	2,4
Italy	487	195	3,2	2,3	İran	118	42	3,2	2,1
10 Countries	10.770	5.734	71,3	68,0	10 Countries	2.021	1.041	54,1	52,3
Others	4.330	2.699	28,7	32,0	Others	1.715	951	45,9	47,7
TOTAL	15.099	8.432	100,0	100,0	TOTAL	3.736	1.991	100,0	100,0

Table 19: Imports and Exports of Plastic Raw Materials by Countries (2022)

Source: TURK STAT and ITC Trade Statistics

3.2.4. FOREIGN TRADE UNIT PRICES

In 2022, the average unit import price of plastic raw materials was $1.79 \$ / Kg export prices were around $1.88 \$ / Kg and compared to 2021, the import price increased by 4% and the export price increased by 12%.

	2021	2022	Increase 2022/2021
Import Price	1,72	1,79	4
Export Price	1,67	1,88	12

Table 20: Average Foreign Trade Prices of Plastic Raw Materials (\$/Kg)





Chart 15: Average Foreign Trade Prices of Plastic Raw Materials

Source: TURK STAT and ITC Trade Statistics

3.2.5. FOREIGN TRADE DEFICIT

Turkey is a country that has a continuous deficit in plastic raw material foreign trade. In 2022, the plastic raw material foreign trade deficit was 6.4 million tons and 11.4 billion dollars. It is seen that the foreign trade deficit increased by 2% based on quantity and by 6% based on value compared to 2021.

At the end of 2021, the plastic raw material foreign trade deficit is expected to increase by 5% on quantity basis and 51% on value basis compared to 2021.

	2022	2022	Increase 2022/2021
Million Ton	-6,6	-6,4	2
Billion \$	-11,3	-11,4	6

Table 21: Foreign Trade Deficit in Plastic Raw Materials

Source: TURK STAT and ITC Trade Statistics

In 2022, the plastic raw material foreign trade deficit has reached a historical record level in terms of value.



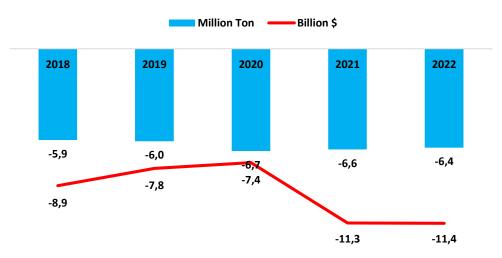


Chart 16: Plastic Raw Material Foreign Trade Deficit - Last 5 Years

3.3. DOMESTIC MARKET CONSUMPTION

Domestic market demand for plastic raw materials decreased by 1% in 2022 compared to 2021 based on quantity and increased by 1% in terms of value, amounted to 7.46 million tons and 13.2 billion dollars.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
1000 Ton	7.567	7.455	2	-1
Million \$	13.060	13.222	6	1

Table 22: Domestic Market Consumption of Plastic Raw Materials

Source: TURK STAT and ITC Trade Statistics

In 2022, it is seen that the domestic market consumption of plastic raw materials has reached the highest level in its history in terms of value.



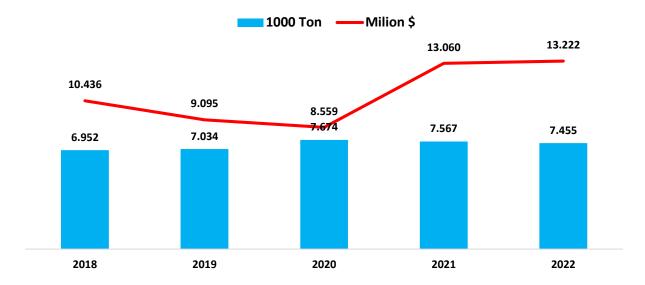


Chart 17: Domestic Market Consumption of Plastic Raw Materials in the Last 5 Years

3.4. SUPPLY AND DEMAND EQUILIBRIUM

In 2022, 89% of the supply of plastic raw materials was met by imports.

	2021	2022	CAGR (%) 2018-2022%	Increase 2022/2021
Production	1.014	1.014	0	0
Imports	8.273	8.432	6	2
Exports	1.720	1.991	25	16
Domestic Consumption	7.567	7.455	2	-1
Foreign Trade Deficit / Surplus	-6.553	-6.441	2	-2

Table 23: Supply and Demand Balance in Plastic Raw Materials (1000 Tons)

Source: TURK STAT and ITC Trade Statistics

3.5. 2023 EXPECTATIONS

In 2023, the world economy is expected to enter a difficult and changeable period. The possible risks expected in the Turkish economy in 2023 are estimated as a high growth rate compared to the world average, although it is mostly based on consumption, an inflation rate that will rise at the same pace after the election, although it will decline rapidly in the first half of the year with the base effect, a current account balance that cannot be reduced against the exchange rate increase due to the import-



dependent nature of production, and negative reserves. Although it is difficult to make long-term predictions due to the negative developments seen in the economic conjuncture, the plastics sector is likely to grow by 4-5% in 2022.

4. CONCLUSION

Negative developments in the world and Turkish economy make it difficult to compete with the stagnant or even declining sales prices in the plastics sector and narrow the profit margins.

One of the most important problems of the sector is the inability to provide sufficient added value. There are 2 main ways to provide higher added value in production and export. These; to manufacture innovative products with high added value and / or to increase profit margin by reducing costs without sacrificing quality. It is inevitable for the sector to produce in European standards and in harmony with the environment to increase competitive production and export opportunities in global markets without sacrificing quality.

The important thing is to produce raw materials with high added value in Turkey. The taxes paid by the sector while importing mortar raw materials such as polypropylene and polyethylene, which cannot meet its needs domestically, adversely affect competition. When we eliminate these negativities, it is known that the plastic sector will further increase the added value it provides to the Turkish economy.

Another important problem of the sector is that although only 15% of the raw material needs are met by domestic production, in order to protect domestic production, it is deprived of the opportunities to supply raw materials at more economical prices by imposing taxes on imports. This situation reduces the sector's competitive export opportunities in global markets in order to protect the domestic raw material producer. Instead of imposing taxes on raw material imports, domestic producers should be protected by applying incentives to reduce production and investment costs. If the production of plastic raw materials does not meet the need, obstacles to imports must be removed.

Plastic raw material prices are increasing rapidly in Turkey. This is an important problem that prevents competitive production and exports in the plastic product sector. The abolition and abolition of import and surveillance duties on plastic raw materials and the priority of domestic plastic raw material producers over exports to domestic producers in their sales are seen as essential for the short-term solution of the problem.

PAGEV offers solutions to both the public and economic management regarding astronomical price increases in raw material prices. First of all, the domestic petrochemical company should sell the already scarce raw material to the domestic market instead of exporting it, and the extra taxes imposed on imported raw materials should be temporarily suspended.



The temporary suspension of duties such as reference price, surveillance, anti-dumping, additional liability on imported raw materials will bring partial relief.

The biggest problem of industrialists at the moment is access to finance. For the first time in the last 15-20 years, there is a serious increase in those who postpone their payment checks and those who cannot make their payments at maturity. This is a serious alarm.

The financing bottleneck that companies are in magnifies the collection crisis in the market. The number of companies that cannot make their payments at maturity and postpone their checks is increasing day by day. Real sector representatives predict that the cash shortage in the market will increase even more.

What scares firms the most is that the collection crisis is growing, and bankruptcies are starting. Unable to convert market debt due to reduced access to commercial credit, many companies have begun to use liquidation, signage replacement or concordat options.

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The only way out for companies is to create financing with prepaid exports. Another solution proposal is that payments to SMEs should be made by large-scale companies, especially retail chains, with maturity limitations. The most important pillar that creates disruption in companies' access to finance is commercial loans. It is a well-known fact that the average enterprise in Turkey returns most of its commercial activities with commercial loans. Based on this, the fact that commercial credit growth is below inflation is one of the data that best describes congestion.

There is an increase in the number of enterprises that cannot pay their debts at maturity. To solve all these problems, the Credit Guarantee Fund support should be increased to 250-300 billion TL.







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