



PAGEV

TURKISH PLASTICS INDUSTRY FOLLOW-UP REPORT 2017



**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 9 million tons, and 35 billion dollars' worth of turnover, the approaching direct exports of 5 billion dollars and the annual growth of 12% for the last 10 years. 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 important 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 serious way in the face of our long and dedicated researches. 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 of 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 of 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 Organization for Economic Co-operation and Development (OECD) reported in its Economic Outlook report in late November that the recovery in the global economy continues to strengthen and continues to expand. The OECD, which rose 0.1 points for the world and US economy in 2017, dropped 0.1 points for the UK and Japan economies.

Turkey's economy showed the strongest growth performance over the last 6 years by expanding expectations by 11.1% in the 3rd quarter of 2017 compared to the same period of the previous year, according to the chained volume index.

Considering the 9 month realizations of 2017, at the end of the year on amount basis; It is expected that production will increase by 9.4%, imports by 5.2%, exports by 3.1%, domestic consumption by 10.3% and foreign trade surplus by 1.8%. The share of exports in production is expected to decrease from 17% to 16% and the share of imports in domestic consumption with 7% will stay at the same amounts. Ratio of exports to imports will increase from 263% to 258%.

Generally speaking; Emerging and developing economies face negative conditions and geopolitical tensions are increasing the challenges of the global economy. Three main factors that will affect the global economy in 2018 are: It is estimated that the Fed will increase the interest rates, the developments in Chinese economy and fluctuations and unstable commodity prices.

Considering the economic growth estimated at 5% in 2018 and the 14-year average correlation coefficient of the industry, it is estimated that the plastics industry will grow by around 5% in 2018. However, in the world economy, and especially in Turkey's export markets, if the developments are more negative, it is possible that the growth of the plastic sector will be shaped at lower levels.



1. ECONOMIC SITUATION

1.1. WORLD ECONOMY

US economy grew 3.2% in the third quarter of 2017. The data released in the US showed that the country's economy maintained its strong outlook in the last quarter of the year.

The Euro Area is on the recovery track, with regional growth forecasts estimated at 2.4% for 2017, 2.3% for 2018 and risk-adjusted for growth outlook. The data shows that the region continues to recover consistently, the unemployment rate is at its lowest level since the global crisis, and economic activity displays a positive outlook.

Oil prices showed a sharp rise in December. By the end of 2017, the barrel price of Brent crude oil increased by 21.1% year on year to reach 67.3 USD.

The Organization for Economic Co-operation and Development (OECD) reported in its Economic Outlook report in late November that the recovery in the global economy continues to strengthen and continues to expand. The OECD, which rose 0.1 points for the world and US economy in 2017, dropped 0.1 points for the UK and Japan economies.

	2017	2018
World	3.6	3.7
USA	2.2	2.5
Euro Zone	2.4	2.1
Germany	2.5	2.3
Japan	1.5	1.2
UK	1.5	1.2
China	6.8	6.6
Brazil	0.7	1.9
Turkey	6.1	4.9

Table 1: OECD Growth Expectations

Source: OECD

OECD, has revised the estimates of Turkey's economy to higher rate compared to June and 2017. Growth forecast for Turkish economy has increased to 6.1% for 2017 and 4.9% for 2018. The third quarter growth of the US economy, previously announced at 3%, has been revised to 3.3%. In the last quarter, economic activity is also showing a positive performance.

Generally speaking; Emerging and developing economies face negative conditions and geopolitical tensions are increasing the challenges of the global economy. Three main factors that

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will affect the global economy in 2018 are: It is estimated that the Fed will increase the interest rates, the developments in Chinese economy and fluctuations and unstable commodity prices.

1.2. TURKISH ECONOMY

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

- ✓ Turkey's economy showed the strongest growth performance over the last 6 years by expanding expectations by 11.1% in the 3rd quarter of 2017 compared to the same period of the previous year, according to the chained volume index.
- ✓ It is seen that the private consumption expenditure is the item that gives the highest contribution with 7 points to the growth rate in the third quarter. Investment expenditures gave the second highest contribution after private consumption expenditures to the growth rate by 3.6 points in the third quarter of the year.
- ✓ When the GDP data is analyzed according to the production method, it is seen that services and manufacturing sectors have a significant affects to increase the growth rate. While the services sector added 5.7 points to growth in this period with the support of the recovery in tourism, the industry made the highest contribution of the last 6 years with 2.6 points.
- ✓ In 2017, exports increased by 10.2% to 157.1 billion dollars and imports increased by 17.7% to 233.8 billion dollars compared to the previous year. In 2017, the foreign trade deficit increased by 36.8% compared to 2016, while the import coverage ratio of 71.8% in 2016 fell to 67.2% in 2017.
- ✓ In 2017, the share of high technology products in the exports of manufacturing industry products is 4.5% and the share of medium high technology products is 36.3%.
- ✓ The share of manufacturing industry products in total imports is 81%. In this period, the share of high technology products in imports of manufacturing industry products is 16.8% and the share of medium high technology products is 40.3%.
- ✓ In 2017, the external demand especially from European countries has affected the trend of the export volume of Turkey positively. On the import side, strong performance in domestic economic activity was influenced by the rapid increase in oil prices, the movement of gold trade and the decisions taken to support the economy.
- ✓ In 2018 the positive developments in European economy will continue to contribute to the positive trend in Turkey's export volume compared to 2017 and the domestic demand is projected to follow a more moderate course.

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- ✓ Parallel to this, it is predicted that rapid expansion observed in foreign trade may lose some momentum. On the other hand, the possibility that the current high levels of oil prices to be permanent, is considered to be the most significant risk factor on the trade balance. In October, unemployment rate decreased by 1.5 points compared to the same period of previous year and realized as 10.3%.
- ✓ Industrial production increased by 7.3% year-on-year in October.
- ✓ The manufacturing PMI, which was 52.9 in November, rose to 54.9 in December.
- ✓ In December, the domestic capacity utilization rate (CUR) increased by 0.9 percentage points compared to the previous period of last year, reaching 79%.
- ✓ The real sector confidence index declined by 2.9 points month-on-month in December to 103.3, the lowest level since January 2017.
- ✓ The current account deficit has deteriorated along with the expansion in the foreign trade deficit. In the first ten months of the year, current account deficit expanded by 33.7% compared to the same period of the previous year and reached to 35.3 billion dollars
- ✓ The annual inflation rate with 11.92% and the annual producer's price index with 15.47% realized at a high level in 2017.
- ✓ In general, it is understood that economic growth in the period of 2018-2019, will be a preliminary plan with the support of fiscal policies, while expansionary fiscal policies will be predicted by 2020.

Although some positive developments observed in the world and Turkish economy, risk factors will continue. For this reason, uncertainty is generally predicted to lead to escape from risks and use of cautious resources.

(Source: T.Ş Bank and Akbank Economic Publications, Ministry of Development, Turk Stat & ITC Statistics)

		2014	2015	2016	2017
GDP	Billion \$	935	861	857	616 (3. Q)
Growth Rate	%	5.2	6.1	2.9	11.1 (3. Q)
Inflation	%	8.2	8.8	8.53	11.92
Producer's Price Index	%	6.4	5.7	9.94	15.47
Unemployment	%	10.4	10.3	12.0	10.7 (October)
Exports	Billion \$	157,6	143,9	142,6	157
Imports	Billion \$	242,2	207,2	198,6	234
Foreign Trade Balance	Billion \$	-84,6	-63,3	-56,0	- 77
Exports/Imports	%	65.1	69.5	71.8	67
Current Balance/GDP	%	-4.7	- 3.7	- 3.8	
Budget Balance/GDP	%	-1.1	-1.0	- 1.1	

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Total Debt Stock	Billion \$	614,1	612,1	677,6	890,8
USD/TL	TL	2,3290	2,9207	2,9207	3,7916
EURO/TL	TL	2,8297	3,1867	3,1867	4,5530

Table 2: Turkey's Main Economic Indicators

Source: Turk Stat, Ministry of Economy, under secretariat of Treasury, Central Bank Turkey

2. PLASTICS END PRODUCTS INDUSTRY

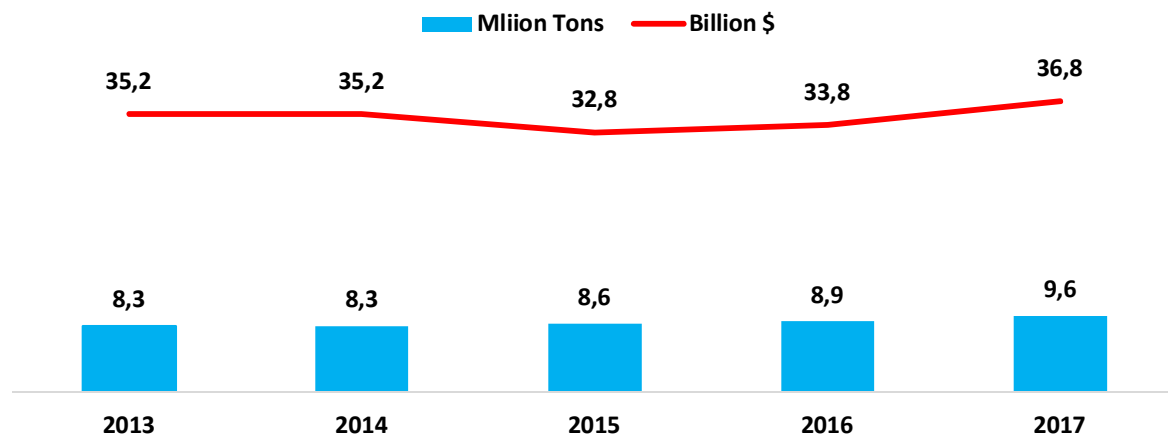
2.1. PRODUCTION

The production of plastics end products which was 8.3 million tons and 35.2 billion dollars in 2013 has annually increased on average by 3.7% on amount and 1.1% on a value basis in the last 5 years and reached to 9.6 million tons and 36.8 billion dollars in 2017.

	2013	2016	2017	% Increase 2017/2016	CAGR (%) 2013-2017
1000 Tons	8,3	8,9	9,6	8.5	3.7
Million \$	35,2	33,8	36,8	9.0	1.1

Table 3: Plastics End Products Production

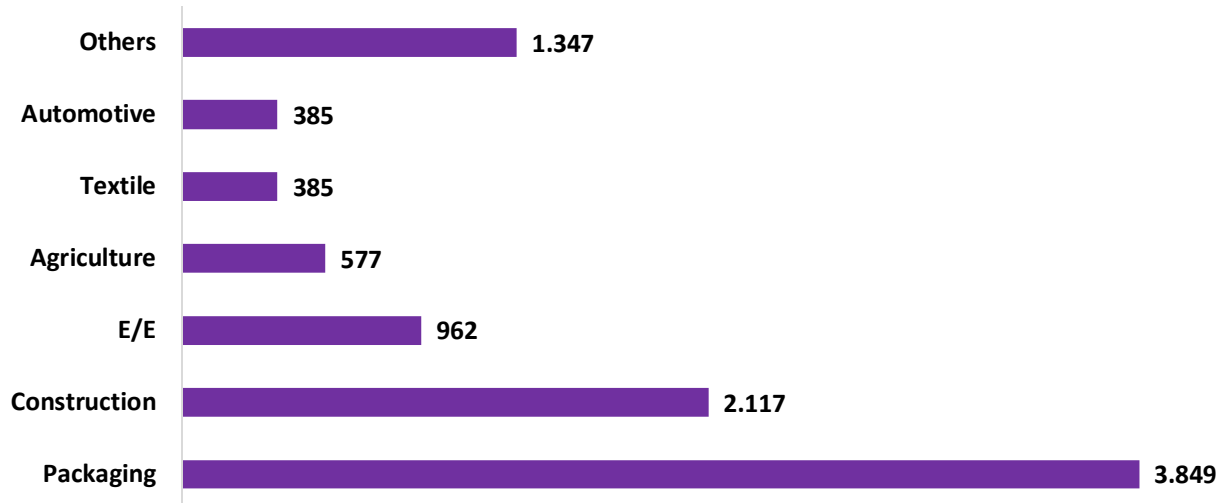
Source: Turk Stat & ITC Trade Statistics

**Graphic 1: Plastics End Products Production**

Source: Turk Stat & ITC Trade Statistics

It is seen that plastic packaging materials with 3,8 million tons ranked the first and was followed by plastic construction materials with about 2 million 117 thousand tons, in total plastic products production of 9.6 million tons in 2017.

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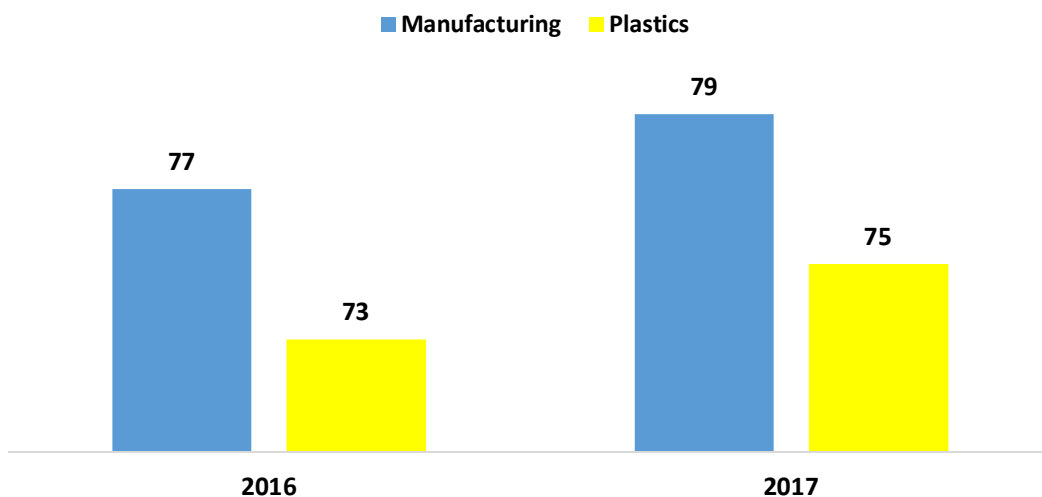


Graphic 2: Production by Subsectors – 2017 (1000 Ton)

Source: TÜİK & ITC Trade Statistics

2.2. CAPACITY UTILIZATION

The average capacity utilization rate in the plastics industry in 2017 realized as 75%, which is 4% below the average capacity utilization of the general manufacturing industry by 79%. Capacity utilization in 2017 with respect to 2016, increased by 2 points in the general manufacturing and in the plastics industry.



Graphic 3: Capacity Utilization in Plastics Industry (%)

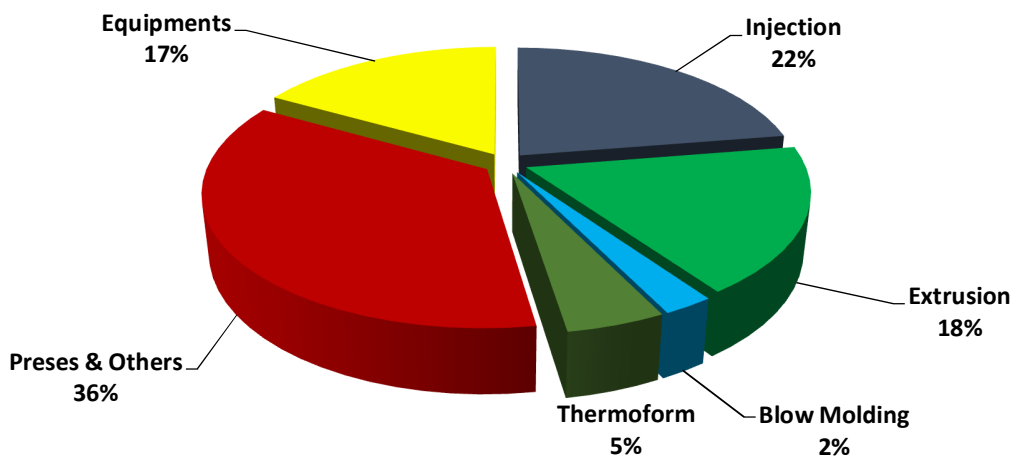
Source: Turk Stat & ITC Trade Statistics

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2.3. MACHINERY INVESTMENTS

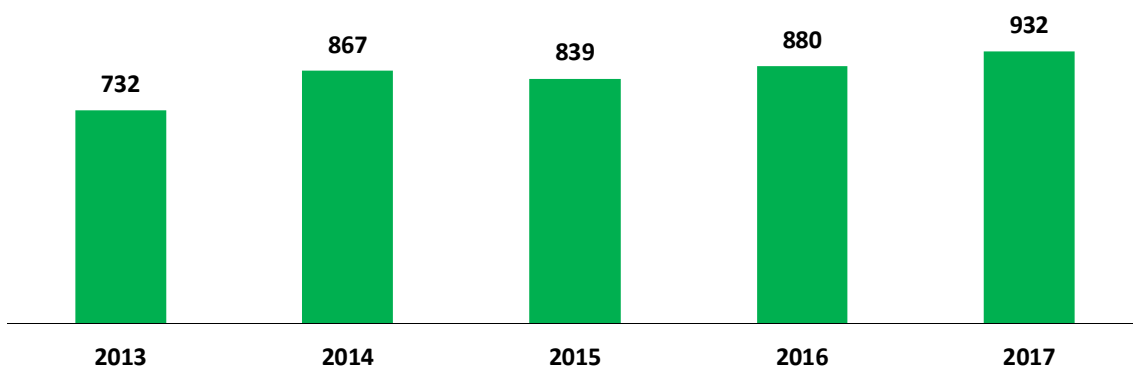
In the period of 2013-2017 including the last 5 years, an average of 850 million dollars of machinery and equipment investment has been realized in plastics industry, 36% of total investment is made by presses and other machines, 22% by injection, 18% by extrusion, 5% by thermoform, 2% of them were blow molding and 17% were parts and parts.



Graphic 4: Machinery and Equipment Investment of Plastics Industry between 2013 – 2017 Period (%)

Source: TÜİK & ITC Trade Statistics

The investment of machinery equipment in the plastics industry was realized as 932 million dollars in 2017. With the same trend, it is estimated that the machinery and equipment investment of industry will exceed 1 billion dollars in 2018.



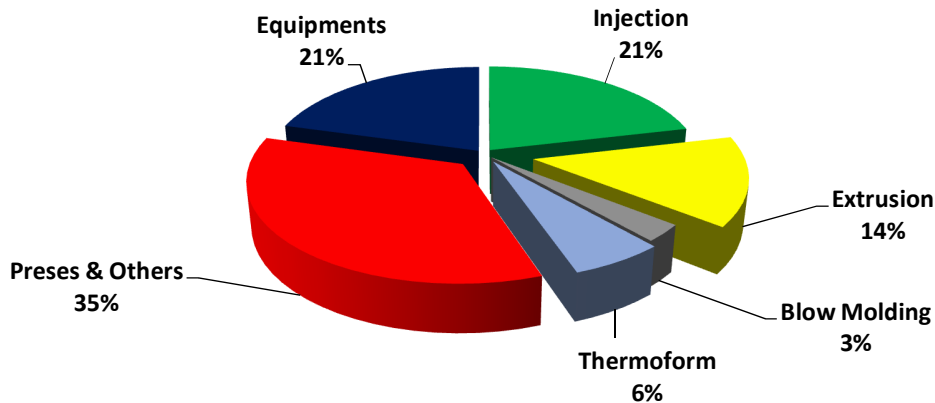
Graphic 5: Machinery and Equipment Investments of Plastics Industry (Million \$)

Source: TÜİK & ITC Trade Statistics

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By 2017, 35% of the total investment of \$ 932 million in the plastics industry was realized by presses and other machineries, 21% by injection machines, 14% by extrusion machines and 21% by parts and components. Thermoforming and blow molding machines accounted for 3% and 6% share of total investment respectively.



Graphic 6: Machinery and Equipment Investments of Plastics Industry (2017)

Source: Turk Stat & ITC Trade Statistics

2.4. FOREIGN DIRECT CAPITAL INVESTMENTS

Between 2002 - 2017 period, about 1 billion 629 million dollars of direct foreign capital investment has been realized in plastics industry. This amount of investment constitutes 1% of all foreign investments in Turkey and 4, 7% of the foreign direct investments in manufacturing industry.

Industries	Million \$	% Share in Total	% Share in Manufacturing Industry
Food-beverage tobacco	8,427	5.8	24.5
Chemistry	5,322	3.7	15.5
Refined petroleum products	4,327	3.0	12.6
Basic metal industry	3,653	2.5	10.6
Computer-electronic and optical products	3,562	2.4	10.4
Textile-clothing-leather	2,094	1.4	6.1
Non-metallic products	1,823	1.3	5.3
Plastic	1,629	1.1	4.7
Transport vehicles	1,406	1.0	4.1
Paper	788	0.5	2.3
Machine-equipment	720	0.5	2.1
Furniture	551	0.4	1.6
Wood & Timber Products	98	0.1	0.3

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Total Manufacturing	34,400	23.6
Total Investment	145,494	100

Table 4: Foreign Direct Capital Investments by Industries

Source: Ministry of Economics

2.5. FOREIGN CAPITAL VENTURE COMPANIES

By the end of 2017, there are 389 foreign capital venture companies in Turkish plastics industry 202 of which are of European origin sharing 52% of total.

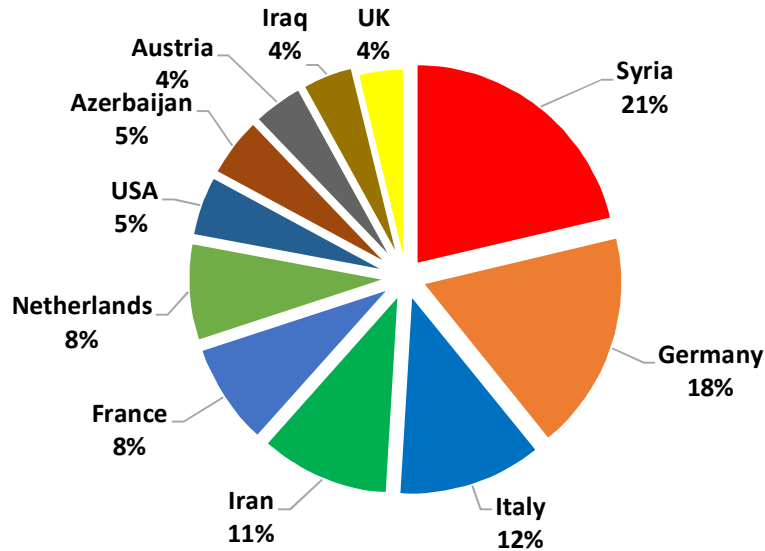
Syria shares 14% of total foreign capital venture companies while Germany shares 12%, Italy 8% in and Iran 7%. French and Dutch companies have a share of 6% in total.

Countries	Number of Companies
Syria	56
Germany	47
Italy	31
Iran	28
France	22
Netherlands	21
USA	13
Azerbaijan	13
Austria	11
Iraq	11
UK	10
Others	126
Total	389

Table 5: Foreign Capital Venture Companies in Plastics Industry by Counties

Source: Ministry of Economics

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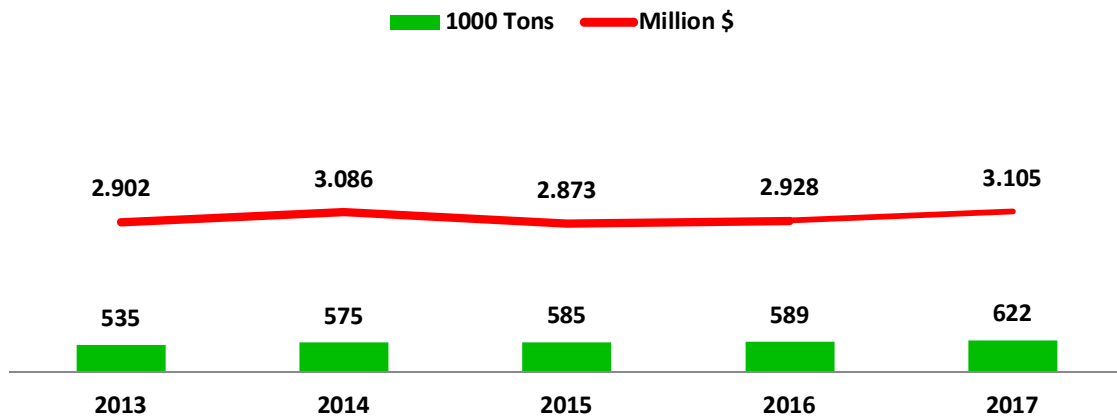
Graphic 7: Foreign Capital Venture Companies in Plastics Industry by Countries

Source: Ministry of Economics

2.6. FOREIGN TRADE

2.6.1. IMPORTS

In 2017, 622 thousand tons and 3 billion 105 million dollars of plastic end products were imported. Imports of plastics end products. In 2017, imports of plastic products increased by 5.6% on amount and by 6% in value terms compared to 2016.



Graphic 8: Plastics End Products Imports

Source: Turk Stat & ITC Trade Statistics

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By the end of 2017, the highest imports by amount and value basis were realized in the end product group of 3920 HS Code (other plates, sheets, pellets, foils and slides from plastic). The imports of this group accounted for 44% on amount and 32% on value basis of total imports.

HS CODE	Description	2016	2017	% Increase 2017/2016
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	14	13	-6.7
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	26	28	5.4
3918	Floor coverings from plastic – incl. wall and ceiling coverings	22	24	9.0
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	58	61	6.4
3920	Other plate, sheet, pellicles and slides from plastic	249	271	9.0
3921	Other plates, sheets, pellicles, foils and slides from plastic	64	70	9.7
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	4	5	1.4
3923	Plastic products for moving furniture, tap, cap, capsule	61	63	4.4
3924	Table, kitchen and other household furniture, toiletry form plastic	11	9	-14.4
3925	Construction materials from plastic	10	9	-9.5
3926	Other goods from plastic	71	68	-3.3
	TOTAL	589	622	5.6

Table 6: Plastics End Products Imports by HS Codes (1000 Ton)

Source: Turk Stat & ITC Trade Statistics

HS CODE	Description	2016	2017	% Increase 2017/2016
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	57	57	0.7
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	209	238	13.8
3918	Floor coverings from plastic – incl. wall and ceiling coverings	89	88	-0.6
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	331	341	3.0
3920	Other plate, sheet, pellicles and slides from plastic	907	999	10.1
3921	Other plates, sheets, pellicles, foils and slides from plastic	250	270	8.0
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	42	42	2.1
3923	Plastic products for moving furniture, tap, cap, capsule	269	284	5.7
3924	Table, kitchen and other household furniture, toiletry form plastic	68	60	-11.9
3925	Construction materials from plastic	39	41	5.0
3926	Other goods from plastic	668	684	2.4
	TOTAL	2,928	3,105	6.0

Table 7: Plastics End Products Imports by HS Codes (Million \$)

Source: Turk Stat & ITC Trade Statistics

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**2.6.2. IMPORTS BY COUNTRIES**

Every year, Turkey imports plastic end products from more than 100 countries. By the end of 2017, imports from 10 countries accounted for 69% of the total imports on amount and 73% on value basis.

Since 2014, China has been the 1st biggest import partner of Turkey in plastics end products imports. By 2017, China's total imports of plastic products accounted for 26% on amount and 19% on a value basis.

Apart from China, Germany, Italy, South Korea and France seem to have preserved the position of the countries in which we import the largest plastic products.

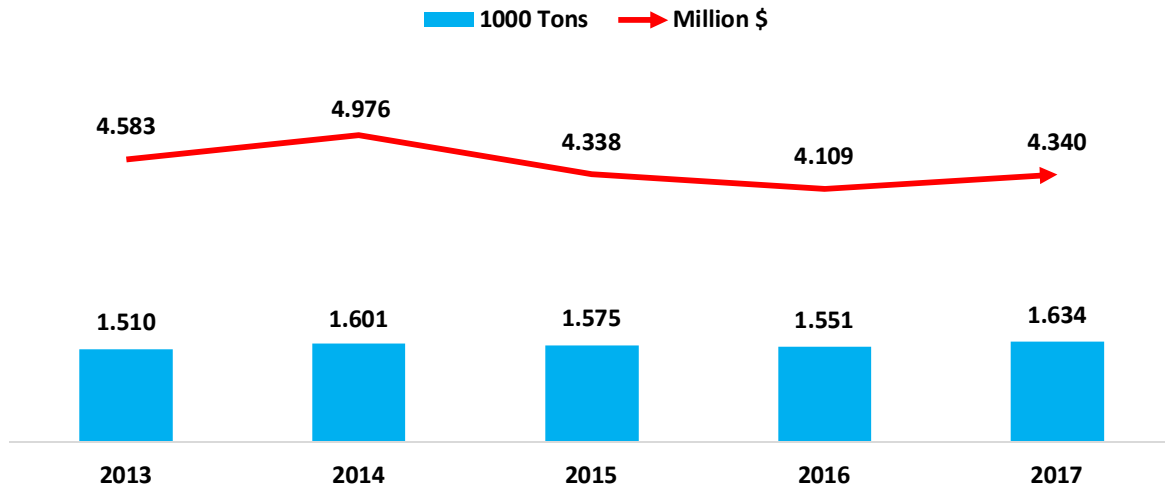
2016					2017				
Countries	1000 Tons	Million \$	Ton - %	\$ - %	Countries	1000 Tons	Million \$	Ton - %	\$ - %
China	157	602	26.6	20.6	China	162	604	25.5	19.1
Germany	94	547	15.9	18.7	Germany	93	558	14.6	17.7
Italy	52	252	8.7	8.6	Italy	54	273	8.5	8.7
S. Korea	35	212	5.9	7.2	S. Korea	40	230	6.3	7.3
France	28	185	4.8	6.3	France	28	186	4.3	5.9
USA	13	128	2.2	4.4	USA	13	127	2.0	4.0
UK	12	96	2.1	3.3	UK	15	109	2.4	3.4
Belgium	15	70	2.5	2.4	Belgium	17	78	2.7	2.5
Japan	5	66	0.9	2.2	Spain	14	75	2.1	2.4
Spain	11	60	1.9	2.0	Japan	6	70	0.9	2.2
10 Countries	422	2,219	71.6	75.8	10 Countries	441	2,310	69.3	73.2
Others	168	710	28.4	24.2	Others	196	847	30.7	26.8
TOTAL	589	2,928	100.0	100.0	TOTAL	637	3,157	100.0	100.0

Table 8: Plastics End Products Imports by the Main 10 Countries

2.6.3. EXPORTS

As of 2017, 1 million 634 thousand tons and 4 billion 340 million dollars of plastic end products were exported. Plastics end products exports increased by 5.4% on amount and 5.6% in value terms in 2017 with respect to 2016.

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Graphic 9: Plastics End Products Exports

Source: Turk Stat & ITC Trade Statistics

As of 2017, the largest exports in terms of quantity and value were 3920 HS group (other plates, sheets, pellicles and slides from plastic) and 3923 HS group (plastics products, containers, caps, capsules for goods transport packaging). The total exports of plastic products of these groups are 46% in volume and 43% in value basis.

HS CODE	Description	2016	2017	% Increase 2017/2016
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	146	162	10.7
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	215	211	-1.7
3918	Floor coverings from plastic – incl. wall and ceiling coverings	13	13	-5.5
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	20	20	1.0
3920	Other plate, sheet, pellicles and slides from plastic	369	384	3.9
3921	Other plates, sheets, pellicles, foils and slides from plastic	140	146	4.2
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	24	26	7.1
3923	Plastic products for moving furniture, tap, cap, capsule	335	366	9.3
3924	Table, kitchen and other household furniture, toiletry form plastic	121	142	16.8
3925	Construction materials from plastic	94	86	-8.9
3926	Other goods from plastic	74	80	9.1
	TOTAL	1.551	1.634	5.4

Table 9: Exports of Plastics End Products by HS Codes (1000 Ton)

Source: Turk Stat & ITC Trade Statistics

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HS CODE	Description	2016	2017	% Increase 2017/2016
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	250	269	7.6
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	553	523	-5.4
3918	Floor coverings from plastic – incl. wall and ceiling coverings	26	27	4.9
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	113	99	-12.5
3920	Other plate, sheet, pellicles and slides from plastic	923	976	5.7
3921	Other plates, sheets, pellicles, foils and slides from plastic	402	416	3.5
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	100	104	4.2
3923	Plastic products for moving furniture, tap, cap, capsule	809	890	10.0
3924	Table, kitchen and other household furniture, toiletry form plastic	356	399	12.1
3925	Construction materials from plastic	217	219	0.7
3926	Other goods from plastic	359	418	16.4
	TOTAL	4,109	4,340	5.6

Table 10: Exports of Plastics End Products by HS Codes (Million \$)

Source: Turk Stat & ITC Trade Statistics

2.6.4. EXPORTS BY COUNTRIES

Turkey exports plastic end products to about 150 countries. As of 2017, 10 countries had 47% share on amount and 45% on value basis in total exports.

As of 2017, Iraq, Germany, UK, Israel and France had the biggest share in total plastics end product exports.

2016					2017				
Countries	1000 Tons	Million \$	Ton - %	\$ - %	Countries	1000 Tons	Million \$	Ton - %	\$ - %
Iraq	199	373	12.8	9.1	Iraq	222	404	13.6	9.3
Germany	87	299	5.6	7.3	Germany	85	310	5.2	7.1
UK	78	197	5.1	4.8	UK	78	206	4.8	4.7
France	52	168	3.4	4.1	Israel	89	198	5.4	4.6
Israel	74	167	4.8	4.1	France	51	166	3.1	3.8
Romaine	54	142	3.5	3.4	Romain	55	149	3.4	3.4
Italy	52	136	3.4	3.3	Bulgaria	46	148	2.8	3.4
Iran	43	132	2.7	3.2	Italy	54	143	3.3	3.3
Bulgaria	44	126	2.8	3.1	Georgia	51	111	3.1	2.6
Georgia	46	103	3.0	2.5	Iran	34	110	2.1	2.5
10 Countries	729	1.842	47.0	44.8	10 Countries	766	1,944	46.9	44.8
Others	821	2.267	53.0	55.2	Others	868	2,396	53.1	55.2
TOTAL	1,551	4,109	100.0	100.0	TOTAL	1,634	4,340	100.0	100.0

Table 11: Plastics End Products Exports by the Main 10 Countries

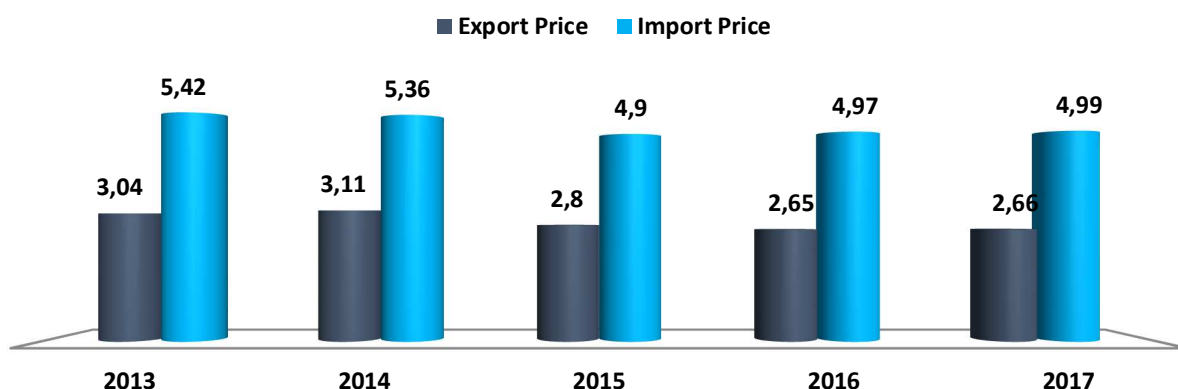
Source: Turk Stat & ITC Trade Statistics

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2.6.5. IMPORT AND EXPORT PRICES

Unit import prices for plastic end products are always above the unit export prices.



Graphic 10: Average Unit Foreign Trade Prices for Plastics End Products

Source: Turk Stat & ITC Trade Statistics

As of 2017, the average import prices of plastic end products were \$ 4.99/kg and the average export prices were \$ 2.66/kg. In this period, average import price increased 0.5% and the average export price increased 0.2% with respect to 2016.

HS CODE	PLASTIC PRODUCTS DEFINITIONS	Import Prices			Export Prices		
		2016	2017	% Increase	2016	2017	% Increase
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	4,13	4,46	8.0	1,72	1,67	-2.8
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	7,97	8,60	8.0	2,57	2,48	-3.7
3918	Floor coverings from plastic – incl. wall and ceiling coverings	3,97	3,62	-8.8	1,94	2,15	11.0
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	5,75	5,57	-3.2	5,79	5,01	-13.4
3920	Other plate, sheet, pellicles and slides from plastic	3,64	3,68	1.0	2,50	2,54	1.8
3921	Other plates, sheets, pellicles, foils and slides from plastic	3,92	3,85	-1.6	2,87	2,85	-0.7
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	9,26	9,33	0.7	4,16	4,05	-2.7
3923	Plastic products for moving furniture, tap, cap, capsule	4,43	4,48	1.3	2,42	2,43	0.6
3924	Table, kitchen and other household furniture, toiletry form plastic	6,43	6,62	2.9	2,94	2,82	-4.1

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3925	Construction materials from plastic	3,78	4,39	16.0	2,30	2,55	10.5
3926	Other goods from plastic	9,45	10,00	5.9	4,89	5,21	6.7
	Average	4,97	4,99	0.5	2,65	2,66	0.2

Table 12: Average Unit Foreign Trade Prices for Plastics End Products (USD/kg)

Source: Turk Stat & ITC Trade Statistics

2.6.6. VALUE ADDED CREATED IN EXPORTS

As of 2017, an added value of \$ 1.2 per kg was created in exports of plastic end products industry. The highest added value to the export price was provided by products of 3919 with 72%. However, the share of 3919 HS products in total exports is only 2%.

In order to increase the added value of exports in the plastic industry, it is necessary to increase the share of high added value products in total exports.

HS Code	Value Added By kg (\$/kg)	Value Added/Export Price (%)	Share in Total Industry Exports (%)	Share in Total Industry Imports (%)	Share in Total Domestic Consumption (%)	HS Code
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	0.2	15	6	2	4
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	1.1	43	12	8	10
3918	Floor coverings from plastic – incl. wall and ceiling coverings	0.7	34	1	3	2
3919	adhesive plate, sheet, strip, slide, etc. from plastic; flat	3.6	72	2	11	7
3920	Other plate, sheet, pellicles and slides from plastic	1.1	44	22	32	27
3921	Other plates, sheets, pellicles, foils and slides from plastic	1.4	50	10	9	9
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	2.6	65	2	1	2
3923	Plastic products for moving furniture, tap, cap, capsule	1.0	42	21	9	15
3924	Table, kitchen and other household furniture, toiletry form plastic	1.4	50	9	2	6
3925	Construction materials from plastic	1.1	44	5	1	3
3926	Other goods from plastic	3.8	73	10	22	16
	Average	1.2	47	100	100	100

Table 13: Value Added Created by Plastics Exports (2017)

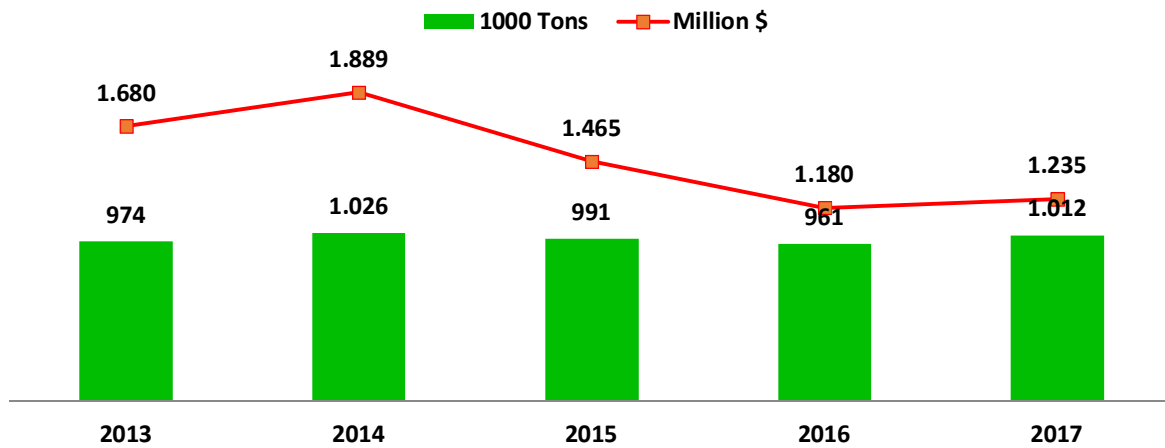
Source: Turk Stat & ITC Trade Statistics

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2.6.7. FOREIGN TRADE SURPLUS

Turkey always gives foreign trade surplus in plastic end products foreign trade. As of 2017, 1 million 12 thousand tons and 81 billion 24 million dollars of foreign trade surplus were obtained. Foreign trade surplus increased by 5,3 on amount and 4,7% in terms of value in 2017 with respect to 2016.

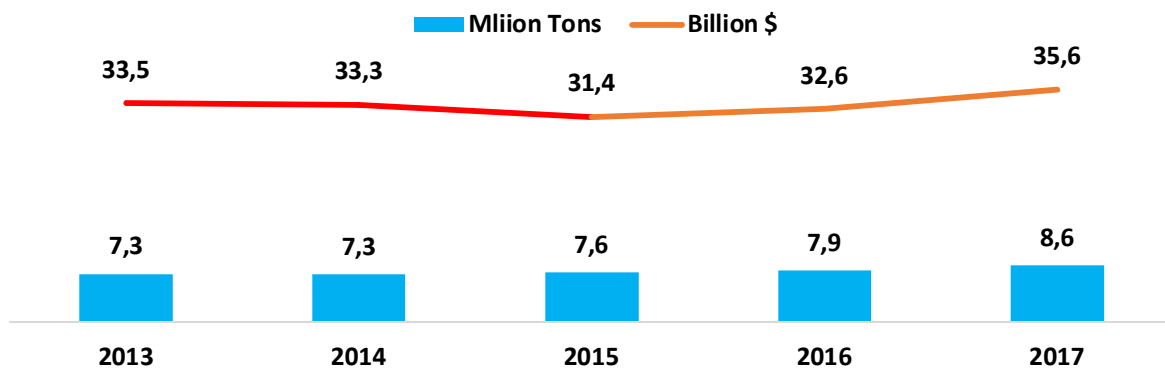


Graphic 11: Foreign Trade Surplus of Plastics End Products

Source: Turk Stat & ITC Trade Statistics

2.7. DOMESTIC CONSUMPTION

As of 2017, domestic consumption of 8.6 million tons and \$ 35.6 billion was realized in the plastic end products industry. Domestic consumption of plastics end products increased by 8.9% on amount base and 9.2% in terms of value in 2017 with respect to 2016.



Graphic 12: Plastics End Products Domestic Consumption

Source: Turk Stat & ITC Trade Statistics

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As of 2017, approximately 4 million 300 thousand tons of domestic consumption has been exported indirectly by the exporting industries channels such as automotive, packaging, construction and electronics as finished and semi-finished products. The remaining 4 million 300 thousand tons were consumed directly by the consumer.

2.8. SUPPLY AND DEMAND AND EXPECTATIONS FOR 2018

Considering the of 2017 on **amount basis**;

Production increased by 8.5% while imports by 5.6% exports by 5.4% domestic consumption by 8,9% and foreign trade surplus by 5.3%.

- ✓ In 2017, the share of exports in production realized as 17%, the share of imports in domestic consumption 7% while imports coverage ratio of exports stayed at the same level of 263%
- ✓ The annual rate of increase in quantity over the last 5 years covering 2013 - 2017; 3.7% in production, 3.8% in exports, 2% in exports, 4.1% in domestic consumption and 0.9% in foreign trade surplus.

It is expected that by 2018 with respect to 2017; production of plastic end products will increase by 5% increasing to 10.1 million tons, 653 thousand tons of plastic end products will be imported, 1.7 million tons of plastics end product will be exported, domestic consumption will exceed 9 million tons and 1 million 62 thousand tons of foreign trade surplus will be realized.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	8,318	8,867	9,624	8.5	3.7	10,105
Imports	535	589	622	5.6	3.8	653
Exports	1,510	1,551	1,634	5.4	2.0	1,716
Domestic Consumption	7,344	7,905	8,612	8.9	4.1	9,043
Foreign Trade Surplus	974	961	1,012	5.3	0.9	1,062
Exports/Production (%)	18	17	17			17
Imports/Domestic Consumption (%)	7	7	7			7
Exports/Imports (%)	282	263	263			263

Table 14: Supply and Demand Equilibrium in Plastics End Products (1000 Ton)

Source: Turk Stat & ITC Trade Statistics

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Considering the of 2017 on **value basis**;

Production increased by 9% while imports by 6% exports by 5.6% domestic consumption by 9.1% and foreign trade surplus by 4.6%.

- ✓ In 2017, the share of exports in production realized as 12%, the share of imports in domestic consumption 9% while imports coverage ratio of exports stayed at the same level of 140%
- ✓ The annual rate of increase in quantity over the last 5 years covering 2013 - 2017; 1.1% in production, 1.7% in imports, 1.5% in domestic consumption while exports declined by 1.4% and foreign trade surplus decreased by 7.4%

It is expected that by 2018 with respect to 2017; production of plastic end products will increase to 38.6 billion dollars and 3.26 billion dollars of imports, 4.6 billion dollars of exports will be realized. In 2018 foreign trade surplus is expected to be 1.3 billion dollars and domestic sales including indirect exports by 37.4 billion dollars.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013-2017	2018/E
Production	35,182	33,770	36,793	9.0	1.1	38,633
Imports	2,902	2,928	3,105	6.0	1.7	3,260
Exports	4,583	4,109	4,340	5.6	-1.4	4,557
Domestic Consumption	33,502	32,590	35,558	9.1	1.5	37,336
Foreign Trade Surplus	1,680	1,180	1,235	4.6	-7.4	1,297
Exports/Production (%)	13	12	12			12
Imports/Domestic Consumption (%)	9	9	9			9
Exports/Imports (%)	158	140	140			140

Table 15: Supply and Demand Equilibrium in Plastics End Products (Million \$)

Source: Turk Stat & ITC Trade Statistics

3. PLASTICS RAW MATERIALS INDUSTRY

3.1. PRODUCTION

As of 2017, total plastic raw material production is estimated to be around 1 million 14 thousand tons.

	1000 Tons
LDPE	314
HDPE	90

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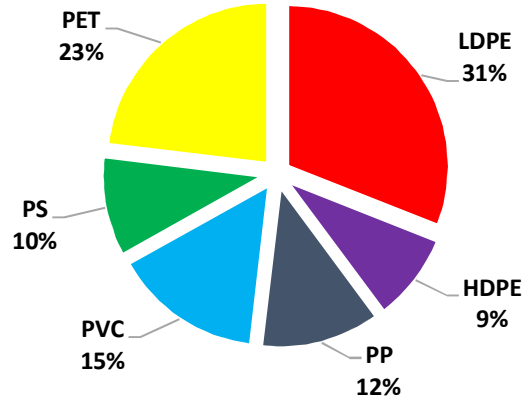


PE	404
PP	122
PVC	152
PS	102
PET	234
Total	1,014

Table 16: Plastics Raw Materials Production (2017)

Source: PETKİM and Other Producers

As of 2017, 31% of the total plastic raw materials was LDPE 9% was HDPE, 15% was PVC, 12% was PP, 10% was PS and 23% was PET.



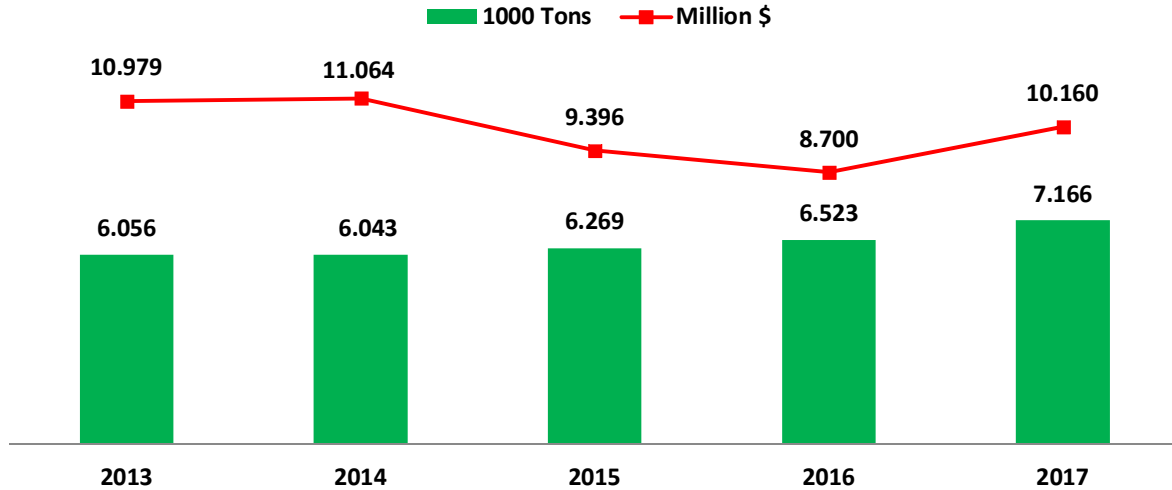
Graphic 13: Plastics Raw Materials Production (2017)

Source: PETKİM and Other Producers

3.2. FOREIGN TRADE

3.2.1. IMPORTS

Imports of plastic raw materials increased by 16.9% on amount and by 9.9% in value bases in 2017 compared to 2016 and realized as 7 million 166 thousand tons and 10.16 billion dollars.



Graphic 14: Plastics Raw Materials Imports

Source: Turk Stat & ITC Trade Statistics

The highest imports on amount basis were polyethylene and polypropylene. The imports of these two raw materials have received a 55% share of total plastic raw material imports on amount basis.

HS Code	Description	2016	2017	% Increase 2017/2016
3901	Ethylene polymers (initial forms)	1,710	1,814	6.1
3902	Propylene and polymers of other olefins (initial forms)	2,021	2,136	5.7
3903	Styrene polymers (initial forms)	509	535	5.1
3904	Other olefin polymers with vinyl chloride/homogenous	758	860	13.4
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	45	47	4.5
3906	Acrylic polymers (initial forms)	208	224	7.9
3907	Polyacetals, other polyethers, epoxide-alkyd resins (initial forms)	688	829	20.5
3908	Polyamides (initial forms)	94	100	6.0
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	218	235	8.1
3910	Silicones (initial forms)	32	37	15.3
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	33	34	5.7
3912	Cellulose and chemical derivatives (initial form)	39	43	10.3
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	4	3	-14.0
3914	Polymer based ion exchangers (initial form)	5	7	26.9
3915	Wastes, residuals and scraps from plastic	160	262	64.1
	Total	6,523	7,166	9.9

Table 17: Plastics Raw Materials Imports by HS Codes (1000 Ton)

Source: Turk Stat & ITC Trade Statistics

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On the other hand, it is observed that polyethylene and polypropylene were the highest imports in value terms in the same period. The imports of these two raw materials have received a 51% share of total plastic raw material import value.

HS Code	Description	2016	2017	% Increase 2017/2016
3901	Ethylene polymers (initial forms)	2,282	2,442	4.3
3902	Propylene and polymers of other olefins (initial forms)	2,529	2,722	16.0
3903	Styrene polymers (initial forms)	814	881	26.1
3904	Other olefin polymers with vinyl chloride/homogenous	821	903	28.1
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	103	111	4.9
3906	Acrylic polymers (initial forms)	336	364	20.6
3907	Polyacetals, other polyethers, epoxide-alkyd resins (initial forms)	1,285	1,400	23.4
3908	Polyamides (initial forms)	242	267	24.9
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	509	554	34.9
3910	Silicones (initial forms)	128	141	20.9
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	89	97	7.0
3912	Cellulose and chemical derivatives (initial form)	151	164	10.3
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	20	22	-6.9
3914	Polymer based ion exchangers (initial form)	15	16	17.3
3915	Wastes, residuals and scraps from plastic	67	76	53.8
	Total	9,393	10,160	16.8

Table 18: Plastics Raw Materials Imports by HS Codes (Million \$)

Source: Turk Stat & ITC Trade Statistics

It is observed that the high import dependence of the Turkish plastics industry in the supply of plastic raw materials is on the rise and that imports account for 88% of the total supply.

3.2.2. IMPORTS BY COUNTRIES

Turkey imports plastic raw materials from more than 100 countries. In 2017, 10 countries shared 63% of the total imports on amount and 65% of it in terms of value.

In 2017, total imports of plastic raw materials had the first three orders from S. Arabia, S. Korea and Germany and the share of these three countries in total plastic raw material imports is around 33%.

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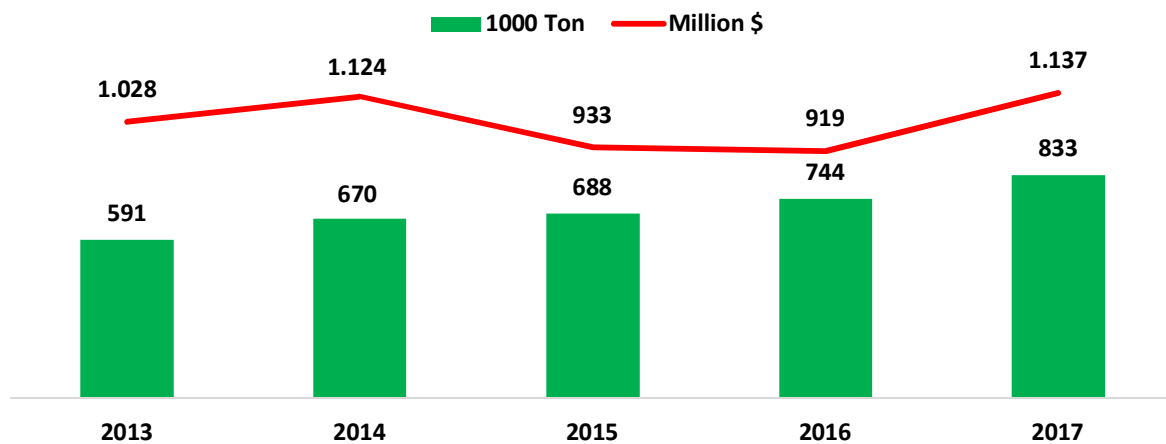
2016					2017				
COUNTRIES	1000 Tons	Million \$	Ton - %	\$ - %	COUNTRIES	1000 Tons	Million \$	Ton - %	\$ - %
S. Arabia	1,064	1,226	16,3	14,1	S. Arabia	1,133	1,368	15.8	13.5
S. Korea	646	865	9,9	9,9	S. Korea	666	995	9.3	9.8
Germany	429	853	6,6	9,8	Germany	488	973	6.8	9.6
Belgium	385	552	5,9	6,3	Belgium	419	664	5.8	6.5
Italy	237	410	3,6	4,7	Iran	417	485	5.8	4.8
Iran	361	400	5,5	4,6	France	317	457	4.4	4.5
France	300	386	4,6	4,4	Italy	245	452	3.4	4.5
Netherlands	228	370	3,5	4,3	Netherlands	245	428	3.4	4.2
Spain	265	370	4,1	4,3	Spain	273	422	3.8	4.1
Egypt	269	290	4,1	3,3	Egypt	311	373	4.3	3.7
10 Countries	4,184	5,724	64,1	65,8	10 Countries	4,514	6,616	63.0	65.1
Others	2,338	2,976	35,9	34,2	Others	2,652	3,544	37.0	34.9
Total	6,523	8,700	100,0	100,0	Total	7,166	10,160	100.0	100.0

Table 19: Plastics Raw Materials Imports by Countries

Source: Turk Stat & ITC Trade Statistics

3.2.3. EXPORTS

Exports of plastic raw materials in 2017 increased by 11.9% on amount and by 23.7% on value basis compared to 2016 and realized as 83 thousand tons and 1 billion 137 million dollars.



Graphic 15: Plastics Raw Materials Exports

Source: Turk Stat & ITC Trade Statistics

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In 2017, the largest exports on amount and value basis were realized in polyesters and acrylic polymers.

HS Code	Description	2016	2017	% Increase 2017/2016
3901	Ethylene polymers (initial forms)	72	117	62.0
3902	Propylene and polymers of other olefins (initial forms)	26	27	5.3
3903	Styrene polymers (initial forms)	26	31	18.6
3904	Other olefin polymers with vinyl chloride/homogenous	20	19	-3.0
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	52	53	2.2
3906	Acrylic polymers (initial forms)	174	180	3.5
3907	Polyacetals, other polyethers, epoxide-alkyd resins (initial forms)	216	242	12.1
3908	Polyamides (initial forms)	14	15	10.4
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	80	82	2.3
3910	Silicones (initial forms)	6	6	-2.1
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	1	1	72.4
3912	Cellulose and chemical derivatives (initial form)	40	42	7.0
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	0	0	-9.9
3914	Polymer based ion exchangers (initial form)	0	0	-18.2
3915	Wastes, residuals and scraps from plastic	17	15	-10.0
	Total	744	833	11.9

Table 20: Plastics Raw Materials Exports by HS Codes (1000 Ton)

Source: Turk Stat & ITC Trade Statistics

HS Code	Description	2016	2017	% Increase 2017/2016
3901	Ethylene polymers (initial forms)	95	150	57.4
3902	Propylene and polymers of other olefins (initial forms)	32	35	7.7
3903	Styrene polymers (initial forms)	30	43	42.8
3904	Other olefin polymers with vinyl chloride/homogenous	21	21	0.8
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	42	42	0.4
3906	Acrylic polymers (initial forms)	186	208	12.1
3907	Polyacetals, other polyethers, epoxide-alkyd resins (initial forms)	322	398	23.6
3908	Polyamides (initial forms)	24	30	26.6
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	86	120	40.2
3910	Silicones (initial forms)	22	20	-9.5
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	2	4	58.0
3912	Cellulose and chemical derivatives (initial form)	43	47	10.0
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	1	1	2.8

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3914	Polymer based ion exchangers (initial form)	1	1	11.8
3915	Wastes, residuals and scraps from plastic	13	17	31.9
	Total	919	1.137	23.7

Table 21: Plastics Raw Materials Exports by HS Codes (Million \$)

Source: Turk Stat & ITC Trade Statistics

3.2.4. EXPORTS BY COUNTRIES

Turkey is exporting plastic raw materials to more than 100 countries and 10 countries have received 46% share of total exports in terms of amount and 47% on value basis in 2017, In 2017, Germany, Italy, Egypt, Iran, and the Russian Federation were the top five export partners of Turkey,

2016					2017				
Countries	1000 Tons	Million \$	% - Ton	% - \$	Countries	1000 Tons	Million \$	% - Ton	% - \$
Germany	65	86	8.7	9.4	Germany	68	102	7.6	8.4
Italy	59	74	7.9	8.0	Italy	76	95	8.4	7.9
Egypt	56	54	7.5	5.9	Egypt	56	61	6.2	5.0
Iran	25	50	3.4	5.4	Iran	26	59	2.9	4.9
Russian Fed,	19	37	2.6	4.1	Russian Fed,	25	51	2.8	4.2
Bulgaria	45	34	6.1	3.7	Bulgaria	48	51	5.4	4.2
Israel	29	30	3.9	3.2	Spain	30	39	3.3	3.2
Iraq	22	29	2.9	3.1	Iraq	25	37	2.8	3.1
Greece	38	28	5.1	3.0	Israel	33	36	3.6	3.0
Spain	23	26	3.1	2.8	Romain	26	34	2.9	2.8
10 Countries	381	448	51.1	48.7	10 Countries	413	566	46.0	46.5
Others	363	471	48.9	51.3	Others	486	649	54.0	53.5
Total	744	919	100.0	100.0	Total	898	1,215	100.0	100.0

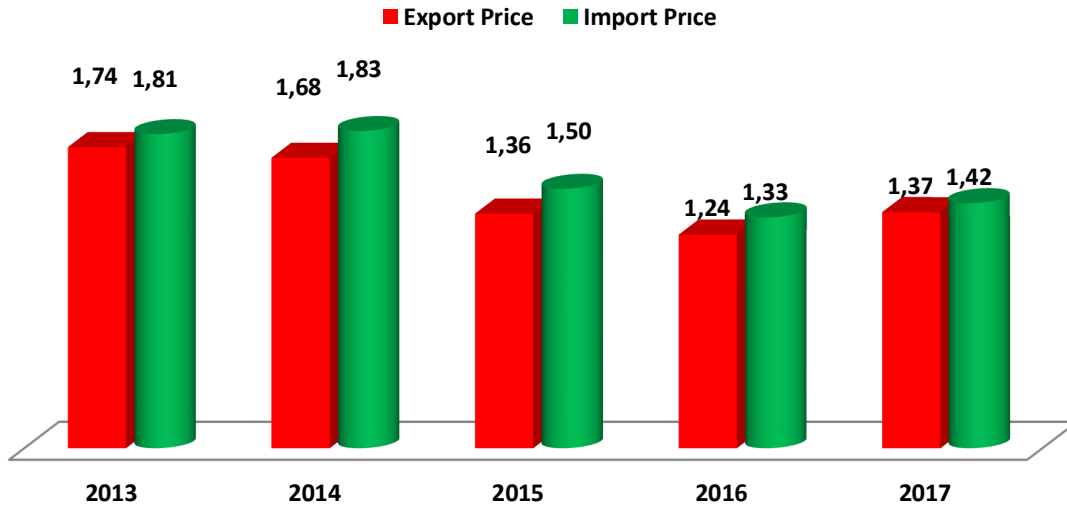
Table 22: Plastics Raw Materials Exports by Countries

Source: Turk Stat & ITC Trade Statistics

3.2.5. IMPORT AND EXPORT PRICES

As of the end of 2017, the average unit import price of plastic raw materials was 1.412 \$/kg and the average unit export price was 1.37 \$/kg, The import price increased by 6.3% and export price by 10.5% in 2017 compared to 2016.

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Graphic 16: Plastics Raw Materials Average Foreign Trade Prices (\$/kg)

Source: Turk Stat & ITC Trade Statistics

HS Code No	Import Price			Export Price		
	2016	2017	% Increase	2016	2017	% Increase
3901	1,37	1,35	-1.7	1,32	1,28	-2.9
3902	1,16	1,27	9.8	1,27	1,30	2.3
3903	1,37	1,65	20.0	1,15	1,39	20.4
3904	0,93	1,05	12.9	1,06	1,10	3.9
3905	2,35	2,36	0.4	0,80	0,79	-1.7
3906	1,45	1,62	11.7	1,07	1,16	8.4
3907	1,65	1,69	2.4	1,49	1,64	10.2
3908	2,26	2,66	17.8	1,72	1,98	14.6
3909	1,89	2,36	24.8	1,07	1,47	37.0
3910	3,69	3,87	4.9	3,46	3,20	-7.6
3911	2,79	2,82	1.2	3,08	2,82	-8.3
3912	3,82	3,82	0.0	1,09	1,12	2.7
3913	6,22	6,74	8.3	5,31	6,05	14.0
3914	2,49	2,30	-7.6	3,20	4,37	36.6
3915	0,31	0,29	-6.3	0,75	1,10	46.5
Average	1,33	1,42	6.3	1,24	1,37	10.5

Table 23: Plastics Raw Materials Average Import and Exports Prices by HS Codes (USD/kg)

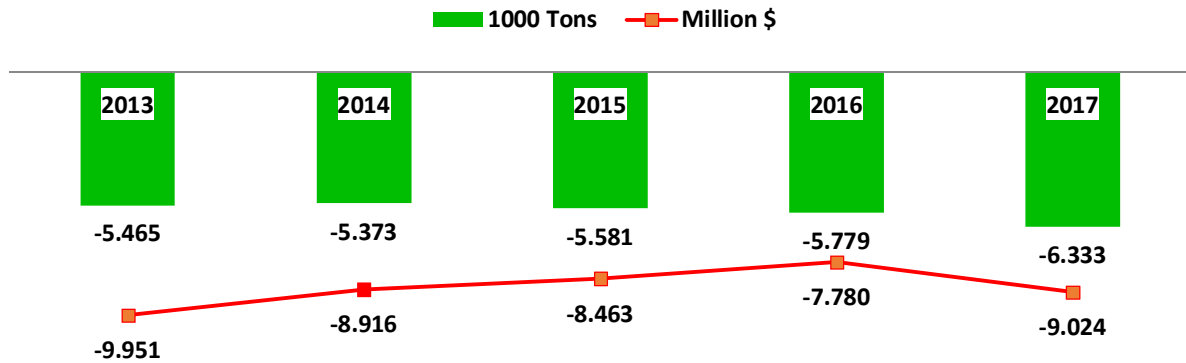
Source: Turk Stat & ITC Trade Statistics

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3.2.6. FOREIGN TRADE DEFICIT

Turkey is a country that gives deficit in plastics raw materials foreign trade. The plastic raw materials foreign trade deficit realized as 6 million 303 thousand tons and 9.24 billion dollars in 2017.

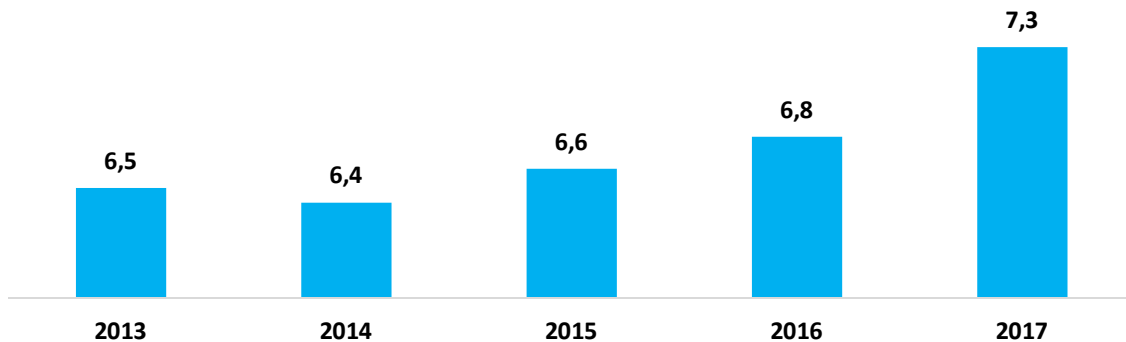


Graphic 17: Plastics Raw Materials Foreign Trade Deficit

Source: Turk Stat & ITC Trade Statistics

3.3. DOMESTIC CONSUMPTION

In 2017, domestic consumption of plastic raw materials was 7.3 million tons and increased by 7.3% compared to 2016.



Graphic 18: Plastics Raw Materials Domestic Consumption (Million Ton)

Source: Turk Stat & ITC Trade Statistics

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3.4. SUPPLY AND DEMAND EQUILIBRIUM AND 2018 ESTIMATES

In the last five years from 2013 to 2017, while plastic raw material production remained at the same levels, imports increased on average annually by 4.3%, exports by 8.9%, domestic consumption by 3.2% and foreign trade deficit by 3.8%.

In 2017 compared to 2016, imports increased by 9.9%, exports by 11.9% domestic consumption and foreign trade deficit by 9.6% respectively.

In parallel with the expected increase in the plastic end products industry in 2018, it is estimated that imports in the plastic raw material industry will reach to 7.5 million tons, exports to 874 thousand tons and domestic consumption to 7.6 million tons. It is expected that in 2018 the share of exports in production will increase by 86% and the share of imports in total supply to 88%.

	2013	2016	2017	% Increase 2017/2016	CAGR % 2013- 2017	2018/E
Production	1,014	1,014	1,014	0.0	0.0	1.014
Imports	6,056	6,523	7,166	9.9	4.3	7.524
Exports	591	744	833	11.9	8.9	874
Domestic Consumption	6,479	6,793	7,347	8.2	3.2	7.664
Foreign Trade Surplus	-5,465	-5,779	-6,333	9.6	3.8	-6.650
Exports/Production (%)	58	73	82			86
Imports/Domestic Consumption (%)	86	87	88			88
Exports/Imports (%)	10	11	12			12

Table 24: Supply and Demand Equilibrium in Plastics Raw Materials (1000 Tons)

Source: Turk Stat & ITC Trade Statistics

4. POTENTIAL INVESTMENT AREAS

Turkey, while importing added value of large plastic products is transferring abroad by exporting low value-added products.

Foreign capital investments should be withdrawn to the future technology fields that arise in the work of Vision 2023 prepared by TUBITAK in order to produce and export high value added products.

These areas are; Laser welding, water injection technology, laser melting process in injection molding machines, thin wall injection technology, mold flow process simulation software, EPDM production instead of PVC, polymer synthesis, original, new and functional polymer design and

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synthesis, nanotechnology - Nano-polymer automation, machinery, electrical sectors, advanced technology in the fields of automation, machinery, electrical, electric power injection systems, multi-color injection systems, multi-material injection systems, effective cooling technologies, breaking and reuse technologies, cycle time reduction systems, saving injection machines, applications, application of functional polymers in the defense industry, advanced functional polymeric resin development and applications originally designed for composite material technology, in mold decoration, twin sheet thermoforming technology, rapid mold design and production, hot runner technologies , the use of blowing agents (material saving), the ability to test, analyze, identify and standardize polymers, the use of functional, unique advanced polymer technology in textile.

Other investment areas are; mold design, plastic recycling infrastructure investments, shifting the plastic products manufacturing facilities to Turkey, the growth rate of which are declining EU countries and to meet the needs of EU countries by producing in Turkey, replacement of old machineries of the plastics industry accounting by 35% - 40% of machinery park with new machines to save energy, producing smart packs and modified packages.

Potential areas of investments in the plastics industry that will reduce import dependency of raw materials and produce high value added products are: PP, PVC, LDPE, HDPE, PS, PET, PTA, MEG, ACN, SBR, CARBON BLACK, ABS, PA, ETHYL HEXANOL, LAB, TDI CBR, POLYCARBONATES, PROPYLENE GLYCOL, MALEIC ANHYDRIDE, ISO-PROPANOL, ACRYLIC ACID, ACRYLATES, POLYETHER ALCOHOLS (POLYOL).

5. CONCLUSIONS

Turkish plastics industry is growing rapidly and having greater share in global plastics industry, The 2023 export vision of the industry is to realize at least \$ 17 billion of the export goal of \$ 50 billion targeted for the chemical sector, It is extremely difficult to reach 17 billion dollars of exports in the current situation, As a matter of fact, apart from solving the increasing problems parallel to the growth of the sector, it is necessary to take measures to increase unit export prices which is below \$ 3/kg to the developed countries average of 4.5 \$/kg as well as to maximize the investment incentives is required,

The most important problem of the Turkish plastics industry which is the high tax problem of in importing raw materials, has not changed in the 10th Development Plan. The important thing is to produce high value added raw materials in Turkey. Taxes that we pay when importing raw materials purchased by everyone, such as polypropylene and polyethylene that the sector can not meet the domestic demand, negatively affect our competition. It is known that when we

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eliminate these negativities, the added value that our industry provides to the Turkish economy will increase even more,

The basic industrial vision of the plastics industry is "to bring the plastics industry to the first place in the European countries with the plastic processing capacity as a leading industry which is producing technology accepted by global markets, in 2023".

However, the requirements for the realization of this vision are summarized below;

- a. Stable and sustainable economic growth,
- b. The preparation of a special strategic plan for the plastics industry and the provision of the government as a vision,
- c. Ensure that foreign capital invests directly in plastic raw materials and high value added products, with attractive investment incentives,
- d. Refinery - petrochemical integration,
- e. Giving importance and incentive to R&D and P&D studies to produce high value added products, increasing the average export price from 3 \$ / kg to at least 4.5 \$ / kg,
- f. Gaining competitive advantage in global markets by saving cost without sacrificing quality,
- g. Solution of the problem of qualified staff,
- h. Strengthening the recycling infrastructure,

The basic strategic objectives and policies of the industry for the realization of this vision are as follows;

- ✓ Reduction of import dependency on raw materials,
- ✓ Investing in technologies that will be dominant in the future in order to increase the added value,
Increasing competition,
- ✓ Improving the educational infrastructure of the sector,
- ✓ Establishment of economic infrastructure for the development of the industry and attracting foreign capital investments,

Only 389 (6%) of the 6500 firms operating in the plastics industry have foreign capital partnerships, which indicates that foreign capital investments in the plastics industry are low, However, the plastics industry is a potential investment area in terms of foreign direct investment,

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Turkey's current production capacity of plastic raw materials are sufficient to cover less than 15% of the sector's needs. When the growth rate of the industry is taken into consideration, in 2023, over 10 million tons of plastic raw material will be revealed. In order to attract foreign capital to these areas, petrochemical investments should be included in the scope of private incentive by the state and should be considered as a project to be specially encouraged with big investment incentives.

The most important problem of the Turkish plastics industry which is the high tax in importing raw materials, has not changed in 2017. It is important to produce high value-added raw materials in Turkey. When we import the raw materials such as polypropylene and polyethylene, which we can not meet the domestic needs of the sector, the taxes we pay are affecting our competition adversely. When we eliminate these disadvantages, plastics industry will provide higher added value to Turkey's economy even further.

Negative developments in Turkish and the world economy, makes it difficult to compete with the standstill or even declining sales prices and narrow profit margins.

The most important problem of the industry that it can't provide sufficient added value. There are mainly two ways to provide higher value-added production and exports. To produce innovative high value-added products or to increase profit margins by reducing costs without compromising quality. To enhance production and export opportunities in a competitive global market without compromising on quality, the industry must produce environmentally friendly at EU standards.

The companies which can't compete with the change in prices due to increasing global competition, must issue the "Costs of the Competition "to the forefront, to increase profitability. To create a successful competition that makes the difference in cost, it is necessary to implement changes in the changing world beyond the known method of saving techniques,

If the sector needs technological products and R&D investments to move to high- tech products and increase added value, the incentive opportunities for the sector need to be revised.

In order to adopt to changes, R&D and P&D should be given first priority and also customer satisfaction must be focused on creating a value chain.

Ascending face of global competition, the only way to develop a competitive advantage is to manage the present and future costs and establish a new cost management system.

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The necessary work should be done in order for Turkey to become a production center of advanced plastics that will facilitate life. The traditional production model which does not add value to the sector should be transformed into the production of advanced plastics.

Despite the fact that only 13% of the raw material needs are covered by domestic production, the sector is deprived of the raw material supply facilities with high import prices and tax rates for the protection of domestic production at more economical prices. This reduces competitive export opportunities of sectors in global markets for the protection of the domestic raw material producer. Local producers should be protected by applying incentives to reduce production and investment costs instead of putting taxes on imports of raw materials. If the production of plastic raw materials cannot meet the need, importing obstacles must be removed. The plastic sector should be included in strategic investments regardless of foreign trade data and the minimum investment amount should be determined as 5 million dollars.

Because it is more rational to operate locally in the production of plastic products, the plastic sector must be supported at least on one province of each region. Necessary precautions should be taken for qualified staff in the sector.

The traditional production model, which does not add value to the sector, should be transformed into the production of advanced plastics.

6. PAGEV PROJECTS

PAGEV which is the “Unifying Power “of the Turkish Plastics Industry develops different projects aiming to solve the problems outlined above, these are in summary: "PAGEV Plastic Center of Excellence" and "International Regional Plastics Production Center".

6.1. PAGEV PLASTICS CENTER OF EXCELLENCE

Plastic materials, used in all areas of life, are rapidly taking place of other alternative products, because of their superior properties, in Turkey as well as in all over the world. Plastics, which usage in all sectors increasing is becoming an indispensable material for the 21st century.

Turkish Plastics Industry which is one of the fastest growing sectors in our country despite being young, is the 6th in the world and the 2nd in Europe. Growing with the goal of leadership in Europe, the Turkish Plastics Sector aims to increase the certification and added value of its products.

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PAGEV, "Unifying Power" of the Turkish Plastics Industry, is leading the industry with the "PAGEV Plastic Excellence Center" for realizing this purpose, the mission of the PAGEV Center for Plastic Excellence, will include the following activities.

- ✓ Research and Development
- ✓ Test and Laboratory Services
- ✓ Certification
- ✓ Training
- ✓ Competent Consulting

The platforms that will provide information to and knowledge sharing in the industry will be developed by the Center and detailed training programs will be prepared and presented for the benefit of the industry. While working on the newest technologies, the Center of Excellence will work together with industry organizations, universities, research institutes, professional associations and non-governmental organizations to work for the Turkish plastics industry to be the world leader with R & D and innovation based work.

With the Center of Excellence, the test and laboratory support that the plastic industry needs will be provided to the industry. Many problems that lead to loss of time and energy such as high test costs, overseas shipping, customs clearance, and long test times will be removed.

Established with the support of the Ministry of Science, Industry and Technology, PAGEV Plastic Center of Excellence will provide to the plastics industry and Turkish economy, especially the development of industrial skills and capabilities that will form the basis of Turkey's national projects,

By PAGEV Plastic Center of Excellence, which will be established by strategic cooperation, it is aimed to grow the plastic industry faster with its traceable targets, scientific quality and high potential for commercialization.

Upon completion, the Center of Excellence, which will have an area of over 30 thousand m², rises right beside PAGEV Vocational and Technical Anatolian High School in Küçükçekmece, Istanbul, PAGEV Plastic Center of Excellence, which will make Turkey the center of plastic production in the world, will carry out innovative projects.

In addition to this, the Center will create a control mechanism for the products exported abroad. The Center will also contribute to the preservation of the reliability and reputation of the plastic products produced in Turkey. On the other hand, the introduction of poor quality and non-

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standard goods into the country will be prevented by determining the technical suitability of the plastic products imported from abroad without any definite importation in the laboratories.

With its superior information infrastructure, the Center of Excellence will present the important documents required by the players of the sector more economically and quickly.

By accelerating the development, we will focus on the development of products and production technologies that will increase the competitive power of our firms.

The Center of Excellence, which will develop innovative ideas by following the developments in the world plastic sector, will increase the competitive power of our firms by providing many field consultancy services from the determination of appropriate input materials to the optimization of production process.

6.2. INTERNATIONAL REGIONAL PLASTIC MANUFACTURING CENTER

Although the Turkish Plastics Sector, with its process capacity reaching 9 million tons, has the 6th largest plastics production capacity in the world and 2nd in Europe, imports more than 85% of the plastic raw material it needs.

One of the most important advantages of the plastics industry in Turkey is that it is located between the Middle East countries which are the main petroleum and plastic raw material producer and the European market which is the main plastic consumer.

PAGEV aims to unify the plastic raw materials potential of Middle East countries with the Turkish plastics industry's competent production capability and experience at the international regional plastic production center, which Turkey aims to establish in South East Anatolia Region.

In the center, to be established with the win - win principle, the plastics raw materials producer countries will be supplying cheap and reliable raw materials having a large volume and reliable market while Turkish plastics industry will have greater competition possibilities in the global markets with its growing production capacity and falling costs.