



TURKEY

PLASTICS INDUSTRY

FOLLOW - UP REPORT

2016 / 6 MONTHS

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EXECUTIVE SUMMARY

As OECD upgrading the growth forecast for Turkey from 3,4 % to 3,9 % also downgrade for 2017 from 4,1 % to 3,7 % OECD foresees inflation would be 7,9 % and 7,3 % in 2016 and 2017 respectively, pointing out the minimum wage increase will have a negative impact on Turkey's competitiveness and exports.

The main factors attracting global economic growth down in 2015, is expected to continue in 2016, ensuring the sustainability of global growth in 2016 is taken as the main target.

Emerging and developing economies are faced with adverse conditions, geopolitical tensions are increasing the challenges of the global economy. The three main factors that will affect the global economy in 2016; The Fed's monetary normalization, the course of China's economy and the unstable commodity prices.

Decline in oil prices will stimulate domestic demand in both developed and developing countries and fall in the current account deficit of non-oil producing countries, will have a positive impact on the decline of inflation and interest rates. However, the expected decline in global money supply in 2016, will be forced to more structural reforms for growth in developing countries.

In the first quarter of 2016 the positive trend in economic activity continued and Turkey's economy grew slightly above the market consensus of 4,5 % and 4,8 % on an annual basis. On the other hand, national income on the basis of the USD has continued to decline due to the impact of the depreciation of TL.

The growth of consumption has been the engine of production increase in the first half of 2016. As a summary in this period; in this period, pproduction has been realised as 4, 6 million tons and USD 17, 8 billion. The production is expected to increase to 9, 2 million tons and USD billion of 35, 6 increasing by 8 % on amount and value bases by the end of the year.

Turkey, is one of the countries which carrying the risk of fragility in 2016. High current account deficit, inflation growth, the need for increased funding of the risks will be the main risk for Turkey's economy in 2016.

The 2023 export vision of the industry is to accrue at least 17 billion dollars of the 50 billion dollar export target of the chemical industry. For such degree of export to be performed, in parallel with its growth, the industry must concentrate on manufacture and export of products with high added values, to increase its unit export prices to 4,5 \$ / kg, average of developed countries and make the best of the investment incentives apart from resolving the increasing number of problems.

1. ECONOMIC SITUATION

1.1. WORLD ECONOMY

Markets witnessed severe bouts of volatility due to the widely unexpected “leave” result of the Brexit referendum held on June 23. Sterling depreciated considerably and safe haven assets attracted strong demand.

In the aftermath of the referendum, emerging expectations that leading central banks would loosen their monetary policies in order to struggle with rising risks stemming from the outcome of Brexit have given the markets the opportunity to take a sigh of relief. Indeed, the head of BoE, Mark Carney, hinted that policy rate, which currently stands at 0,5 %, could be cut in summer months.

The new picture arisen with Brexit and the Brexit related issues caused the Fed’s rate hike expectations of the markets for 2016 weaken to a large extent while only 1 rate hike is anticipated in 2017. Fed officials also revised down their interest rate expectations for the coming years in June meeting.

Euro Area consumer prices increased in June for the first time in 5 months. The final reading suggested that economic growth in the region came in at 0,6%. It was a positive development that the highest contributions to growth came from household expenditures and private sector investments.

Oil prices fluctuated during the recent weeks in response to the trajectory of the US dollar, the US crude inventories and the changing expectations for global growth.

In June 2016, seeking direction in global markets has been effective, and the developing countries in the financial market has been dominated by a wavy appearance. OECD Economic Outlook report released in early June stated that due to the global economy's low growth trap, global growth for 2016 and 2017 has been estimated at 3 % and 3,3 % respectively.

As a summary; the main factors attracting global economic growth down in 2015, is expected to continue in 2016, ensuring the sustainability of global growth in 2016 is taken as the main target.

Emerging and developing economies are faced with adverse conditions, geopolitical tensions are increasing the challenges of the global economy. The three main factors that will affect the global economy in 2016; The Fed's monetary normalization, the course of China's economy and the unstable commodity prices.

Apart from the main factors, the subjects which will affect the global and Turkish a-economy, are as follows:

- ✓ Recovery in the US economy,
- ✓ Developments in the euro area,
- ✓ Current problems in Greece and Ukraine,
- ✓ Immigration issues, labor market participation capacity and other political issues,
- ✓ Developments in emerging markets,
- ✓ The ability of commodity exporters, to tolerate adverse effects caused by the rapid decline in commodity prices capabilities,
- ✓ The trend of regional trade agreements between USA and Europe,
- ✓ The decisions of the countries to reduce carbon emissions.

1.2. TURKISH ECONOMY

1.2.1. GROWTH

In the first quarter of 2016 the positive trend in economic activity continued and Turkey's economy grew slightly above the market consensus of 4,5 % and 4,8 % on an annual basis during this period. In this period, growth in domestic demand has been the basic dynamics of economic growth. On the other hand, national income on the basis of the USD has continued to decline due to the impact of the depreciation of TL.

The consumer spending sharing 80 % in GDP have shown the fastest annual increase for the last 18 quarters. During this period, the strong performance of consumer spending contributed by 5,9 % due to the increase in the minimum wages and decisive recovery in private consumption. The highest increase of 10,9 % in public expenditure in this period has also been realized for the last 5 years. This case resulted from recording the fastest rise in goods and services expenditures since the last quarter of 2009. In this context, the contribution of public consumption expenditure growth has occurred at a relatively high level of 1,25.

Total investment expenditures don't have a significant impact on growth in the first quarter. While the growth of private sector investment spending reducing as much as 0,1 percentage points, the level of public investment spending has contributed negligible level on growth. The weak investment expenditures negatively affect medium-term growth

Continued flow of asylum-seekers in 2015 with the support of the domestic demand - induced growth performance exhibits Turkey's economy has continued this trend in the first quarter of this year. The basic dynamics of the growth of consumer spending in the 2nd quarter of the year is expected to continue. On the other hand, the ongoing problems in our main export markets, the current trend of commodity prices, it is not possible to draw a positive picture for the upward trend in net exports due to import demand. In this context,

moderate growth in economic activity will continue and the economy is expected to finish with a growth rate in 2016 as 3,5 % is.

As OECD upgrading the growth forecast for Turkey, from 3,4 % to 3,9 % also downgrade for 2017 from 4,1 % to 3,7 % OECD foresees inflation would be 7,9 % and 7,3 % in 2016 and 2017 respectively, pointing out the minimum wage increase will have a negative impact on Turkey's competitiveness and exports.

	2016	2017
World	3,0	3,3
USA	1,8	2,2
Euro Area	1,6	1,7
Germany	1,6	1,7
Italy	1,0	1,4
Japan	0,7	0,4
UK	1,7	2,0
China	6,5	6,2
Brazil	(-) 4,3	(-) 1,7
Turkey	3,9	3,7

Table 1: OECD Growth Rate Expectation

Source: OECD

1.2.2. UNEMPLOYMENT

The number of unemployed above the age of 15 in Turkey in April 2016 increased by 3 thousand persons compared to the same period last year which was 2 million 824 thousand people. Unemployment rate realized as 9,3 % with a 0,3 percentage points decrease. In the same period; Non-agricultural unemployment rate was estimated to be 11 % with a 0,6 percentage point decline, while the youth unemployment rate that includes the 15-24 age group, realizing as 16 % decrease by 1 percentage point, this ratio decreased 0,3 % points in the 15-64 age group and has been realized as 9,5 %.

The ratio of persons who worked without any social security institutions in April 2016, amounted to 33,5 % with an increase of 0,2 points compared to the same period of the previous year.

1.2.3. INDUSTRIAL PRODUCTION

Industrial production has made a poor start to the second quarter of the year. Industrial production increased 0,7 % on an annual basis in April showed the weakest performance since July 2015. The slowdown in industrial production in this period has come to the fore.

Manufacturing industry capacity utilization rate (CUR) has reached the highest level since October 2013 realized as 76,1 % in June by increasing 1 %.

Manufacturing PMI is a row of 4 months has pointed to worsening operating conditions in the manufacturing sector realized under the 50 threshold. The index declined to 47,4 in June to the lowest level since April 2009. During this period, it is seen that the production and new orders fell sharply.

1.2.4. FOREIGN TRADE

Exports in June 2016, compared to the same month of 2015 rose by 8.1 % to USD 12 billion 916 million dollars, and imports realizes as USD 19 billion 475 million, increased by % 7. The foreign trade deficit in June 2016 increased by 6 % to USD 5 billion 559 million.

While the share of exports to European Union (EU-28) in June 2015 was 46.1 %, in June 2016 increased to 48,5 %. Exports to the EU, with an increase of 13,8 % compared to the same month of 2015 increased to USD 6 billion 267 million. Exports to Germany in June 2016 was USD 1 billion 228 million, UK, Italy and USA followed Germany respectively.

Imports from China, in June 2016 have been realized as USD 2 billion 602 million. Germany, US and Russia followed this country respectively.

The share of manufacturing products based on ISIC Rev. 3 in total exports in June 2016 realized as 94,3 %. The share of exports of high-tech products manufacturing industry realized by 3,5 %, while the share of medium-high technology products by 33,4 %.

The share of manufactured goods in total imports is 86,2 % the share of high-tech products in total imported manufactured goods in June was 20,4 %, while the share of medium-high technology products realized as 42,9 %, respectively.

While export-import ratio in June 2015 was 65,7 % in 2015, it rose to 66,3 % in June 2016.

Considering that a 2-year transition period for Brexit foreseen in the short term in terms of commercial relations between the parties is considered to have significant risk. However Brexit, United Kingdom and / or in the case of medium and weaken the EU economy over the long term can be especially composed downward pressure on exports. In addition, our largest export market, with the Brexit indirectly, depending on political developments in the EU, our country will be able to induce a negative impact on the economy.

In the near term, improvement in Turkey-Russia relations will support our external trade in this context, the positive export trend, the moderate trend in oil money to strengthen domestic demand and commodity prices is expected to continue, albeit losing momentum in line with the trend of imports down.

1.2.5. INFLATION

Domestic producer price index in June 2016 showed 3,41 % increase compared to the same month of the previous year. CPI (2003 = 100) increased 7,64 % in June 2016 compared to the same month of the previous year.

1.2.6. EXPECTATIONS

Low level of energy prices continue to mitigate risks to the current account deficit. However, the weak performance of global trade and geopolitical risks pose downward pressure on exports. In 2016, the current account deficit may increase the risk on the impact of the expected contraction in tourism revenues, but relative to the deficit is expected to remain at low levels.

The most important factors that affect the development of Turkey's economy in 2016; Growth will be affected by increase in domestic demand more than in external demand. While domestic demand will depend on public spending, the recovery in the growth of the EU economy on exports, is estimated to be due to growth in the Chinese economy and regional risks. On the other hand inflation is expected positive reflections, due to the decline in oil and energy prices. Because of political and economic risks, planned growth in Turkey's economy in 2016 will take place at lower levels. Turkey, carrying the risk of fragility in 2016 is one of the economies which high current account deficit, a slowdown in the growth rate, increasing financing needs and the hot money out.

In 2016 it is expected that in Turkey's economy, the driving force behind the growth of domestic demand. Domestic demand in terms of sectors, the expected increase in the contribution to economic growth as well as lower trend in commodity prices, the recovery trend in the EU countries and the lifting of sanctions against Iran is drawing attention as a positive development for 2016. On the other hand, problems in export markets, particularly Russia and Middle Eastern countries, geopolitical developments and volatility in financial markets are likely to be observed in the major risk factors.

Especially fluctuations in exchange rates, stands out as a factor that increases the vulnerability of the sector by increasing costs. Similar to 2015, avoiding risks rather than growth expectations will be focused. (Sources: Türkiye İş Bankası and Akbank Economic Publications, Ministry of Development, TSI)

		2014	2015	2016
GDP	USD Billion	799,0	789,4	169,5 (I.Q)
GDP Growth Rate	%	2,9	4,0	4,8 (I.Q)
PPI Annual	%	8,2	8,8	7,64 (June)
WPI Annual	%	6,4	5,7	3,41 ((June)

Unemployment	%	10,4	10,3	9,3 (May)
Exports	USD Billion	157,6	143,9	71,7 (June)
Imports	USD Billion	242,2	207,2	99,7 (June)
Foreign Trade Balance	USD Billion	-84,6	63,3	-28,0 (June)
Exports / Imports	%	65,1	69,5	71,9 (June)
Current Account Balance	USD Billion	-46,5	- 32,2	-28,6 (April)
Current Account Balance /GDP	%	-5,8	- 5,5	
Budget Balance / GDP	%	-1,3	-1 ,3	
Total Debt Stocks	Billion TL	614,1	612,1	700,5 (May)
USD / TL	TL	2,3290	2,9207	2,8943 (June)
EURO / TL	TL	2,8297	3,1867	3,2183 (June)

Table 2: Main Economic Indicators - Turkey

Source: Turk Stat, Ministry of Economics, Undersecretary of Treasury, Central Bank

2. DEVELOPMENTS IN TURKISH PLASTICS END PRODUCT INDUSTRY

2.1. PLASTICS PRODUCT MANUFACTURING

Plastics end products production has been realized as 4,6 million tons and USD billion of 17,8 in the first half period of 2016 and expected to increase to 9,2 million tons and USD billion of 35,6 at the end of the year, increasing by 7,7 % on amount base and 8,3 % on value base with respect to 2015.

	2015	2016 / 6	2016 / E	% Increase 2016/2015 (E)
1000 Tons	8,568	4,6	9,2	7,7
USD Million	32,846	17,8	35,6	8,3

Table 3: Plastics End Products Production

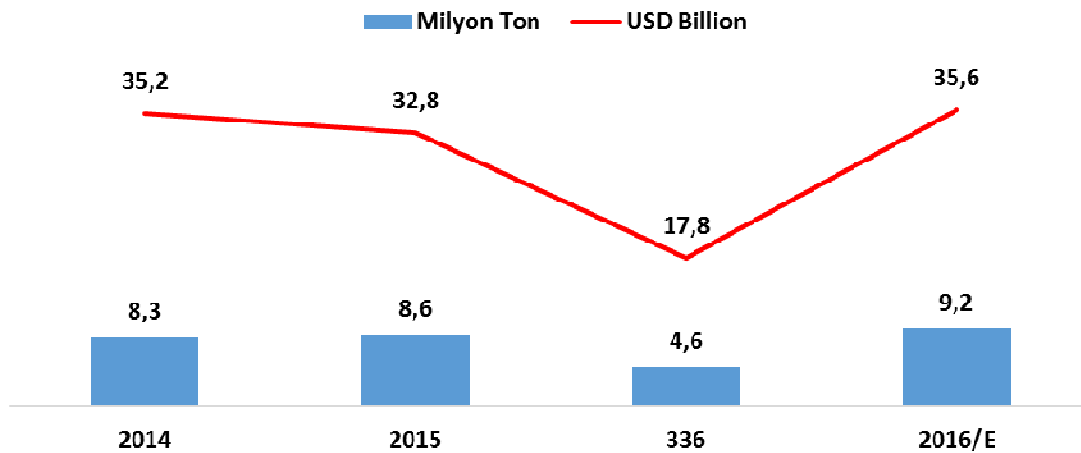


Figure 1: Plastics End Product Production

2.2. CAPACITY USAGE

In the first half period of 2016, the average capacity utilization rate of the industry realized as 71 % which was 2 points less than the average capacity utilization rate of general manufacturing industry.

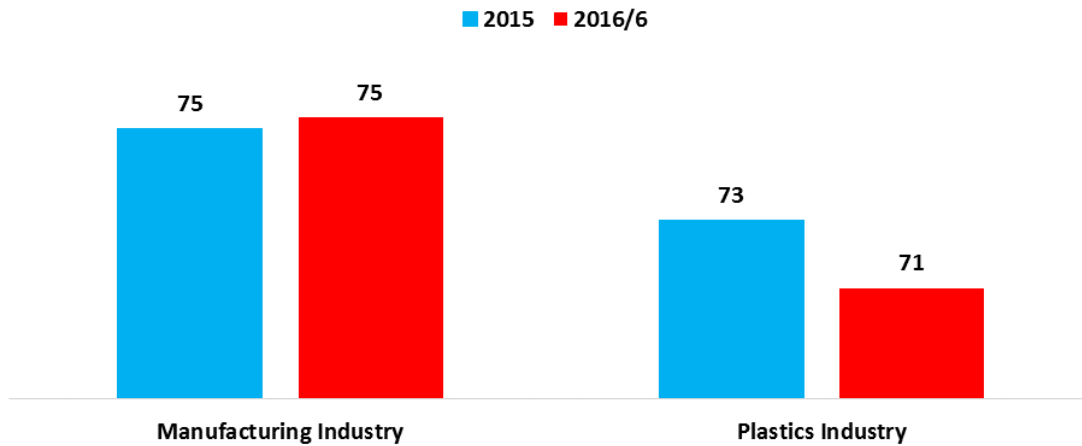


Figure 2: Capacity Utilization Rate in Plastics Industry (%)

Source: Turk Stat

2.3. BREAKDOWN OF PLASTICS END PRODUCTS PRODUCTION BY SUB SECTORS

It is observed that plastic packaging materials led the way with 4,6 million tons and plastic construction materials following packaging with 1,02 million tons within total plastic product manufacture of 4,6 million tons in the first half period of 2016.

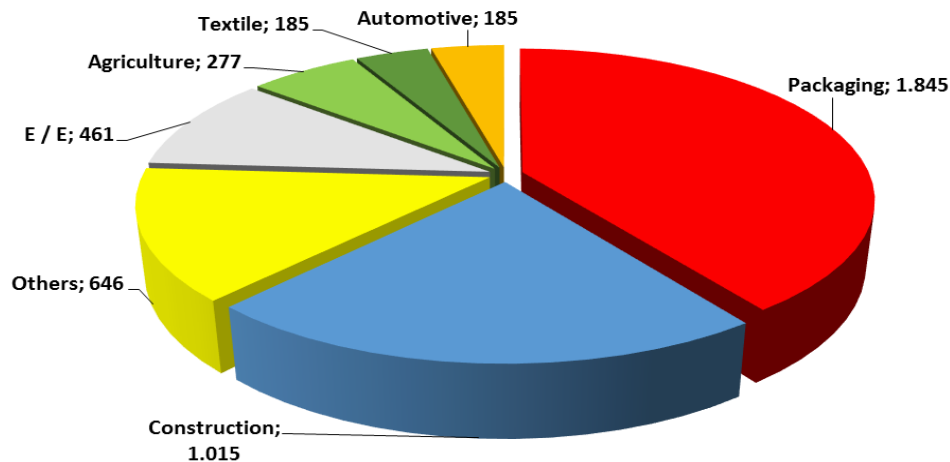


Figure 3: Production by Sub Sectors – 2016/6 (1000 Tons)

2.4. MACHINERY AND EQUIPMENT INVESTMENT OF PLASTICS INDUSTRY

Annual investment of machinery and equipment in Turkish plastics industry has been realized as USD 821 million between the periods of 2011 – 2015. Thirty six percent of which was presses and other machines, 23 % injection machines, 18 % extrusions, 5 % thermoform machines, 3 % blow molding machines and 14 % parts and components.

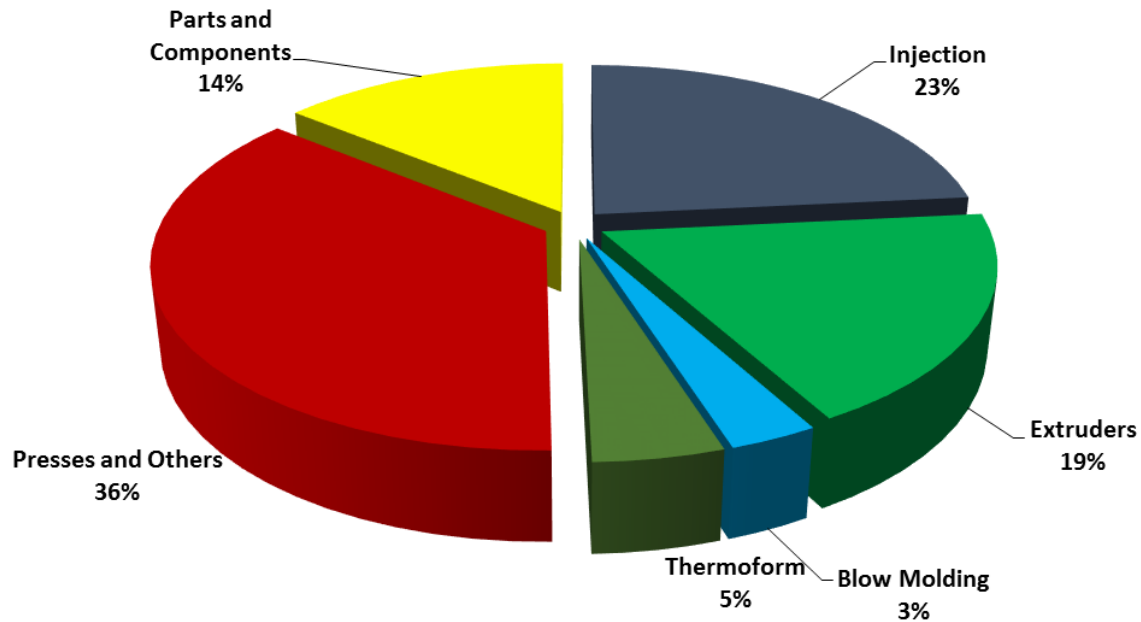


Figure 4: Breakdown of Machinery Investments of Plastics Industry (2011 – 2015) %

In the first half period of 2016, the total machinery and equipment investment of the industry realized as USD million of 443 and It is expected that, the sector's total machinery and equipment investment to be USD million of 886 by the end of 2016 increasing by 6 % compared to 2015.

The plastics industry made a machinery and equipment investment of around 8 billion dollars between 2003 – 2015 September and 79 % of this investment was met by imported machines. It is observed that an annual average of 608 million dollars machinery and equipment investment has been made within the last 13 years.

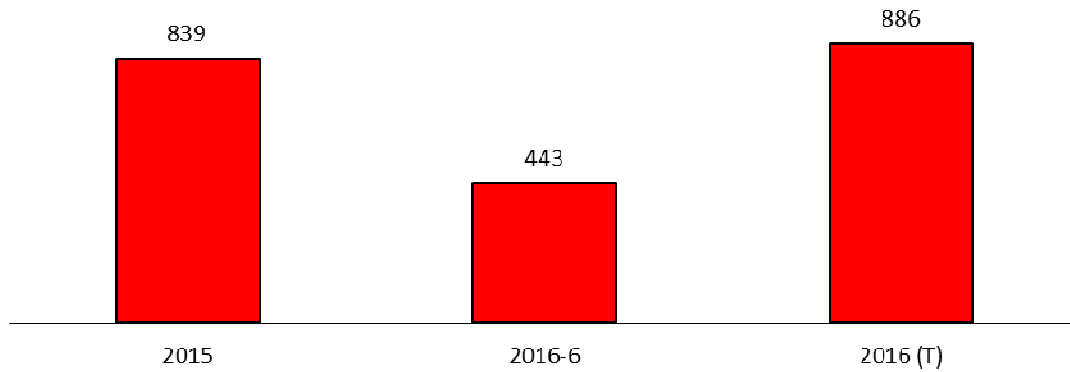


Figure 5: Machinery Investments of Plastics Industry (USD Million)

Source: Turk Stat

Of the USD billion of 555 investment within the first half of 2016, 35 % was comprised of presses and other machineries, 20 % of injection machines, 17 % of extrusion machines and 21 % of components and parts. Thermoform and blow molding machines shared 5 % and 2 % respectively.

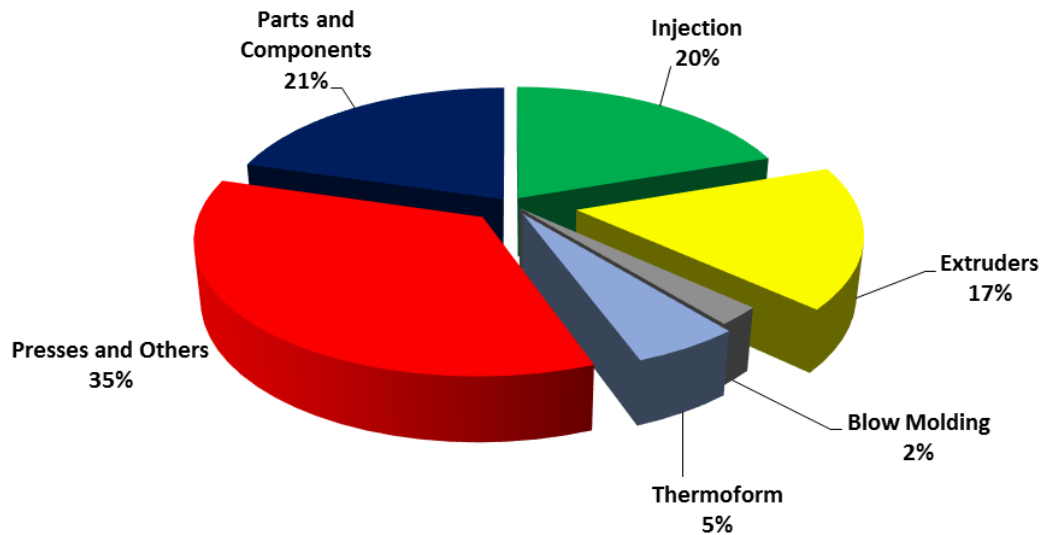


Figure 6: Machinery Investments of Plastics Industry (2016/6)

Source: Turk Stat

2.5. PLASTICS PRODUCT IMPORTS

Plastic product import realised as 301 thousand tons and USD 1 billion and 509 thousand in the first half of 2016 and expect to be 602 thousand tons and USD 3 billion and 18 million by the end of 2016 increasing by 3 % on amount and 5 % on value base with respect to 2015.

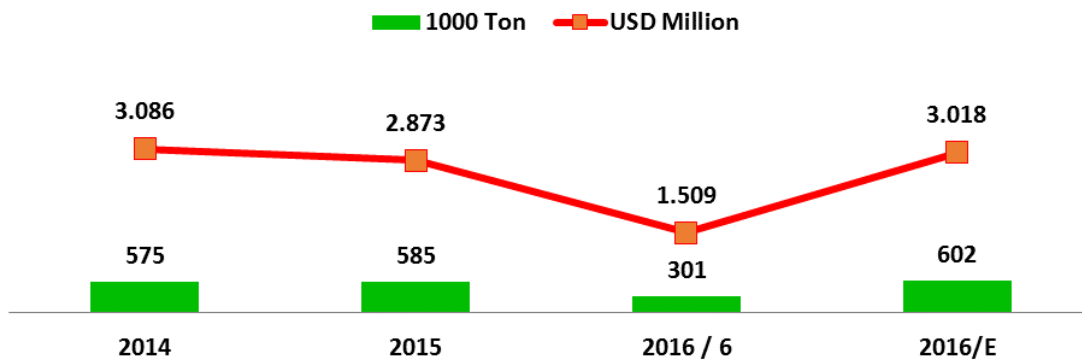


Figure 7: Plastics End Products Imports

Source: Turk Stat

In the first half of 2016, biggest import was realized in 3920 custom duties numbers (other plate, sheet, pellicles and slides from plastic) on amount and value base. The import of this product group constituted 43 % of total end products imports on amount and 31 % on value base.

HS Code	Plastic products definitions	2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	12	7	14	15
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	24	13	25	5
3918	Floor coverings from plastic – incl. wall and ceiling coverings	28	10	20	-28
3919	Adhesive plate, sheet, strip, slide, etc. from plastic; flat	57	31	63	10
3920	Other plate, sheet, pellicles and slides from plastic	256	128	256	0
3921	Other plates, sheets, pellicles, foils and slides from plastic	65	33	65	0
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	5	2	5	-5
3923	Plastic products for moving furniture, tap, cap, capsule	47	30	60	27
3924	Table, kitchen and other household furniture, toiletry form plastic	12	6	11	-3
3925	Construction materials from plastic	10	5	10	3
3926	Other goods from plastic	68	36	72	6
	Total imports	585	301	602	3

Table 4: Plastics Product Imports on HS Basis (1000 Tons)

Source: Turk Stat

HS Code	Plastic products definitions	2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	52	30	59	13
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	197	104	208	6
3918	Floor coverings from plastic – incl. wall and ceiling coverings	69	42	83	20
3919	Adhesive plate, sheet, strip, slide, etc. from plastic; flat	323	181	363	13
3920	Other plate, sheet, pellicles and slides from plastic	922	470	939	2
3921	Other plates, sheets, pellicles, foils and slides from plastic	254	130	259	2
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	49	22	43	-11
3923	Plastic products for moving furniture, tap, cap, capsule	221	137	274	24
3924	Table, kitchen and other household furniture, toiletry form plastic	81	37	75	-7
3925	Construction materials from plastic	47	21	42	-10
3926	Other goods from plastic	658	336	672	2
	Total imports	2,873	1,509	3,018	5

Table 5: Plastics Product Imports on HS Basis (USD Million)

Source: Turk Stat

2.6. PLASTIC PRODUCT IMPORT BY COUNTRIES

Turkey imports plastic product from over 100 countries every year. Import, made from 10 main countries in 2015, comprised 72 % on amount basis and 76 % on value basis of the total imports. The share of top 10 countries remained the same in the first half of 2016.

It is observed that China has become prominent since 2014. In the first half of 2016 China shared 27 % of total end product imports on amount and 20 % on value base and Germany, Italy, South Korea and France have preserved position in being the countries with which import is conducted the most.

2015					2016/6				
Country	1000 Tons	USD Million	Ton - %	\$ - %	Country	1000 Tons	USD Million	Ton - %	\$ - %
China	158	633	27	22	China	81	309	27	20
Germany	94	538	16	19	Germany	49	286	16	19
Italy	47	235	8	8	Italy	26	128	9	8
S.Korea	33	188	6	7	S.Korea	17	107	6	7
France	26	165	4	6	France	14	95	5	6
USA	11	123	2	4	USA	7	70	2	5
UK	13	102	2	4	UK	6	50	2	3
Belgium	18	80	3	3	Belgium	8	39	3	3
Spain	11	58	2	2	Spain	6	33	2	2
Netherland	10	49	2	2	Japan	2	28	1	2
10 Country	419	2,170	72	76	10 Country	215	1,144	72	76
Others	165	703	28	24	Others	86	365	28	24
Total	585	2,873	100	100	Total	301	1,509	100	100

Table 6: Major Import Partners in Plastics Products

Source: Turk Stat

2.7. PLASTIC PRODUCT EXPORT:

Plastic end products export realized as 784 thousand tons and USD 2 billion and 113 million in the first half of 2016. It is expected to increase to 1 million 568 thousand tons and USD 4 billion and 226 million by the end of 2016, staying with the same amount but decreasing by 4 % on value base with respect to 2015.

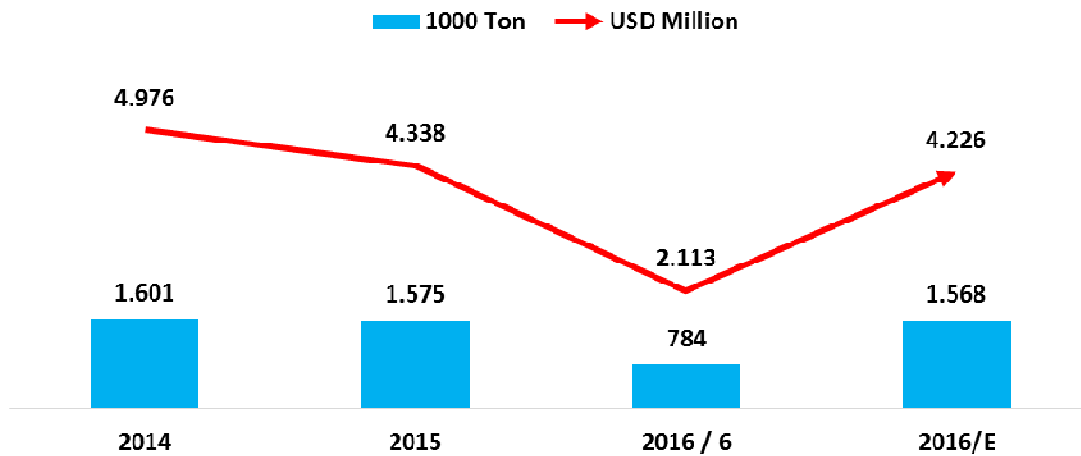


Figure 8: Plastics End Products Exports

In the first half of 2016, HS codes of 3920 (other plate, sheet, pellicles and slides from plastic) and 3923 (plastic products for moving furniture, tap, cap, capsule) shared the biggest parts of total exports on amount and value bases. These 2 groups of products shared 46 % of total plastics end products exports on amount and 42 % on value base.

HS Code	Plastic products definitions	2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	156	66	132	-15
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	283	111	221	-22
3918	Floor coverings from plastic – incl. wall and ceiling coverings	15	7	15	-1
3919	Adhesive plate, sheet, strip, slide, etc. from plastic; flat	19	10	21	6
3920	Other plate, sheet, pellicles and slides from plastic	339	188	377	11
3921	Other plates, sheets, pellicles, foils and slides from plastic	129	68	135	5
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	24	12	25	2
3923	Plastic products for moving furniture, tap, cap, capsule	324	174	348	7
3924	Table, kitchen and other household furniture, toiletry form plastic	111	62	123	11
3925	Construction materials from plastic	106	49	98	-8
3926	Other goods from plastic	69	37	74	8
	Total imports	1,575	784	1,568	0

Table 7: Plastic Product Exports on HS Basis (1000 Tons)

Source: Turk Stat

HS Code	Plastic products definitions	2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3916	Monofilament, bar, profiles from plastic-cross section over 1mm	297	91	218	-27
3917	Tubes, pipes, hoses from plastic; gasket, elbow, union etc.	718	250	599	-17
3918	Floor coverings from plastic – incl. wall and ceiling coverings	30	12	29	-3
3919	Adhesive plate, sheet, strip, slide, etc. from plastic; flat	115	50	119	3
3920	Other plate, sheet, pellicles and slides from plastic	915	387	928	1
3921	Other plates, sheets, pellicles, foils and slides from plastic	386	161	387	0
3922	Bathtub, shower, sink, bidet, water-closet pan and hardware from plastic	107	42	101	-6
3923	Plastic products for moving furniture, tap, cap, capsule	809	343	823	2
3924	Table, kitchen and other household furniture, toiletry form plastic	346	151	363	5
3925	Construction materials from plastic	264	90	216	-18
3926	Other goods from plastic	351	151	363	4
	Total imports	4,338	1,727	4,146	-4

Table 8: Plastic Product Exports on HS Basis (USD Million)

Source: Turk Stat

2.8. PLASTIC PRODUCT EXPORT BY COUNTRIES

Turkey exports plastic end products to approximately 150 countries. While the 10 leading countries received as share of 46 % on amount and 45 % on value basis in 2015, these shares stayed at the same levels in the first half of 2016.

Iraq, Germany, UK, France and Israel comprised the leading 5 export markets to which plastic end product is exported in the first half of 2016.

2015					2016/6				
Country	1000 Tons	USD Million	Ton - %	\$ - %	Country	1000 Tons	USD Million	Ton - %	\$ - %
Iraq	227	464	14	11	Iraq	89	172	11	8
Germany	82	266	5	6	Germany	49	161	6	8
UK	75	218	5	5	UK	40	102	5	5
France	51	172	3	4	France	29	92	4	4
Israel	61	151	4	3	Israel	38	86	5	4
Azerbaijan	53	149	3	3	Romania	28	75	4	4
Iran	41	139	3	3	Italy	28	73	4	3
Romania	52	134	3	3	Iran	21	64	3	3
Italy	44	126	3	3	Bulgaria	22	62	3	3
Russian Fed.	37	123	2	3	Spain	20	53	3	3
10 Countries	724	1,943	46	45	10 Countries	364	941	46	45
Others	851	2,395	54	55	Others	420	1,172	54	55
Total	1,575	4,338	100	100	Total	784	2,113	100	100

Table 9: Major Export Partners for Plastics Products

Source: Turk Stat

Russian Federation, which shared 2, 8 % and took place in the first 10 leading export markets in 2015, it's share declined to 1, 16 % and place to 25th in the first half of 2016. On the other hand, Bulgaria and Spain placed in the first 10 leading export markets in this period.

2.9. PLASTIC PRODUCTS FOREIGN TRADE PRICES

Unit import prices of plastic products has always cruised over unit export prices since 2000.

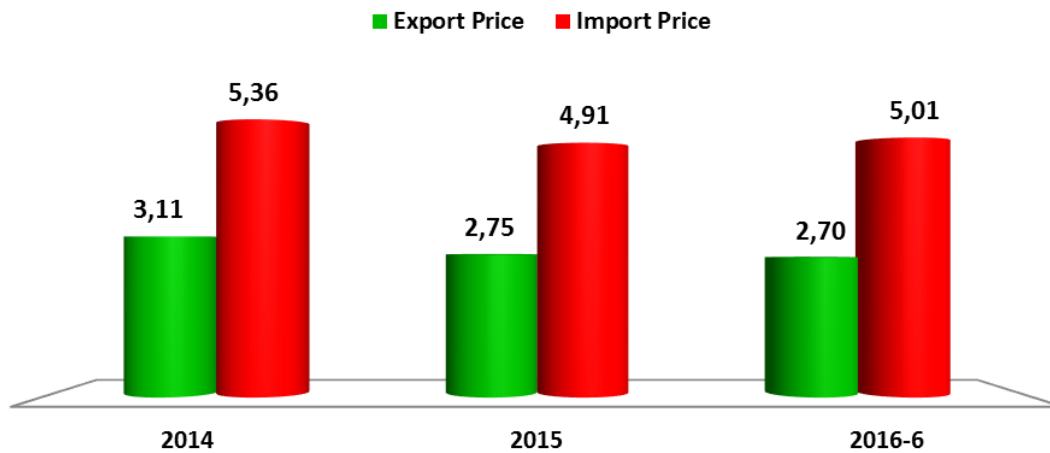


Figure 9: Average Foreign Trade Prices for Plastics End Products

In the first half of 2016, plastic end products average import unit price realized as USD 5,01 USD/kg in increasing by 2 % compared to 2015. On the other hand, average export unit price, realized USD 2,70 USD/kg decreasing by 2 % with respect to 2015.

HS Code	Import Prices			Export Prices		
	2015	2016/6	% Increase	2015	2016/6	% Increase
3916	4,26	4,18	-2	1,90	1,75	-8
3917	8,25	8,29	1	2,54	2,68	6
3918	2,47	4,14	68	2,01	1,94	-3
3919	5,62	5,77	3	5,95	5,88	-1
3920	3,60	3,67	2	2,70	2,52	-7
3921	3,88	3,96	2	3,00	2,93	-2
3922	9,93	9,32	-6	4,42	4,16	-6
3923	4,69	4,58	-2	2,50	2,41	-3
3924	6,94	6,60	-5	3,11	2,97	-4
3925	4,67	4,06	-13	2,48	2,29	-8
3926	9,66	9,33	-3	5,10	5,03	-1
Average	4,91	5,01	2	2,75	2,70	-2

Table 10: Unit Foreign Trade Prices in Plastics Products (USD/kg)

Source: Turk Stat

2.10. FOREIGN TRADE SURPLUS IN PLASTICS PRODUCT

Turkey always gives foreign trade surplus in plastic products. In the first half period of 2016, foreign trade surplus of plastics end products realized as 483 thousand tons and USD million of 604 and expected to be 966 thousand tons and USD 1 billion and 209 million, decreasing by 2,5 % on amount and 17 % on value bases compared to 2015.

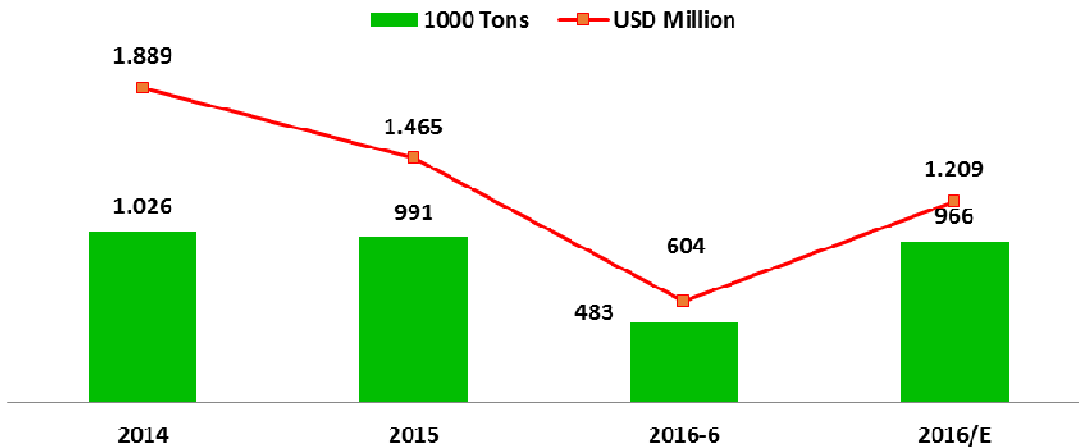


Figure 10: Foreign Trade Surplus in Plastics End Products

Source: Turk Stat

2.11. PLASTIC PRODUCT DOMESTIC MARKET CONSUMPTION

Plastics products domestic market consumption, which realized as 4,1 million tons and USD billion of 17,2 in the first half of 2016, is expected to be 8,3 million tons and USD 34,4 billion by the end of 2016 increasing by 9 % on amount and 10 % on value base.

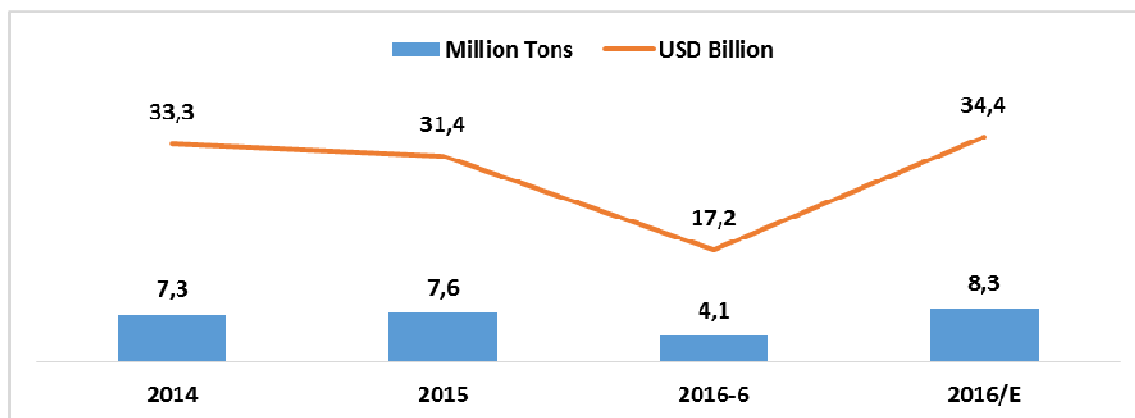


Figure 11: Plastics End Products Domestic Consumption

Approximately 2 million and 50 thousand tons of total plastics end products domestic consumption were indirectly exported in the first half of 2016 through channels of exporter industries such as automotive, packaging, construction and electronics. The remaining 2 million and 50 thousand tons section; on the other hand, was directly consumed by consumers.

2.12. GENERAL SUPPLY AND DEMAND EQUILIBRIUM IN THE FIRST HALF OF 2016 AND EXPECTATIONS BY THE END OF YEAR IN PLASTIC PRODUCTS

The growth of consumption has been the engine of production increase in the first half of 2016. As a summary in this period;

- ✓ Production has been realised as 4,6 million tons and USD 17, 8 billion. The production is expected to increase to 9,2 million tons and USD billion of 35,6 increasing by 8 % on amount and value bases by the end of the year.
- ✓ Imports has been realized as 301 thousand tons and USD billion of 1,5 and expected to be 602 thousand tons and USD 3 billion and 18 thousand, increasing by 3 % on amount and 4 % on value base by the end of the year.
- ✓ Exports has been realized as 784 thousand tons and USD 2, 1 billion and expected to increase to 1 million 568 thousand tons and USD 4 billion and 226 thousand, staying at the same level on amount but decreasing by 3 % compared to 2015 by the end of 2016.
- ✓ Domestic consumption, including those used for indirect exports, realized as 4 million 130 thousand tone and USD 17,2 billion and expected to increase to 8 million and 259 thousand tons and USD 34 billion and 353 thousand increasing by 9 % on amount and value bases by the end of the year.
- ✓ Foreign trade surplus realized as 483 thousand tons and USD 604 million and expected to increase by 2 % on amount and decreasing by 17 % on value base “compare to 2015 by the end of the year.
- ✓ Seventeen percent of domestic production on amount and 13 % of on value bases were exported.
- ✓ Seven percent on amount and 9 % on value bases of domestic consumption, including those used for indirect export, was met by imports.
- ✓ Export-import coverage ratio, on the other hand, realised as 261 % on unit basis and 140 % on value basis.

	2015	2016/6	2016 (E)	% Increase 2016/2015
Production	8,568	4,613	9,226	8
Import	585	301	602	3
Export	1,575	784	1,568	0

Domestic Consumption	7,577	4,130	8,259	9
Foreign Trade Surplus	991	483	966	-2
Export / Manufacturing (%)	18	17	17	
Import / Domestic Consumption (%)	8	7	7	
Export / Import (%)	269	261	261	

Table 11: General Supply and Demand Equilibrium in Plastic Products (1000 Tons)

	2015	2016/6	2016 (E)	% Increase 2016/2015
<i>Production</i>	32,846	17,781	35,562	8
<i>Import</i>	2,873	1,509	3,018	5
<i>Export</i>	4,338	2,113	4,226	-3
<i>Domestic Consumption</i>	31,381	17,176	34,353	9
<i>Foreign Trade Surplus</i>	1,465	604	1,209	-17
<i>Export / Manufacturing (%)</i>	13	12	12	
<i>Import / Domestic Consumption (%)</i>	9	9	9	
<i>Export / Import (%)</i>	151	140	140	

Table 12: General Supply and Demand Equilibrium in Plastic Products (USD Million)

3. TURKISH PLASTIC RAW MATERIAL INDUSTRY

3.1. PLASTIC RAW MATERIAL MANUFACTURING

It is presumed that plastic raw material manufacturing, in the first half of 2016 ended with approximately 507 thousand tons.

	(1000 Tons)
LDPE	157
HDPE	46
PP	66
PVC	71
PS	46
PET	122
TOTAL PRODUCTION	507

Table 13: Plastic Raw Material Domestic Manufacturing (2015/6)

Source: PETKİM and Other Producers

Thirty one percent of the total plastic raw materials produced in the first half of 2016 in Turkey is LDPE. On the other hand 24 % of the production is PET, 14 % PVC, 9 % PS, 9 % HDPE.

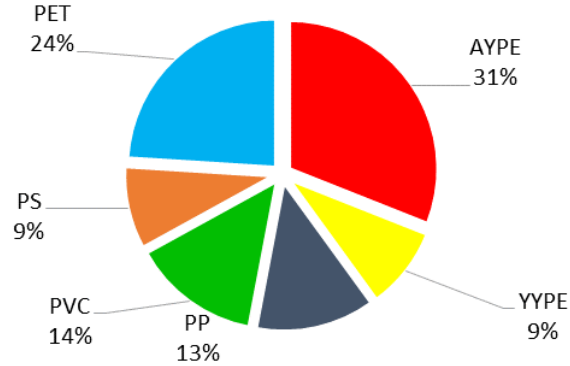


Figure 12: Plastics Raw Materials Production (2016/6)

Source: PETKİM and Other Producers

3.2. PLASTIC RAW MATERIALS IMPORT

In the first half of 2016, 3 million 414 thousand tons of plastics raw materials were imported with a value of USD 4 billion and 530 million. Imports of plastics raw materials are expected to be 6 million 828 thousand tons and USD 9 billion and 60 million by increasing 8 % on amount and decreasing by % 4 on value bases by the end of the year.

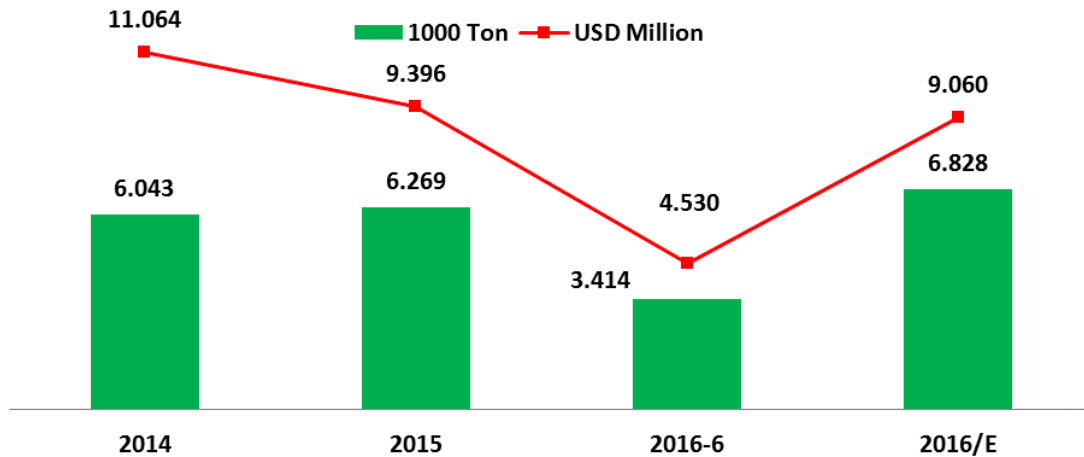


Figure 13: Plastics Raw Materials Imports

Source: Turk Stat

In the first half of 2016 the plastics raw materials in the 3901 and 3902 HS groups (polyethylene and polypropylene) shared the biggest part of the total imports on amount base. These raw materials shared 57 % of total plastics raw materials imports.

HS Code		2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3901	Ethylene polymers (initial forms)	1,600	747	1,792	12
3902	Propylene and polymers of other olefins (initial forms)	1,943	878	2,107	8
3903	Styrene polymers (initial forms)	512	236	566	11
3904	Other olefin polymers with vinyl chloride/homogenous	834	323	776	-7
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	42	21	50	19
3906	Acrylic polymers (initial forms)	198	88	211	7
3907	Polyacetals, other polyether, epoxide-alkyd resins (initial forms)	628	286	687	9
3908	Polyamides (initial forms)	87	40	96	11
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	217	92	222	2
3910	Silicones (initial forms)	30	13	32	8
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	29	13	32	12
3912	Cellulose and chemical derivatives (initial form)	39	16	39	2
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	3	2	4	23
3914	Polymer based ion exchangers (initial form)	6	2	5	-9
3915	Wastes, residuals and scraps from plastic	104	69	165	59
	Plastic raw material total	6,269	2,827	6,784	8

Table 14: Plastic Raw Material Imports on HS Basis (1000 Tons)

Source: Turk Stat

On the other hand in the same period the raw materials also in the 3901 and 3902 HS groups (polyethylene and polypropylene) shared the biggest part of the total imports on value base. These raw materials shared 53 % of total plastics raw materials imports.

HS Code	Plastic raw material definitions	2015	2016/6	2016/E	% Increase 2016/ 2015 (E)
3901	Ethylene polymers (initial forms)	2,406	1,224	2,449	2
3902	Propylene and polymers of other olefins (initial forms)	2,650	1,199	2,398	-10
3903	Styrene polymers (initial forms)	795	384	768	-3
3904	Other olefin polymers with vinyl chloride/halogens	816	351	702	-14
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	100	58	116	17
3906	Acrylic polymers (initial forms)	370	157	313	-15
3907	Polyacetals, other polyether's, epoxide-alkyd resins (initial forms)	1,174	596	1,192	2
3908	Polyamides (initial forms)	213	112	225	6
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	447	216	433	-3
3910	Silicones (initial forms)	111	61	122	10
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	89	47	93	4
3912	Cellulose and chemical derivatives (initial form)	150	79	158	5
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	23	12	24	2
3914	Polymer based ion exchangers (initial form)	14	6	13	-12
3915	Wastes, residuals and scraps from plastic	36	27	55	53
	Plastic raw material total	9,396	4,530	9,060	-4

Table 15: Plastic Raw Material Imports on HS Basis (USD Million)

Source: Turk Stat

The dependency of Turkish plastics industry on plastic raw material supply is still continuing as 86 % in 2015.

3.3. PLASTIC RAW MATERIAL IMPORT BY COUNTRIES

Turkey imports plastics raw materials from over 100 countries. 10 countries comprised approximately 64 % on amount and 66 % on value bases of total imports in the first half of 2016.

In the first half of 2016, S. Arabia, S. Korea and Germany ranked as the top 3 country in total plastic raw material imports and these 3 countries received a total share of 33 % on amount and 34 % on value bases within our total national plastic raw material import in the first half of 2016.

2015					2016/6				
Countries	1000 Tons	USD Million	Ton-%	\$ - %	Countries	1000 Tons	USD Million	Ton-%	\$ - %
S. Arabia	977	1,309	16	14	S. Arabia	549	628	16	14
S.Korea	607	973	10	10	S.Korea	353	470	10	10
Germany	411	882	7	9	Germany	225	448	7	10
Belgium	383	606	6	7	Belgium	196	282	6	6
Iran	352	456	6	5	Italy	130	224	4	5
Italy	238	439	4	5	Iran	204	223	6	5
Spain	263	407	4	4	Spain	136	190	4	4
Netherlands	226	404	4	4	France	139	182	4	4
France	282	395	5	4	Netherlands	111	182	3	4
USA	218	310	4	3	Egypt	139	146	4	3
10 Countries	3,956	6,181	63	66	10 Countries	2,181	2,976	64	66
Others	2,313	3,215	37	34	Others	1,233	1,554	36	34
Total	6,269	9,396	100	100	Total	3,414	4,530	100	100

Table 16: Main Import Partners of Turkey for Plastics Raw Materials

Source: Turk Stat

3.4. PLASTIC RAW MATERIAL EXPORT

327 thousand tons and USD 400 million of plastic raw material was exported in the first half of 2016 and exports are expected to be 784 thousand tons and USD 959 million, increasing by 14 % on amount and 3 % on value base by the end of the year.

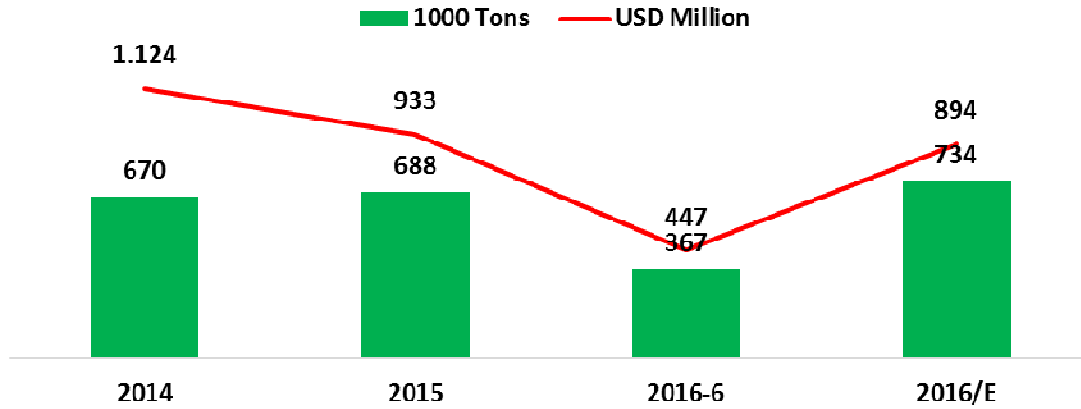


Figure 14: Plastics Raw Materials Exports

Source: Turk Stat

In the first half of 2016 the biggest part of total exports on unit base has been realized in polyacetals and acrylic polymers on amount and value bases.

HS Code	Plastic raw material definitions	2015	2016/ 6	2016/E	% Increase 2016/ 2015
3901	Ethylene polymers (initial forms)	35	16	31	-11
3902	Propylene and polymers of other olefins (initial forms)	28	14	29	2
3903	Styrene polymers (initial forms)	32	16	32	0
3904	Other olefin polymers with vinyl chloride/halogens	18	10	20	14
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	47	27	55	18
3906	Acrylic polymers (initial forms)	167	93	187	12
3907	Polyacetals, other polyethers, epoxide-alkyd resins (initial forms)	201	108	215	7
3908	Polyamides (initial forms)	13	7	15	12
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	77	42	84	9
3910	Silicones (initial forms)	6	3	6	-3
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	1	0	1	57
3912	Cellulose and chemical derivatives (initial form)	45	20	40	-10
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	0	0	0	-12
3914	Polymer based ion exchangers (initial form)	0	0	0	-12
3915	Wastes, residuals and scraps from plastic	18	9	18	2
	Plastic raw material total	688	367	734	7

Table 17: Plastic Raw Material Exports on HS Basis (1000 Tons)

Source: Turk Stat

HS Code	Plastic raw material definitions	2015	2016/ 6	2016/E	% Increase 2016/ 2015
3901	Ethylene polymers (initial forms)	52	21	42	-21
3902	Propylene and polymers of other olefins (initial forms)	39	18	36	-8
3903	Styrene polymers (initial forms)	42	18	36	-15

3904	Other olefin polymers with vinyl chloride/halogens	20	11	22	8
3905	Vinyl acetate/polymers of other vinyl esters (initial forms)	42	22	45	6
3906	Acrylic polymers (initial forms)	199	98	196	-1
3907	Polyacetals, other polyether's, epoxide-alkyd resins (initial forms)	330	162	323	-2
3908	Polyamides (initial forms)	26	13	26	-1
3909	Amino resins, phenolic resins, polyurethanes (initial forms)	91	43	87	-5
3910	Silicones (initial forms)	20	10	21	3
3911	Petroleum resins, coumarone, indene/coumarone-indene resin, polyterpenes	2	1	2	17
3912	Cellulose and chemical derivatives (initial form)	52	22	44	-14
3913	Natural polymers, modified natural polymers, derivatives (initial forms)	1	0	1	-27
3914	Polymer based ion exchangers (initial form)	0	0	0	-42
3915	Wastes, residuals and scraps from plastic	16	7	14	-16
	Plastic raw material total	933	447	894	-4

Table 18: Plastic Raw Material Exports on HS Basis (USD Million)

Source: Turk Stat

3.5. PLASTIC RAW MATERIAL EXPORTS BY COUNTRIES

Turkey exports plastic raw material to over 100 countries and 10 countries received a share of 52 % both on amount and value basis within total export in the first half of 2016.

Italy, Germany, Egypt, Iran and Bulgaria ranked as the top 5 countries in plastics raw material exports in this period on unit and value base.

2015					2016/6				
Countries	1000 Tons	USD Million	% - Ton	% - \$	Countries	1000 Tons	USD Million	% - Ton	% - \$
Germany	66	93	10	10	Italy	39	50	10	10
Egypt	61	66	9	7	Germany	34	46	9	9
Russian Fed.	31	63	5	7	Egypt	29	28	7	6
Iran	21	47	3	5	Iran	12	25	3	5
Italy	37	46	5	5	Bulgaria	27	20	7	4
Bulgaria	52	39	7	4	Russian Fed.	10	18	2	4
Israel	25	29	4	3	Greece	22	18	6	4
Romania	22	28	3	3	Spain	13	16	3	3
Iraq	18	28	3	3	Israel	15	15	4	3
Uzbekistan	13	27	2	3	Uzbekistan	8	13	2	3
10 Countries	345	466	50	50	10 Countries	210	250	52	51
Others	343	467	50	50	Others	191	241	48	49
Total	688	933	100	100	Total	400	491	100	100

Table 19: Plastics Raw Materials Exports by Countries

Source: Turk Stat

3.6. PLASTIC RAW MATERIAL FOREIGN TRADE UNIT PRICES

Plastic raw material average unit import price in the first half of 2016, was 1.33 USD/kg and displayed a decrease of 9 % with respect to 2015 averages.

In the same period, plastic raw material average unit export price was 1.22 USD/kg and displayed a decrease by 26 % with respect to 2015 averages.

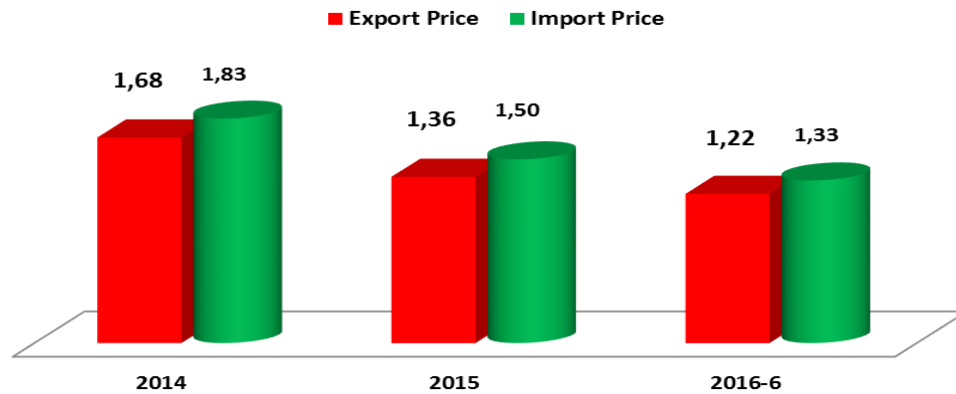


Figure 15: Plastics Raw Materials Foreign Trade Prices (USD/kg)

Turkey's plastic raw material unit prices are approximately 8 % higher than export prices. In other words, while Turkey is importing plastic raw materials with high added values, she exports with low ones.

HS Code	Import Prices			Export Prices		
	2015	2016/6	% Increase	2015	2016/6	% Increase
3901	1,50	1,38	-8	1,48	1,32	-11
3902	1,36	1,14	-16	1,38	1,23	-10
3903	1,55	1,37	-12	1,31	1,12	-15
3904	0,98	0,89	-9	1,15	1,09	-5
3905	2,36	2,36	0	0,90	0,81	-10
3906	1,87	1,48	-21	1,19	1,05	-12
3907	1,87	1,65	-12	1,64	1,50	-9
3908	2,45	2,29	-6	1,98	1,75	-11
3909	2,06	1,87	-9	1,18	1,03	-13
3910	3,74	3,72	-1	3,18	3,37	6
3911	3,13	2,84	-9	3,95	2,94	-26
3912	3,91	3,87	-1	1,16	1,10	-5
3913	7,64	6,22	-19	6,12	5,07	-17
3914	2,45	2,32	-5	3,09	2,05	-34
3915	0,34	0,33	-4	0,89	0,73	-18
Average	1,50	1,33	-11	1,36	1,22	-10

Table 20: Plastic Raw Materials Export and Import Average Unit Prices (USD/kg)

Source: Turk Stat

3.7. PLASTICS RAW MATERIALS FOREIGN TRADE DEFICIT

Turkey is a country that always gives foreign trade deficit in plastic raw materials trade. Foreign trade deficit for plastics raw materials in the first half of 2016 stood at 3 million 47 thousand tons and USD billion 4 and 83 million. By the end of 2016 foreign trade deficit is estimated to be 6 million 94 thousand tons and USD billion of 8,2.

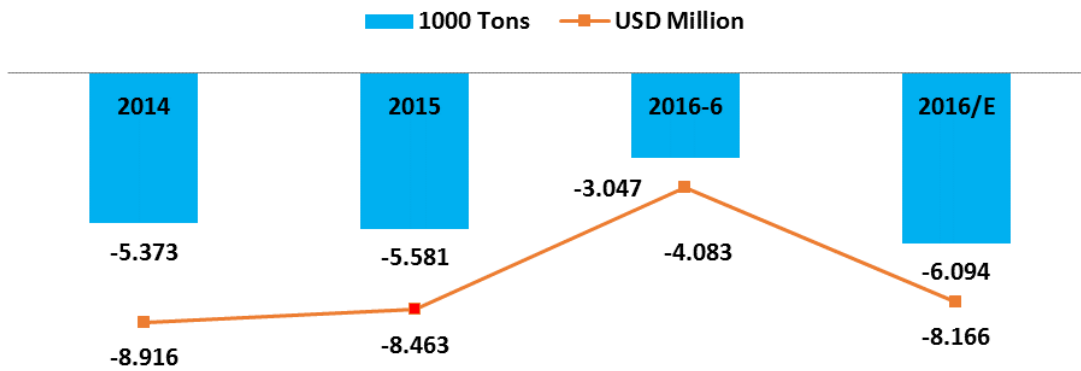


Figure 16: Plastics Raw Materials Foreign Trade Deficit

3.8. PLASTICS RAW MATERIALS DOMESTIC CONSUMPTION

Plastics raw materials domestic consumption realized as 3 million 600 thousand tons in the first half of 2016 and expected to be 7 million 100 thousand tons increasing by 8 % compared with 2015.

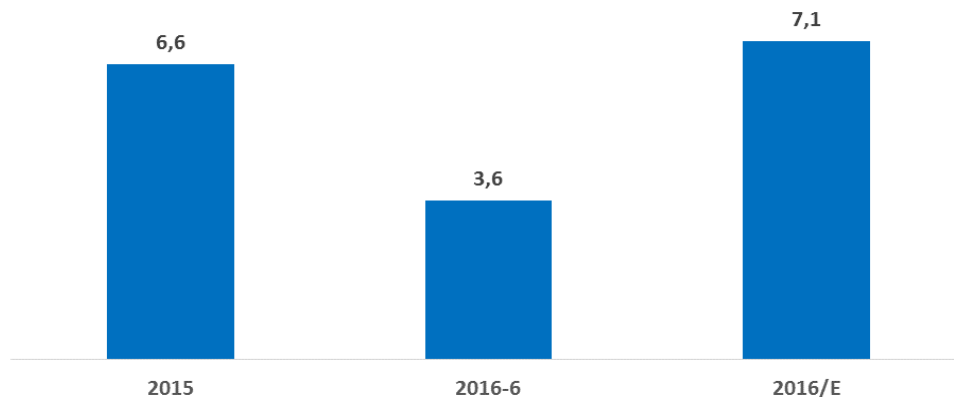


Figure 17: Plastics Raw Materials Domestic Consumption (Million Tons)

3.9. PLASTIC RAW MATERIAL GENERAL SUPPLY AND DEMAND EQUILIBRIUM EXPECTATIONS FOR 2016

Regarding realizations in the first 6 months, plastics raw materials expectations for 2016 are as follows;

- ✓ Domestic production will preserve the 2015 levels,
- ✓ Import will increase to 6,83 million tons increasing 9 %
- ✓ Exports will increase 734 thousand tons increasing by 14 %
- ✓ Domestic consumption will increase to 7,01 million Tons increasing by 8 %,
- ✓ Foreign trade deficit will increase to 6,1 million Tons,
- ✓ The share of imports within total supply will be 87 %,
- ✓ The export-import coverage ratio will be 11 %.

	2015	2016/6	2016 (E)	% Increase 2016/2015
Production	1,014	507	1,014	0
Import	6,269	3,414	6,828	9
Export	688	367	734	7
Domestic Consumption	6,595	3,554	7,108	8
Foreign Trade Deficit / Surplus	-5,581	-3,047	-6,094	
Export / Manufacturing (%)	68	72	72	
Import / Domestic Consumption (%)	86	87	87	
Export / Import (%)	11	11	11	

Table 21: Supply and Demand Equilibrium in Plastic Raw Materials (1000 Tons)

4. CONCLUSION

Turkish plastics industry is considered as an importer sector while foreign trade and its contribution to the national economy are calculating. The main reason for that, plastic raw materials imported by the petrochemical industry is considered as the import of the plastics industry and the plastics industry is considered as the sector giving huge foreign trade deficit, although gives surplus. This situation creates a negative perception for the sector. Plastic raw materials which are used to produce plastics end products are completely produced by the petrochemical sector. Therefore, plastics raw materials foreign trade must be located in the petrochemical sector's records

The main problem arises due to the perception of considering plastics end product and polymer industries are the same sectors. However, iron and steel are raw materials while plastics are semi or finished products such as water pipe, automobiles, refrigerators, food packaging.



Plastic end products industry has exported approximately 18 % of the total production on amount base for the last 2 years. The total export value of USD 5 billion in 2014 declined to USD 4,4 billion in 2015 due to the decline in unit export prices. On the other hand, it is expected to increase to 1 million 568 thousand tons and USD 4 billion and 226 million by the end of 2016, staying with the same amount but decreasing by 4 % on value base with respect to 2015.

However, Turkey exports at least 50 % of plastics end products production when indirect exports realized by automotive, food packaging and other exporter industries are taken into account.

So, with direct and indirect exports, Turkish plastics industry gives about USD 15 billion foreign trade surplus.

Turkish plastics industry is considered as one of the biggest importer industries by the government, since the imports of polymers are involved in the plastics industry import records.

In nowadays, these days, the largest parts of engines, steel and main parts and components are imported for the motor vehicles production in automotive industry which is the main exporting sector. But these kind of imports are not included in the foreign trade of automotive industry. Plastics industry meets large amount of raw materials by imports like automotive sector.

From this point of view, it is seen that the calculation of the foreign trade surplus / deficit for other sectors are not realized for plastics industry and due to the insufficient production of polymers, huge imports of raw materials are included in plastics industry trade records, and this creates unfair negative perception for the plastics industry.

However, there is also very much difference between the value added of the polymer and plastics industry since the average unit export price of plastics end products is about USD 3/ kg while it is USD 1/Kg for polymers.

Entrepreneurial, design, innovation, employment and profitability nature of the companies operating in plastics industry differs from those operating in polymer sector. Indeed, researches conducted in many countries, employment is created only 2 by petrochemical industry in response to the 15 employment created by plastics industry.

Oil and polymer rich Middle Eastern countries want to take the main plastics end product producer countries, including Turkey, to their own countries from all over the World by attractive incentives, since they could not create jobs and added value at their countries. Therefore, we believe that we should get rid of that negative perception. Because of these negative perception, taxes are increased for the raw materials which are not feasible to



produce due to lack of oil production. Import duties and protection measures are taken to those raw materials which are introduced as the strategic production. Today, especially in European polymers companies left to produce these products or shifted the production to the Middle Eastern countries.

High import tax problem of the Turkish plastics industry remained unchanged in 2015. The important thing is to produce high value-added raw materials in Turkey. The raw materials such as polypropylene and polyethylene, which the industry cannot meet the needs from the domestic production, pay taxes when importing raw materials and this adversely affects our competition. When these drawbacks of the added value provided by our industry are eliminated, the industry will add more to the national economy.

Turkish plastics industry grows rapidly and share more in global plastics industry. The 2023 export vision of the industry is to accrue at least 17 billion dollars of the 50 billion dollar export target of the chemical industry. In order for to increase the current export prices plastics industry export, which is less than 6 billion dollars, to 17 billion dollars, the industry must export 6 million tons of product and escalate total manufacturing to 28 million tons by 2023 with an annual growth of 14 % in order to meet domestic demand.

On the other hand, it is known that the aforementioned export target is also possible through export of 3.8 million tons of product by increasing the unit export prices to 4.5 \$/kg. In this case, manufacturing must reach to a level of 18 million tons by 2023 with an annual growth of 9 %.

Under current circumstances, attainment of 17 billion dollars of export seems extremely difficult. However, the realisation of export on such levels, in parallel with its growth, the industry must take measures which will increase its unit export prices, which cruises around 3 \$/kg to 4,5 \$/kg, average of developed countries alongside with making the best of the investment incentives.

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.

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.