



**TURKISH PLASTICS PROCESSING
MACHINERIES INDUSTRY REPORT
2016**

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EXECUTIVE SUMMARY

Turkey is a country which imports about 60 - 80 % of plastic processing machines, parts and accessories, is a net importer in these products and can not provide sufficient added value with low export prices compared to developed western societies. As the plastics industry is growing rapidly, the production of plastic processing machines does not develop parallel to this pace and the sector can not develop against imports made from cheap machine-maker countries, especially from China. The lack of a state strategy for the plastics processing machinery industry and the inadequate protection of the domestic producers cause the production of plastic processing machines in Turkey not to improve sufficiently.

Annual machinery investment of Turkish Plastics Industry realized as USD 821 million for the last 5 years between 2011 - 2015 period. In this period, investments of presses and other machines constituted 36 % of total investments while injection machines 23 %, extrusion machines 19 %, thermoforms 5 %, blow molding 3 %, parts and components 15 %.

In January - November period of 2016, 403 million dollars of production, 518 million dollars of imports, 132 million dollars of exports and 789 million dollars of domestic market sales (machinery and equipment investment of plastics industry) have been realized in plastic processing machines and their parts and components industry.

During this period, the sector gave 386 million dollars of foreign trade deficit, 66 % of the domestic sales (machinery and equipment investment of the industry) was covered by imports and the import coverage ratio of exports realized as 25 %.

By the end of 2016, it is estimated that the production will be 440 million dollars, imports 565 million dollars, exports 144 million dollars and domestic sales (machinery and equipment investment of plastics industry) 861 million dollars.

In order for the Turkish plastics processing machinery sector to produce and export more value-added machines, the main strategies are as described in the Machinery Sector Export Strategy Document. General Purpose: "Improvement of Machinery Industry and Ensure the Manufacture of High-Tech Products".

1. WORLD PLASTIC PROCESSING MACHINERY INDUSTRY

It is estimated that in 2015, total production will reach to 74 billion dollars and total foreign trade volume to 54 billion dollars in global plastics processing industry .

The world's plastic processing machines constitute the three largest importers China, USA and Germany. The share of these 3 countries in total world imports is 30 %. It is seen that Turkey has a share of 2 % of the total imports of plastic processing machines in the world.

Germany, China and Italy are the top 3 exporting countries in the world plastic processing machines and these countries account for 44 % of total exports. Turkey has a share of less than 1 % of total world exports.

30 % of total foreign trade volume of plastic processing machines constitute presses and other machines, 26 % parts and components, 24 % injection, 11 % extruder, 6 % blow molding and 3 % thermoforming machines .

The world plastics industry is estimated to invest USD 73 billion in machinery and equipment in 2015. 39 % of the machinery and equipment investments realised in the world plastics sector in 2015 were made by parts and accessories, 27 % by presses and other machines, 18 % by injection machines, 8 % by extrusion, 5 % by blow molding and 3 % thermoforming machines.

2. TURKISH PLASTICS PROCESSING MACHINERIES INDUSTRY

2.1. PRODUCTION

In the January - November period of 2016, the production of plastic processing machines parts and accessories realized as 403 million dollars. It is estimated that the production will be 440 million dollars at the end of 2016 increasing by 12 % compared to 2015.

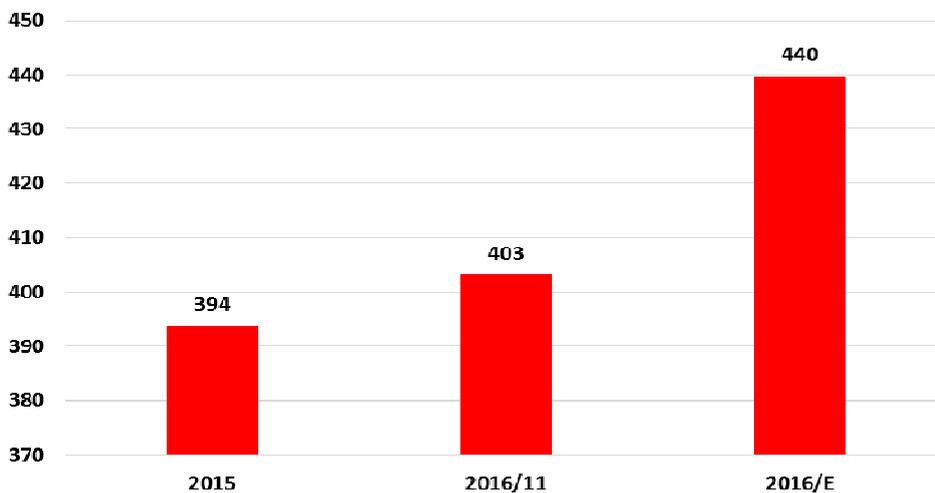


Figure 1: Plastics Processing Machines Production (USD Million)

Considering the January - November period of 2016, production at the end of the year is expected to increase substantially in all items except for the blow molding machines and presses.

Machineries	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Injection Machinery	16	21	23	42
Extrusion Machinery	61	64	70	15
Blow Molding Machinery	1	1	1	-33
Thermoform Machinery	30	43	46	53
Presses and Other Machinery	162	138	150	-7
Parts and Components	123	137	150	22
Total	394	403	440	12

Table 1: Plastics Processing Machines Production (USD Million)

In this period, injection machines accounted for 5 % total production, extrusion machines 16 %, thermoforming machines 11 %, presses and other machines 34 %, parts and components 34 % of total plastics processing machines production. The share of blow molding machines in total production is less than 1 %.

Machineries	2015	2016/11
Injection Machinery	4	5
Extrusion Machinery	15	16
Blow Molding Machinery	-	-
Thermoform Machinery	8	11
Presses and Other Machinery	41	34
Parts and Components	31	34
Total	100	100

Table 2: Shares of Machineries in Total Production (%)

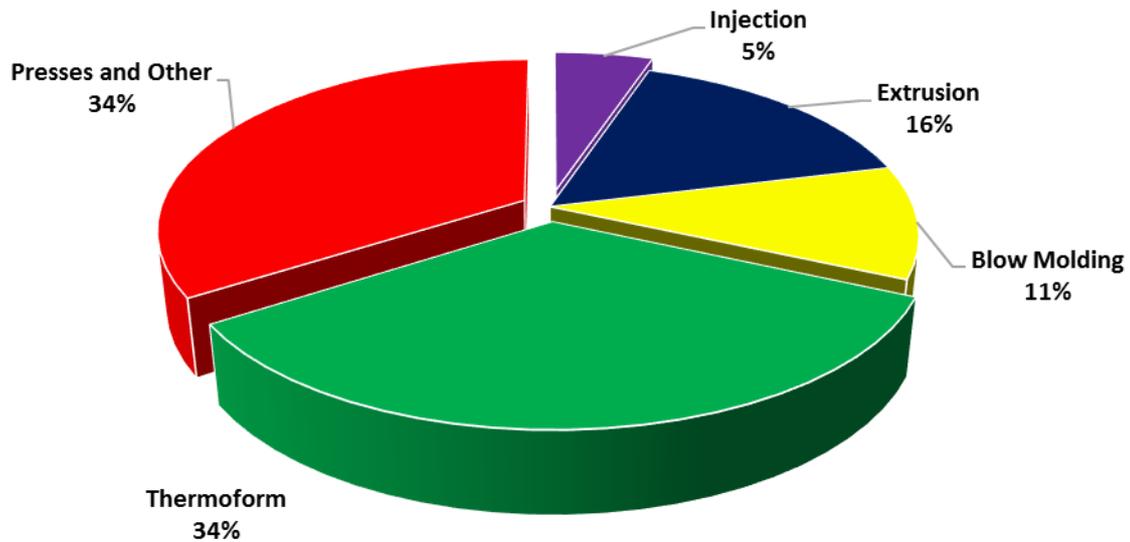


Figure 2: Shares of Machineries in Total Production (2016/11)

2.2. IMPORTS

In January - November period of 2016, imports of plastics processing machinery and their parts and components realized as 518 million dollars. It is expected that imports will increase to 565 million dollars at the end of the year increasing by 2 % compared to 2015.

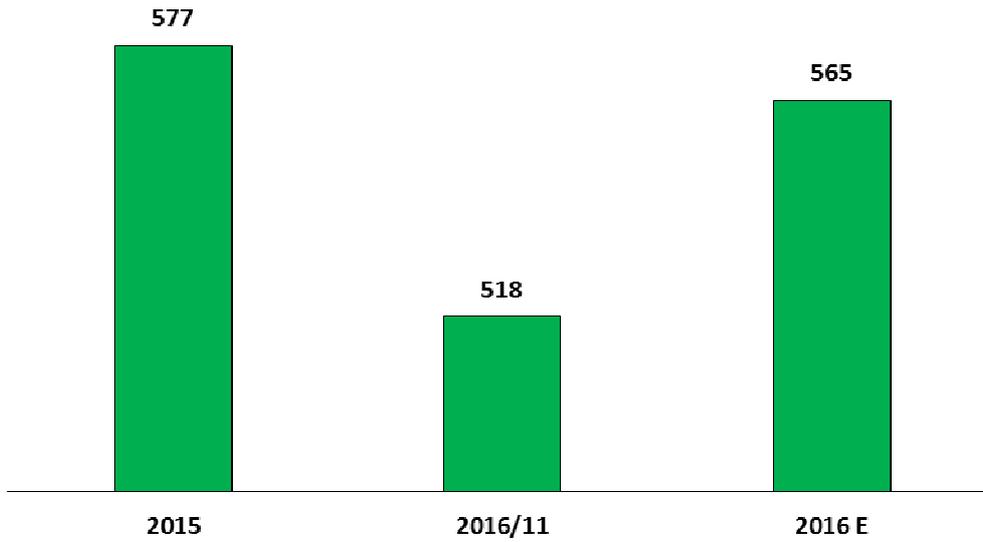


Figure 3: Plastics Processing Machineries Imports (USD Million)

Source: TurkStat

At the end of 2016, it is estimated that imports of all machineries, except extruders, blow molding and thermoforming machines will decline compared to 2015.

Machineries	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Injection Machinery	192	154	168	-12
Extrusion Machinery	111	104	113	2
Blow Molding Machinery	17	20	22	26
Thermoform Machinery	9	14	15	63
Presses and Other Machinery	204	190	207	1
Parts and Components	42	36	40	-7
Total	577	518	565	-2

Table 3: Plastics Processing Machineries and Parts and Components Imports (USD Million)

Source: TurkStat

In the January - November period of 2016, injection machines received 30 %, extrusion machines 20 %, blow molding machines 4 %, thermoforming machines 3 %, presses and other machines 36 %, parts and components 7 % of total imports.

Machineries	2015	2016/11
Injection Machinery	33	30
Extrusion Machinery	19	20
Blow Molding Machinery	3	4
Thermoform Machinery	2	3
Presses and Other Machinery	35	36
Parts and Components	8	7
Total	100	100

Table 4: Share of Machineries in Total Imports (USD Million - %)

Source: TurkStat

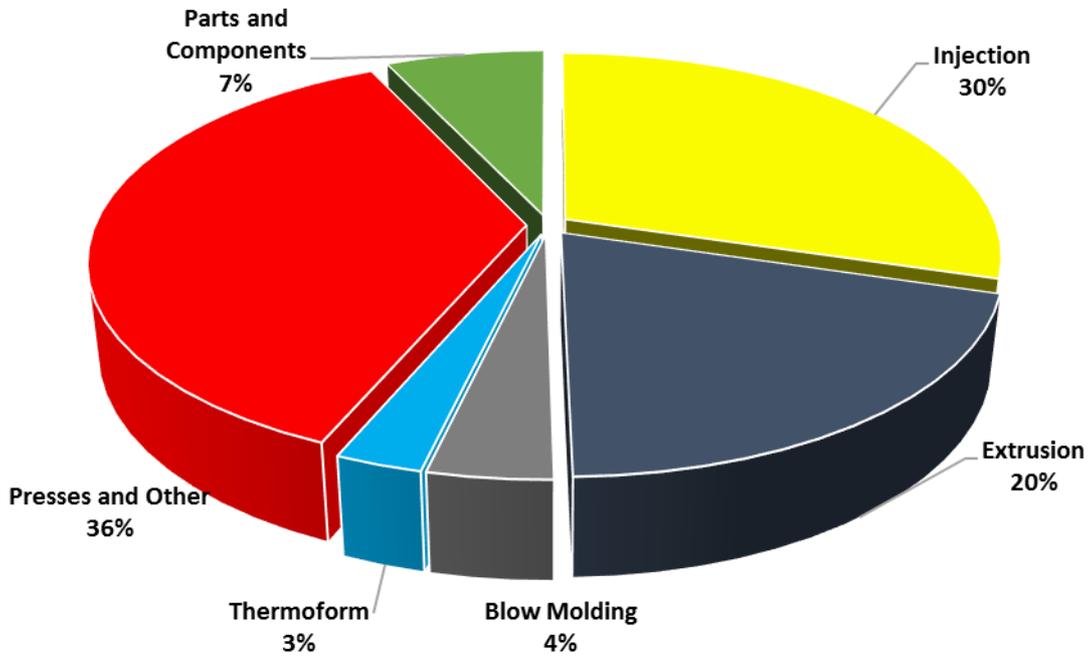


Figure 4: Share of Machineries in Total Imports (2016/11)

Source: TurkStat

2.3. EXPORTS

In the January - November period of 2016, exports of plastics processing machinery and their parts and accessories realized as 132 million dollars and it is estimated that exports will be 144 million dollars at the end of 2016 increasing by 10 % compared to 2015.

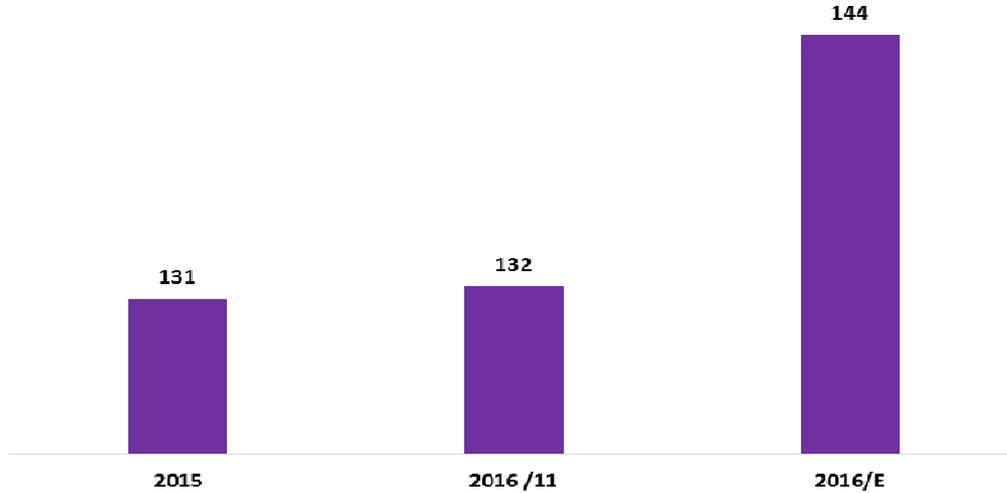


Figure 5: Plastics Processing Machineries Exports (USD Million)

Source: TurkStat

During this period, exports increased for all machineries except blow molding, presses and other machines.

Machineries	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Injection Machinery	8	10.3	11.3	42
Extrusion Machinery	30	32.1	35.0	15
Blow Molding Machinery	1	0.3	0.4	-33
Thermoform Machinery	12	17.0	18.6	53
Presses and Other Machinery	65	51.2	55.9	-8
Parts and Components	15	21.0	22.9	18
Total	131	132.0	144.0	10

Table 5: Plastics Processing Machineries and Part and Components (USD Million)

Source: TurkStat

In the period of January - November of 2016, injection machines received 8 %, extrusion machines 24 %, thermoforming machines 13 %, presses and other machines 39 % and their parts and components 16 % share in total exports. The share of blowing machines realised less than 1 %.

Machineries	2015	2016/11
Injection Machinery	6	8
Extrusion Machinery	23	24
Blow Molding Machinery	-	-
Thermoform Machinery	9	13
Presses and Other Machinery	49	39
Parts and Components	12	16
Total	100	100

Table 6: Share of Machineries in Total Exports (USD Million - %)

Source: TurkStat

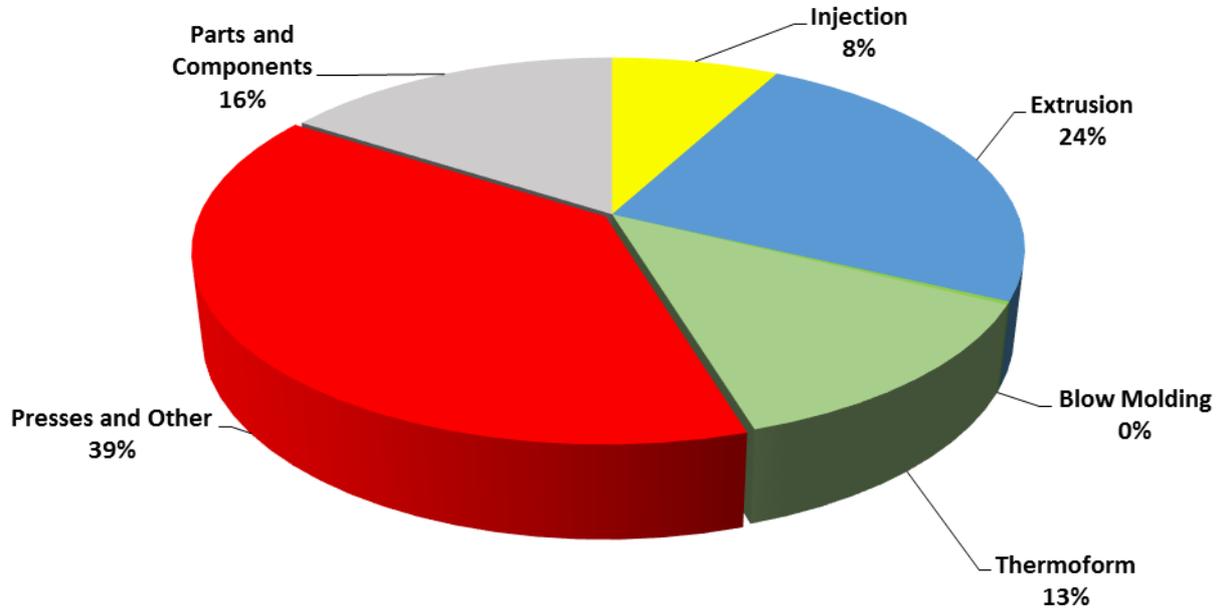


Figure 6: Share of Machineries in Total Exports (2016/11)

Source: TurkStat

2.4. 10 MAIN EXPORT MARKETS FOR PLASTICS PROCESSING MACHINES

In the January - November period of 2016, plastic processing machines and their parts and components imported from 10 countries accounted for 92 % on value basis. During this period, the first 3 countries from which imports realised most are China, Germany and Italy. The share of these 3 countries in total imports is 64 % on value basis.

On the other hand, in January - November of 2016, exports of plastic processing machines and parts and accessories made from 10 countries accounted for 42 % of total exports on value basis. During the January - November period of 2016, the first 3 export markets for plastics processing machines are Iran, Russia and Germany. The share of these 3 countries in our total exports is 20 % on value basis.

Imports			Exports		
Countries	USD Million	% - Share	Countries	USD Million	% - Share
China	137	26	Iran	11	9
Germany	100	19	Russian Fed.	8	6
Italy	97	19	Germany	6	5
Japan	42	8	Algeria	6	5
Austria	28	5	Bulgaria	4	3
Taiwan	27	5	S. Arabia	4	3
S. Korea	12	2	Ukrain	4	3
Sweetzerland	11	2	Netherlands	4	3
U.K.	11	2	Romain	4	3
USA	9	2	USA	3	3

Total 10 Countries	474	92	Total 10 Countries	56	42
Others	44	8	Others	76	58
Total	518	100	Total	132	100

Table 7: The First 10 Countries for Plastics Processing Machines Imports and Exports (2016/11)

Source: TurkStat

2.5. AVERAGE UNIT FOREIGN TRADE PRICES

The average unit import price of plastics processing machines and their parts and accessories realized as 12.1 \$/kg in January - November period of 2016 increasing by 6 % compared to 2015. In this period, the average unit import prices for the extruder and thermoform machines increased while the others decreased.

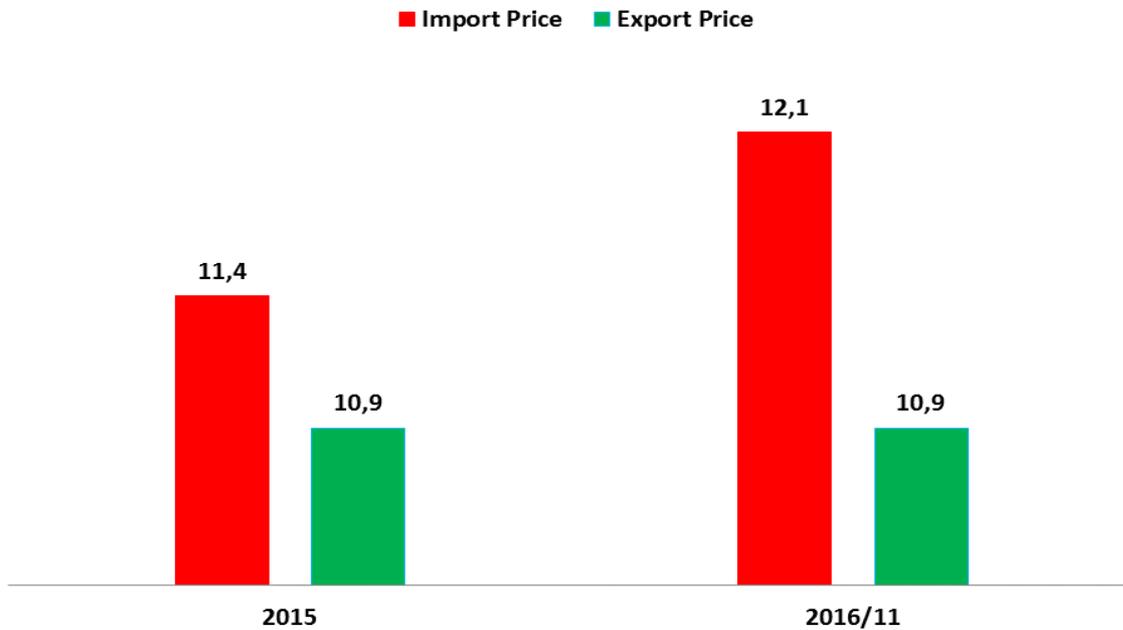


Figure 7: Unit Import and Export Prices for Machineries (\$/kg)

Source: TurkStat

Machineries	2015	2016/11	% Increase
Injection Machinery	6.8	6.5	-5
Extrusion Machinery	14.1	20.0	42
Blow Molding Machinery	24.2	21.1	-13
Thermoform Machinery	11.4	15.6	37
Presses and Other Machinery	17.5	17.4	0
Parts and Components	41.0	39.2	-4
Total	11.4	12.1	6

Table 8: Unit Import Prices for Machineries (\$/kg)

Source: TurkStat

The average unit export price of plastics processing machines and their parts and accessories realized as 10.9 \$/kg in January - November period of 2016 and remained at the same level

compared to 2015. During this period, the average export unit prices increased for others except blow molding, thermoforming, presses and other machines.

Machineries	2015	2016/11	% Increase
Injection Machinery	4.4	4.7	8
Extrusion Machinery	12.8	14.2	11
Blow Molding Machinery	14.0	6.5	-54
Thermoform Machinery	20.4	19.1	-7
Presses and Other Machinery	12.4	9.4	-24
Parts and Components	7.6	18.6	147
Total	10.9	10.9	-

Table 9: Unit Export Prices For Machineries (\$/kg)

Source: TurkStat

In this period, the average export unit prices realized about 10 % below the average import prices.

2.6. FOREIGN TRADE DEFICIT

Turkey, always gives deficit in plastics processing machines foreign trade. In 2011, foreign trade deficit reached the highest level with 589 million dollars. Foreign trade deficit realized as 386 million dollars in January – November period of 2016 and it is estimated to be 421 million dollars at the end of year. Foreign trade deficit is expected to decline by 6 % in 2016 compared to 2015.

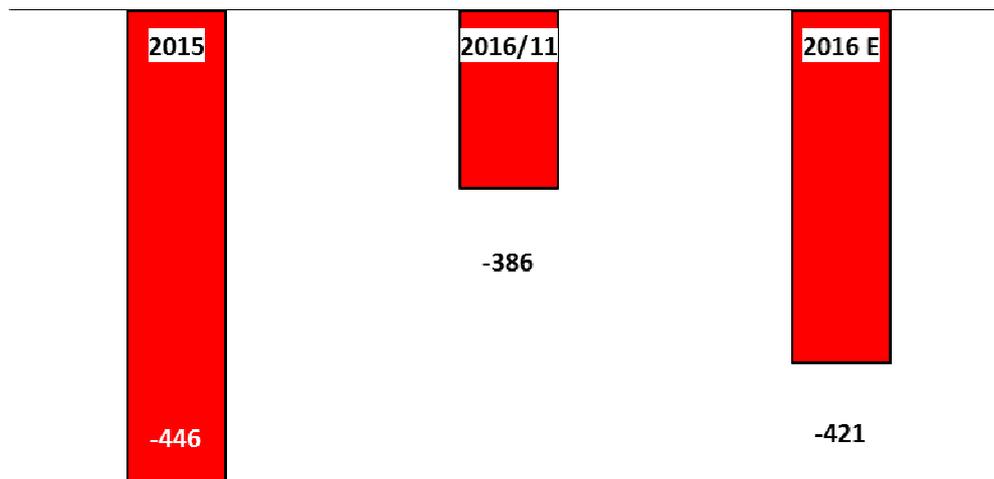


Figure 8: Plastics Processing Macines Foreign Trade Deficit (USD Million)

Source: TurkStat

At the end of 2016, foreign trade deficit for blow molding, thermoforming, presses and other machinery will increase while others will decrease compare to 2015.

Machineries	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Injection Machinery	-184	-143	-156	-15
Extrusion Machinery	-81	-72	-78	-3
Blow Molding Machinery	-17	-20	-22	28
Thermoform Machinery	3	3	3	17
Presses and Other Machinery	-140	-135	-147	5
Parts and Components	-27	-19	-21	-23
Total	-446	-386	-421	-6

Table 10: Plastics Processing Machines Foreign Trade Deficit (USD Million)

Source: TurkStat

2.7. DOMESTIC MARKET SALES (MACHINES AND EQUIPMENTS INVESTMENT OF PLASTICS INDUSTRY)

Machinery and equipment investments in the plastics industry have fallen after reaching the highest level in 2011 with \$ 885 million. Domestic market sales were \$ 789 million in January - November 2016 and investments are expected to rise to \$ 861 million by the end of 2016 decreasing by 3 % compared to 2015.

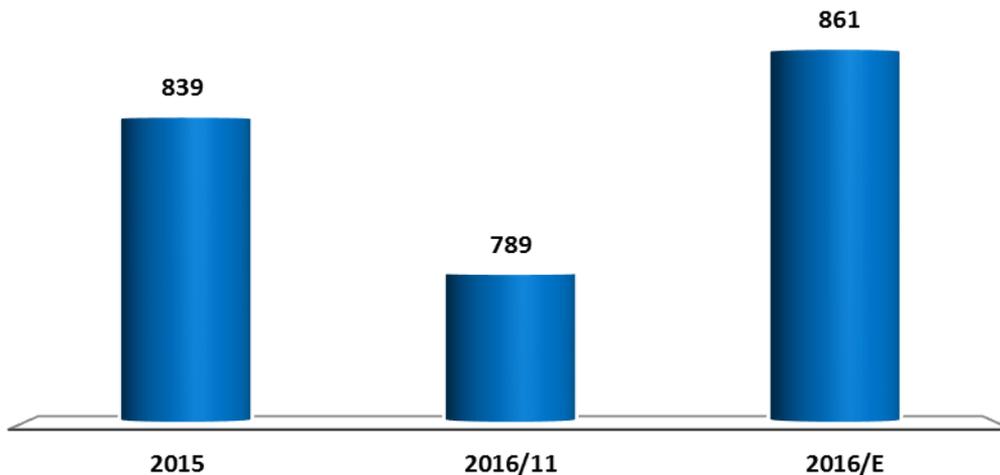


Figure 9: Plastics Processing Machines Domestic Sales (USD Million)

At the end of 2016, investments are expected to increase for all machines except for injection machines, presses and other machine compared to 2015.

Machineries	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Injection Machinery	200	164	179	-10
Extrusion Machinery	142	136	148	4
Blow Molding Machinery	18	21	23	23
Thermoform Machinery	28	40	43	56
Presses and Other Machinery	302	272	297	-2
Parts and Components	150	156	170	14
Total	839	789	861	3

Table 11: Plastics Processing Machines Domestic Sales (USD Million)

Source: TurkStat

In the January - November period of the year 2016, 34 % of the total machinery investments of the plastics industry accounted by presses and other machines. Injection machines shared 21 % while extrusion machines 17 %, blow molding machines 3 %, thermoforming machines 5 %, parts and components 19 %.

Machineries	2015	2016/11
Injection Machinery	24	21
Extrusion Machinery	17	17
Blow Molding Machinery	2	3
Thermoform Machinery	3	5
Presses and Other Machinery	36	35
Parts and Components	18	19
Total	100	100

Table 12: Share of Machines in Total Domestic Sales (% - USD Million)

Source: TurkStat

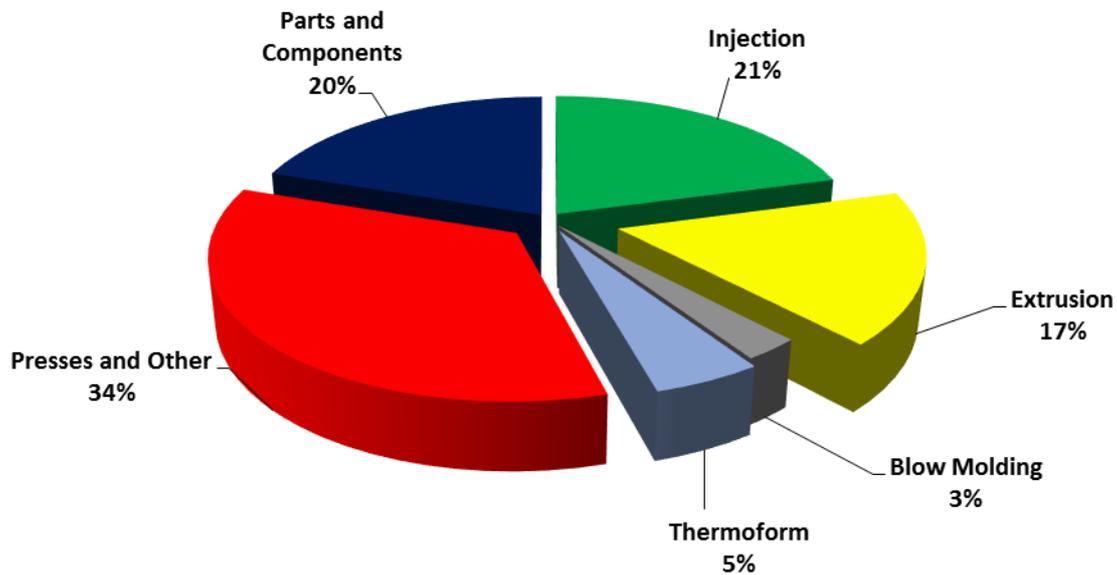


Figure 10: Share of Macineries in Total Machinery Investments of Plastics Industry

Annual machinery investment of Turkish Plastics Industry realized as USD 821 million for the last 5 years between 2011-2015 period. In this period, investments of presses and other machines constituted 36 % of total investments while injection machines 23 %, extrusion machines 19 %, thermoforms 5 %, blow molding 3 %, parts and components 15 %

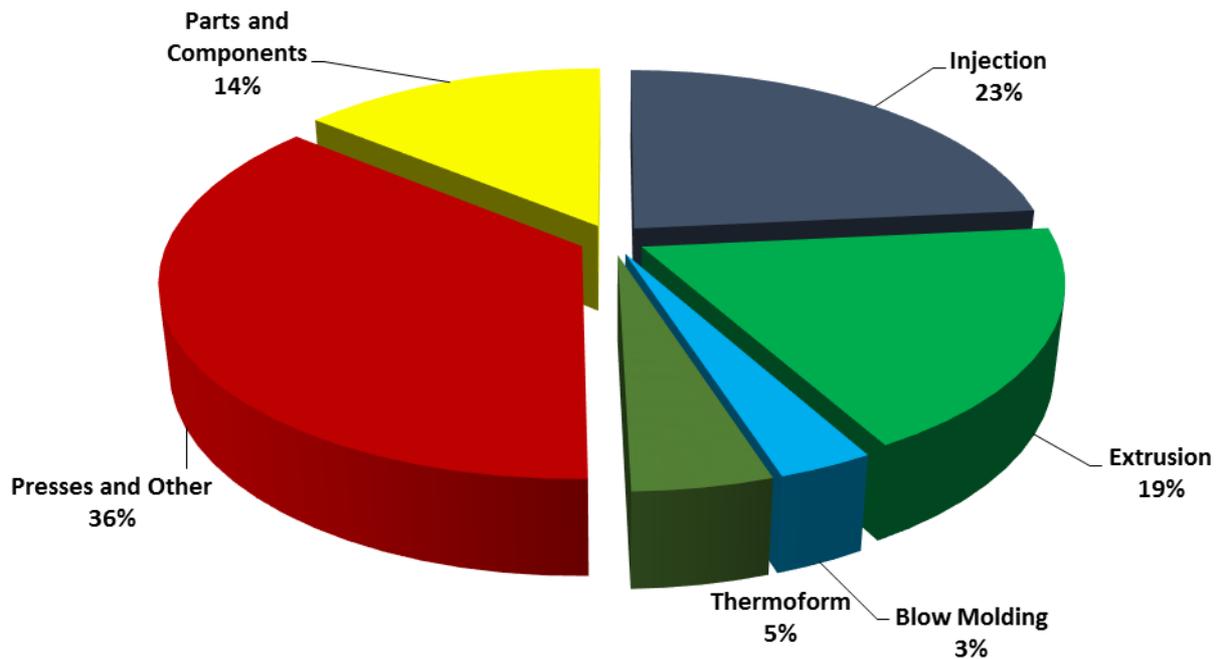


Figure 11: Breakdown of Machinery Investments of Plastics Industry for the Last 5 Years

Source: TurkStat

3. SUPPLY AND DEMAND EQUILIBRIUMS

3.1. TOTAL PLASTICS PROCESSING INDUSTRY

In January - November period of 2016, 403 million dollars of production, 518 million dollars of imports, 132 million dollars of exports and 789 million dollars of domestic market sales (machinery and equipment investment of plastic industry) have been realized in plastic processing machines and their parts and components industry.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	394	403	440	12
Imports	577	518	565	-2
Exports	131	132	144	10
Domestic Sales	839	789	861	3
Foreign Trade Deficit	-446	-386	-421	-6
Importst / Domestic Sales (%)	69	66	66	
Exports /Imports (%)	23	25	25	

Table 13: Plastics Processing Machines Supply & Demand Balance (USD Million)

Source: TurkStat

During this period, the sector gave 386 million dollars of foreign trade deficit, 66 % of the domestic sales (machinery and equipment investment of the industry) was covered by imports and the import coverage ratio of exports realized as 25 %.

By the end of 2016, it is estimated that the production will be 440 million dollars, imports 565 million dollars, exports 144 million dollars and domestic sales (machinery and equipment investment of plastics industry) 861 million dollars.

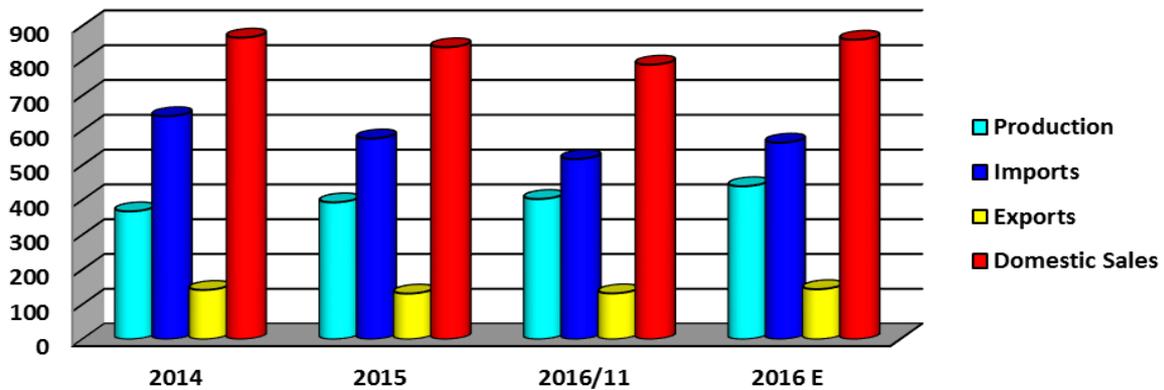


Figure 12: Plastics Processing Machines Supply & Demand Balance (USD Million)

3.2. SUPPLY & DEMAND BALANCE IN INJECTION MACHINES

In January - November period of 2016, 21 million dollars of production, 154 million dollars of imports, 10 million dollars of exports and 164 million dollars of domestic sales have been realised in the injection machines industry. In this period, foreign trade deficit for injection machines realised as 143 million dollars.

In this period, it is seen that 94 % of the domestic sales of the plastic injection machines (injection machines investment of the industry) are covered by imports and the ratio of export coverage of imports is 7 %.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	16	21	23	42
Imports	192	154	168	-12
Exports	8	10	11	42
Domestic Sales	200	164	179	-10
Foreign Trade Deficit	-184	-143	-156	-15
Importst / Domestic Sales (%)	96	94	94	
Exports /Imports (%)	4	7	7	

Table 14: Supply & Demand Balance in Injection Machines (USD Million)

Source: TurkStat

At the end of 2016 in plastic injection machines industry; production is expected to be 23 million dollars, imports 168 million dollars, exports 11 million dollars, domestic sales (injection machinery investment of plastics industry) 179 million dollars and foreign trade deficit 156 million dollars.

In the January - November period of 2016, plastic injection machines imported from 10 countries accounted for 98 % of total imports on value basis. China received 48 % of total imports. Following China, Germany, Japan, Austria and Taiwan are the main import markets for plastics injection machines.

In the same period, 58 % of plastic injection machines were exported to 10 countries while Ethiopia, Jordan and Iran constituted the first 3 major export markets for plastic injection machines

Imports			Exports		
Countries	USD Million	% - Share	Countries	USD Million	% - Share
China	74	48	Etiophia	1.1	11
Germany	24	15	Jordan	0.8	8
Japan	14	9	Iran	0.8	7
Austria	12	7	Algeria	0.7	7
Taiwan	7	5	Bulgaria	0.6	6
S. Korea	7	5	Kazakhstan	0.5	4
Italy	6	4	Romain	0.4	4
Sweetzerland	3	2	Russian Fed.	0.4	4
Canada	3	2	Iraq	0.4	4
Slovenia	1	1	Sudan	0.3	3
Total 10 Countries	151	98	Total 10 Countries	6.0	58
Others	2	2	Others	4.3	42
Total	154	100	Total	10.3	100

Table 15: Plastics Injection Machines Imports & Exports by Countries (2016/11)

Source: TurkStat

3.3. SUPPLY & DEMAND BALANCE IN EXTRUSION MACHINES

In January - November period of 2016, in the plastics extrusion machines industry; production realised as 64 million dollars, imports 104 million dollars, exports 32 million dollars and domestic market sales 136 million dollars. On the other hand, the foreign trade deficit is 72 million dollars in the same period.

In this period, 76 % of domestic sales (extrusion machines investment of plastics industry) of plastic extrusion machines were covered by imports and the import coverage ratio of exports realised as 31 %.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	61	64	70	15
Imports	111	104	113	2
Exports	30	32	35	15
Domestic Sales	142	136	148	4
Foreign Trade Deficit	-81	-72	-78	-3
Importst / Domestic Sales (%)	79	76	76	
Exports /Imports (%)	27	31	31	

Table 16: Supply & Demand Balance in Extrusion Machines (USD Million)

Source: TurkStat

At the end of 2016, in the plastics extruder machines industry; production is expected to reach to 70 million dollars, imports 113 million dollars, exports 35 million dollars, domestic sales (extrusion machine investment of plastics industry) 148 million dollars and 78 million dollars foreign trade deficit.

In the January - November period of 2016, plastic extrusion machines imports from 10 countries accounted for 96 % of the total imports on value basis. In this period, Germany, China and Italy received 65 % of total imports.

In the same period, 62 % of plastic extrusion machines were exported to 10 countries while Russia, Algeria and Iran made our first 3 major export markets for plastic extrusion emachines.

Imports			Exports		
Countries	USD Million	% - Share	Countries	USD Million	% - Share
Germany	28	27	Russian Fed.	5	15
China	20	19	Algeria	3	10
Italy	20	19	Iran	2	8
Japan	12	11	Ukrain	2	6
Austria	10	9	Serbia	2	5
Taiwan	5	5	Qatar	2	5
India	2	2	Uzbekhistan	1	4
Israel	2	1	Netherlands	1	3
Tayland	1	1	Germany	1	3
Spain	1	1	Romain	1	3
Total 10 Countries	100	96	Total 10 Countries	20	62
Others	4	4	Others	12	38
Total	104	100	Total	32	100

Table 17: Plastics Extrusion Machines Imports & Exports by Countries – 2016/11

Source: TurkStat

3.4. SUPPLY & DEMAND BALANCE IN BLOW MOLDING MACHINES

In the January - November period of 2016, production of plastic blowing machines amounted to around 1 million dollars and imports amounted to 20 million dollars. Since negligible exports have been realised, domestic sales and foreign trade deficit amounted to USD 21 million. 97 % of domestic sales were covered by imports and the import coverage ratio of exports realised as 2 %.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	1	1	1	-33
Imports	17	20	22	26
Exports	1	-	-	-33
Domestic Sales	18	21	23	23
Foreign Trade Deficit	-17	-20	-22	28
Importst / Domestic Sales (%)	95	97	97	
Exports /Imports (%)	3	2	2	

Table 18: Supply & Demand Balance in Blow Molding Machines (USD Million)

Source: TurkStat

At the end of 2016, in plastics blowing machines industry; production is expected to be 1 million dollars, imports 22 million dollars, domestic sales (blow molding machines investment of the plastic industry) 23 million dollars and foreign trade deficit 22 million dollars.

In January - November period of 2016, plastic blowing machines were imported only from 10 countries. Italy, France and India received 65 % of total imports.

	USD Million	\$- %
Italy	7.0	35
France	3.4	17
India	2.6	13
Germany	2.2	11
China	1.9	9
Japan	1.3	6
Taiwan	1.1	5
Austria	0.4	2
USA	0.2	1
Kazakhstan	0.1	0

Table 19: Plastics Blow Molding Machines Imports by Countries – 2016/11

Source: TurkStat

In this period, Turkey exported blow molding machines only to 8 countries and 26 % of total exports realized to Azerbaijan.

	USD Million	\$- %
Azerbaijan	90	26
Egypt	54	15
Turkmenistan	48	14
Morocco	36	10
Uzbekhistan	36	10
Algeria	34	10
Lebanon	32	9
Syria	20	6
Total	350	100

Table 20: Plastics Blow Molding Machines Exports by Countries – 2016/11
Source: TurkStat

3.5. SUPPLY & DEMAND BALANCE IN THERMOFORM MACHINES

USD 43 million of production, USD 14 million of imports, USD 17 million of exports and USD 40 million of domestic market sales (thermoform machines investment of plastics industry) were realized in the January - November period of 2016. Foreign trade deficit of thermoform machines realized around USD 3 million in this period.

It can be observed that the 36 % of the domestic sales (thermoform machines investment of the industry) was provided by imports and import coverage ratio of exports 121 % in the same period.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	30	43	46	53
Imports	9	14	15	63
Exports	12	17	19	53
Domestic Sales	28	40	43	56
Foreign Trade Deficit	3	3	3	17
Importst / Domestic Sales (%)	34	36	36	
Exports /Imports (%)	129	121	121	

Table 21: Demand Balance in Thermoform Machines (USD Million)

Source: TurkStat

At the end of 2016, in the plastics thermoforming machines industry; production is expected to be 46 million dollars, imports 15 million dollars, exports 19 million dollars, domestic sales (thermoform machinery investment of plastics industry) 43 million dollars and 3 million dollars of foreign trade deficit.

In the January - November period of 2016, thermoforming machines were imported only from 10 countries. China, Germany and Taiwan as the main import partners received 69 % share in total imports on value basis.

In the same period, 63 of total exports of thermoforming machines were realised to 10 countries while Republic of South Africa, UAE received 23 % of total exports.

Imports			Exports		
Countries	USD Million	% - Share	Countries	USD Million	% - Share
China	3.5	25	Rep. of S. Africa	2.1	12
Germany	3.4	24	UAE	1.9	11
Taiwan	2.8	20	S. Arabia	1.4	8
Italy	1.5	10	Indonesia	1.2	7
USA	1.3	9	Lebanon	1.1	7
Hungary	0.7	5	Egypt	0.8	5
Sweetzerland	0.5	4	Ukrain	0.7	4
U.K.	0.2	1	El Salvador	0.5	3
S. Korea	0.1	1	Tayland	0.5	3
Spain	0	0	Bulgaria	0.5	3
10 Countries Total	14.1	100	10 Countries Total	10.7	63
Others	0	0	Others	6.3	37
Total	14.1	100	Total	17	100

Table 22: Exports and Imports of Thermoform Machines by Countries 2016/11

Source: TurkStat

3.6. SUPPLY & DEMAND BALANCE IN PRESSES AND OTHER MACHINES

In the January - November period of 2016, 138 million dollars of production, 190 million dollars of imports, 55 million dollars of exports and 272 million dollars of domestic sales were realized in presses and other machines industry. The foreign trade deficit in the presses and other machines realised as 135 million dollars.

In the January - November period of 2016, 70 % of the domestic sales of presses and other machines (pressed and other machines investments of plastics industry) were met by imports and the import coverage ratio of exports was 29 %.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	162	138	150	-7
Imports	204	190	207	1
Exports	65	55	60	-7
Domestic Sales	302	272	297	-2
Foreign Trade Deficit	-140	-135	-147	5
Importst / Domestic Sales (%)	68	70	70	
Exports /Imports (%)	32	29	29	

Table 23: Supply & Demand Balance in Presses and Other Machines (USD Million)

Source: TurkStat

At the end of 2016, in presses and other machines industry; Production is expected to reach 150 million dollars, imports 207 million dollars, exports 60 million dollars and domestic sales

(presses and other machinery investment of plastics industry) 297 million dollars and foreign trade deficit to 147 million dollars.

Imports from 10 countries in the January - November period of 2016 accounted for 90 % of the total on value basis and Italy, Germany and China received 64 % of total imports.

In the same period, 40 % of the total press exports were realised to 10 countries. Iran, USA and Netherlands, as the main export markets, shared 21 % of total exports.

Imports			Exports		
Countries	USD Million	% - Share	Countries	USD Million	% - Share
Italy	55	30	Iran	4	8
Germany	33	18	USA	3	6
China	30	16	Netherlands	3	5
Japan	12	7	Algeria	2	3
Taiwan	9	5	Bulgaria	2	3
U.K.	9	5	India	2	3
Sweetzerland	6	3	Israel	2	3
Austria	5	3	Russian Fed.	1	3
USA	4	2	Azerbaijan	1	3
S.Korea	4	2	S. Arabia	1	3
10 Countries Total	167	90	10 Countries Total	21	40
Others	18	10	Others	31	60
Total	184	100	Total	51	100

Table 24: Presses and Other Machines Imports & Exports by Countries – 2016/11

Source: TurkStat

3.7. SUPPLY & DEMAND BALANCE IN PARTS & COMPONENTS

In the January - November period of 2016, 137 million dollars production, 36 million dollars imports, 17 million dollars exports and 156 million dollar domestic market sales were realized in plastics processing machines parts and components industry. In this period, foreign trade deficit realised as 19 million dollars.

In this period, 23 % of domestic sales (parts and componets investments of plastics industry) were covered by imports and the import coverage ratio of exports realised as 47 %.

	2015	2016/11	2016/E	% Increase (E) (2016/2015)
Production	123	137	150	22
Imports	42	36	40	-7
Exports	15	17	19	22
Domestic Sales	150	156	170	14
Foreign Trade Deficit	-27	-19	-21	-23
Importst / Domestic Sales (%)	28	23	23	
Exports /Imports (%)	36	47	47	

Table 25: Supply & Demand Balance in Parts and Components (USD Million)

Source: TurkStat

At the end of 2016, in parts and components industry; production is expected to reach to 150 million dollars, imports to 40 million dollars, exports to 19 million dollars, domestic sales (parts and accessories investment of plastics industry) to 170 million dollars and foreign trade deficit to 21 million dollars.

In the January - November period of 2016, 10 countries constituted 94 % of the total imports on amount and 91 % on value basis. Germany, China and Italy received 59 % of total imports.

In the same period, 61 % of total exports of parts and components realised to 10 export markets on value basis. Germany, Iran, and Bulgaria as main export markets received 41 % of total exports.

Imports					Exports				
Countries	1000 Tons	USD Million	Ton - %	\$ - %	Countries	1000 Tons	USD Million	Ton - %	\$ - %
Germany	222	11	19	26	Germany	405	3.8	21.6	18
China	594	7	50	17	Iran	62	3.5	3.3	16.5
Italy	107	7	9	16	Bulgaria	193	1.3	10.3	6.1
Japan	37	3	3	7	Macedonia	12	1	0.6	4.7
USA	17	2	1	6	Romain	43	0.8	2,3	3.6
France	15	2	1	5	Russian Fed.	26	0.7	1.4	3.5
Sweetzerland	11	2	1	4	USA	54	0.5	2.9	2.2
Taiwan	75	1	6	3	Kazakhstan	21	0.4	1.1	2.1
Austria	23	1	2	3	Sweetzerland	15	0.4	0.8	2
Netherlands	13	1	1	3	S. Arabia	62	0.4	3.3	1.9
Total 10 Countries	1.114	38	94	91	Total 10 Countries	894	12.7	47.6	60.5
Others	73	4	6	9	Others	985	8.3	52.4	39.5
Total	1.186	42	100	100	Total	1.879	21	100	100

Table 26: Parts and Components Imports & Exports by Countries – 2016/11

Source: TurkStat

4. CONCLUSION

4.1. MAIN PROBLEMS OF PLASTICS PROCESSING MACHINERY INDUSTRY

General problems in the machinery manufacturing industry can also be applied to the plastics processing machines industry. In addition to these general problems, the absence of any national strategy and enough protection for domestic manufacturers of machine industry are the major problems faced in the plastics processing machines.

Turkey, as for plastic processing machinery has a very serious investing plastics industry. Thus, Turkey is one of the world's most important market in this area. But 80 % of the market is dominated by imported machines.

Turkey is a net importer in the plastics processing machines trade and machines exported are far from providing high added value when compared their unit prices.

The developments in the plastics processing machines and their accessories and parts industry, despite significantly developing the plastics industry and the propensity to invest following the similar pattern, is under constant pressure of the cheap imports conducted in China. Imports receives a higher margin in sharing the increasing demand.

The lack of a state strategy for the plastics processing machinery sector, adequate protection of domestic producers and provide competitive advantages of plastics products manufacturer, they choose the second-hand imports of machinery.

The most important problems encountered in Turkey include plastics processing machinery sector;

- ✓ There is not a certain vision of the sector.
- ✓ Horizontal and vertical cooperation before competition between firms is not available.
- ✓ R&D, P&D, industrial design and product development efforts are insufficient in the industry.
- ✓ Patents and trademark investments are not enough in the industry.
- ✓ Industry's international technical compliance is insufficient.
- ✓ Equity capital and working capital of the companies are inadequate.
- ✓ Energy costs are high.
- ✓ The industry needs for the marketing customer relationship management.
- ✓ Despite the developments in the plastics processing machinery and their accessories and parts sector, the growth of the plastics industry to a large extent and the trend towards investment trends, the sector is especially under the cheap import pressure made by China, Far East countries. Imports share more than domestic production in demand increases.
- ✓ Turkey is a net importer of plastics processing machinery and their parts and components and imports expensive machines while exporting with relatively lower added value machines.

4.2. PROPOSED STRATEGIES

Machinery including plastics processing machinery is the basic sector that produces investment goods and has a special and important place in the manufacturing industry. It covers the entire sub-sectors called "engineering industries" where machine and spare parts are manufactured. It is an industry that is given priority in all developed countries and is defined as the priority sector. The locomotive role of machinery industry in which engineering and research are intensive and indispensable can be summarised as:

- ✓ The manufacturing industry has entered into and supplying inputs for almost all sectors,
- ✓ Driving force of the industry,
- ✓ Mobilization of the engineering discipline and
- ✓ Determination of development speed and production compositions according to new needs and demands.

Vision of Machine Manufacturing Industry in Strategy Document prepared for Machine Manufacturing Industry; it is described as "Turkey's being the technology production base in the machinery sector". The main objective in achieving this vision is to develop the machinery industry and to ensure that high-tech products are manufactured.

The principle strategies for Turkish plastics processing machines industry to produce and export machines with higher added value could be as listed below:

It is seen that the export markets of the top ten plastics processing machinery exports of Turkey are countries with a share of 15 % in total imports of plastic processing machines in the world. In order for Turkey to increase exports of plastic processing machinery, it is necessary to increase its promotional activities to other countries that have an 85 % share of the world plastics processing machinery imports.

Turkey can establish the necessary incentive infrastructure to invest in global machinery producers in Turkey by using the experience of machinery production with cheap and grown manpower. In addition to that incentives can be provided for the investment of plastic processing machines in Turkey by global players.

Despite the fact that the number of plastic processing machines operating in all European countries is around 3000-3500, the presence of 600 machine manufacturers in Turkey causes the turnover and profitability per company to be at a low level. Today 's production of value - added machines requires very large R&D spending. A large number of domestic machinery producers, all at the SME level, have difficulties in accessing technological level at the level of the machinery of the western companies by making R&D expenditures on these scales individually as the reason for the inadequacy of existing financial power.

For this reason, instead of production machines in Turkey, parts and components of these machines should be produced at the desired quality level so that the global players of the sector enter the parts procurement system of Turkey. Turkey should be regarded as one of the important production and export center for the parts and accessories of plastic processing machines.

In order for the Turkish plastic processing machinery sector to produce and export more value-added machines, the main strategies are as described in the Machinery Sector Export Strategy Document. General Purpose; "Improvement of Machinery Industry and Ensure the Manufacture of High-Tech Products". The main objectives that should be adopted in the industry are:

- ✓ To increase competitive production opportunities in the global markets by enhancing the technological level of the industry.
- ✓ To turn the traditional machine product structure of the industry into a structure in which machines with higher added value are manufactured and to increase the manufacture and added value of the industry by pulling away the foreign capital investments.
- ✓ To establish large scaled injection and extrusion machines producers in the industry which will create a brand in the global markets and to organize the other companies as subsidiary industry companies which manufacture accessories and parts for the said companies and global machine manufacturers,
- ✓ To increase the productivity of the industry and to develop and to spread the aggregation activities in order to establish synergy.
- ✓ To establish the training infrastructure of the industry in order to meet the need for trained intermediate staff.
- ✓ To increase the support provided for industry oriented R&D, Product Development and innovation,
- ✓ Informal production and unfair competition must be prevented.
- ✓ Apart from the growth rate of the plastics industry, the positive / negative developments in the foreign markets will also have a direct effect on the plastics processing machines industry.
- ✓ On the aforementioned matter, it should assign tasks to industrial unions outside of government agencies on matters such as searching for potential foreign markets and expansion of companies to such markets. Branches should be established and road show and bilateral meetings should be organized in potential foreign markets by industrial unions with the intention of advertisement and marketing.
- ✓ While companies which make sizable factory investments can purchase machines of 5 year term with various and advantageous credits, our country is left with single machine orders with low prices. As there are no discounts made due to the size of the order, these orders are lost to countries such as China – Taiwan. A credit system similar to Hermes in Germany must be established in Turkey and Exim Bank credits must be turned into resources to which machine manufacturing SMEs can easily access in order to develop the exports of machines. Credit must be provided to small and medium sized enterprises abroad by Exim bank and these enterprises should be encouraged to import from Turkey.
- ✓ Rate and term guarantees should be provided to exporters in long term export sales.

- ✓ The plastics processing machines industry must produce machines with higher added value and competition level in global markets. However, there are a great number of plastics processing machine and accessories and parts manufacturers in Turkey and the production capacity and capacity output per company are very low, below the economic scales. For that reason, inter-enterprise mergers or strategical cooperation concerning R&D (common R&D centers) must be established in order for the small companies to achieve the power to conduct R&D.
- ✓ Turkey can set up the necessary incentive substructure for global machine manufacturers to invest in Turkey by using its cheap and qualified manpower and experience in machine manufacturing and special incentives can be provided to the global players for their investments on plastics processing machines in Turkey. Turkey could be turned into a production and exports base for at least some of the plastics processing machines with the incentive substructure which is to be applied in the said manner.
- ✓ In this day and age the manufacturing of machines which provide added value requires great R&D expenditures. It is difficult for the domestic machine manufacturers, all of which are at SME level, to make such R&D expenditures and reach the technological level used by the Western countries in manufacturing due to their financial in capabilities. For that reason, rather than main machine production in Turkey, the manufacture of accessory and parts of these machines at the required quality level and entering into supply system of the global players of our industry and Turkey becoming the manufacture and exports base for plastics processing machine accessories and parts could be the second strategy to pursue.
- ✓ Passing on the legal regulations and structural measures to provide a transformation to high "Added Value" and "Trademark Value machine industry.
- ✓ To provide sustainable financial solutions for the sector in order to achieve sustainable growth at home and abroad and to take advantage of economies of scale.
- ✓ Provide sustainable, competent, high-performance, technology-focused, human resources at all levels of learning and change.
- ✓ To make an effective promotion both in Turkey and abroad and in order to increase exports, giving priority to the quality, trust and technology elements of the Turkish Machine Industry.
- ✓ To give emphises on R&D and innovation in order to be able to produce high value-added products that can compete globally.
- ✓ Prevention of unregistered production and unfair competition,
- ✓ Opening offices in potential foreign markets for promotion and marketing, organizing road shows and bilateral meetings.
- ✓ The introduction of exporter and maturity guarantee in long term export sales, Preventing the penetration of the machinery which does not meet the EU standards in Turkey,



- Adequate level of market surveillance and supervision activities, ensuring uncompromising standardization controls.