PAGEV

TURKISH PLASTICS PROCESSING MACHINERY INDUSTRY FOLLOW-UP REPORT

2020

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PREFACE

The plastic industry is one of the most important actors of the Turkish economy. Today, the contribution of the plastics industry to the country's economy is gradually increasing with the total production exceeding 9 million tons, and 35 billion dollars' worth of turnover, the approaching direct exports of 5 billion dollars.

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

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

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

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

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

Best regards,
Yavuz EROĞLU
PAGEV President

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EXECUTIVE SUMMARY

In the period covering the years 2015-2020, the plastics industry has invested an average of $ 840 million in machinery and equipment per year, 40% of the total investment is in presses and other machines, 22% injection, 17% extrusion, 5% thermoforming, 3% '' was blow molding and 13% was parts and components.

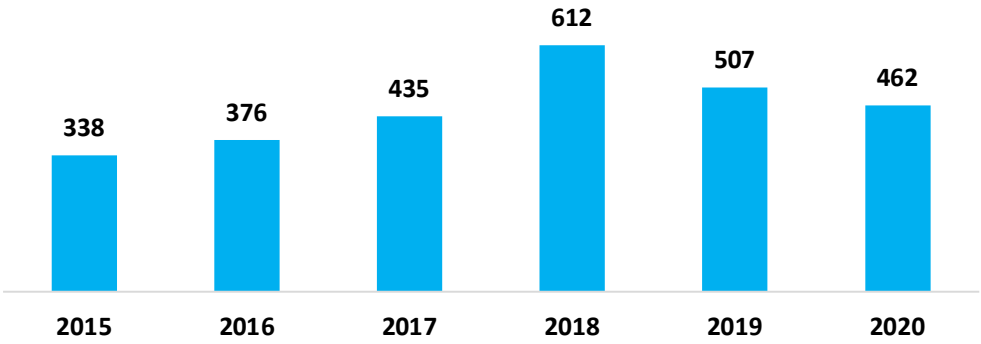
In 2020, among the total machinery investments of the plastic industry, injection machines have a share of 24%, extrusion machines 19%, blow molding machines 4%, thermoforming machines 4%, presses and other machines 36% and parts and components 13%.

In 2020, 462 million dollars of production, 603 million dollars of imports, 195 million dollars of exports and 870 million dollars of domestic market sales (machinery and equipment investment of the plastics industry) were realized in the plastic processing machinery and parts sector.

During this period, the sector had a foreign trade deficit of 407 million dollars, 69% of domestic sales (machinery and equipment investment of the sector) were met by imports and the ratio of exports to imports was 32%.

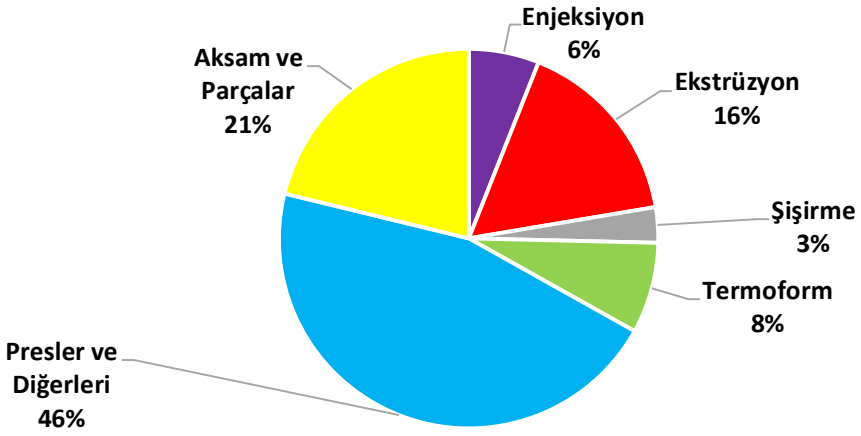
1. PRODUCTION

The production of plastic processing machines, which increased by an average of 5.3% per year between 2015 and 2020, decreased by 9% in 2020 compared to 2019 and decreased to 462 million dollars.



Graphic 1: Plastics Processing Machines Production (Million $)
Source: Turk Stat and ITC Trade Statistics

In 2020, among the total production of plastic processing machines, injection machines shared 6%, extrusion machines 16% blow molding machines 3% thermoforming machines 8% presses and other machines 46% and parts and parts 21%.

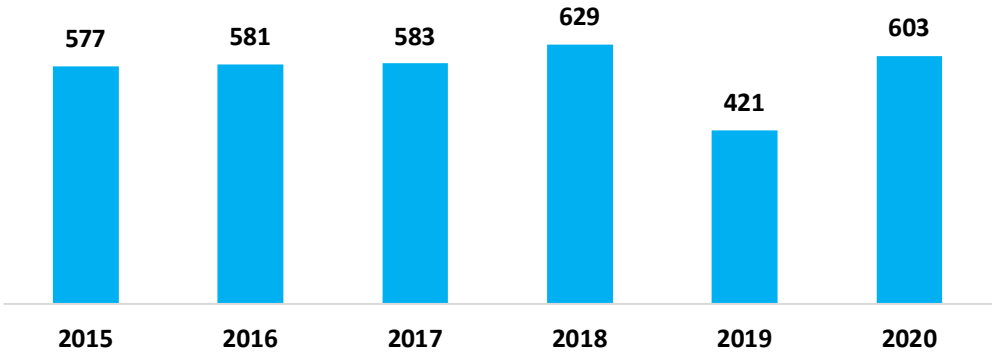


Graphic 2: Breakdown of Plastics Processing Machines Production (2020)
Source: Turk Stat and ITC Trade Statistics

2. FOREIGN TRADE

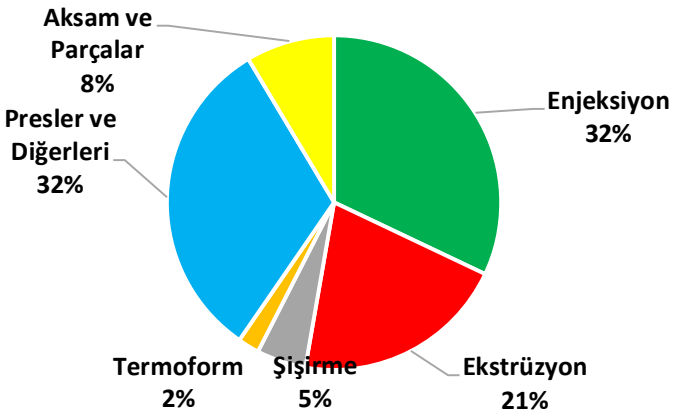
2.1. IMPORTS

Imports of plastic processing machinery, which increased by an average of 0.7% annually between 2015 and 2020, increased by 43% compared to 2019 and reached 603 million dollars in 2020.



Graphic 3: Plastics Processing Machines Imports (Million $)
Source: Turk Stat and ITC Trade Statistics

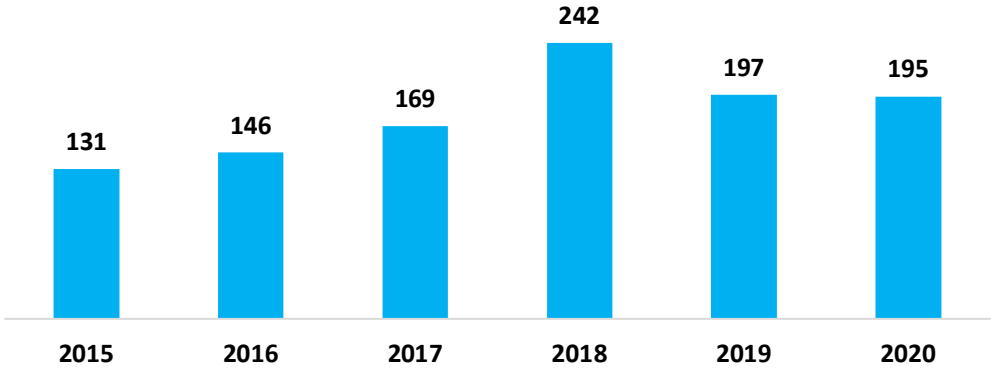
In 2020, among the total imports of plastic processing machines, injection machines shard 32%, extrusion machines 21% blow molding machines 5%, thermoforming machines 2%, presses and other machines 32% and parts and components 8%.



Graphic 4: Breakdown of Plastics Processing Machines Imports (2020)
Source: Turk Stat and ITC Trade Statistics

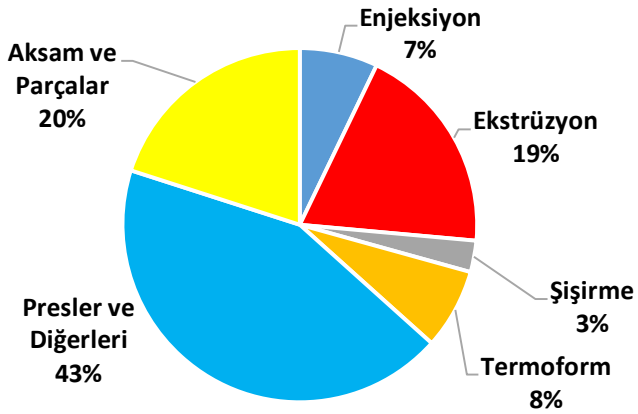
2.2. EXPORTS

Exports of plastic processing machinery, which increased by an average of 6.8% annually between 2015 and 2020, decreased by 1% in 2020 compared to 2019, and decreased to 195 million dollars.



Graphic 5: Plastics Processing Machines Exports (Million $)
Source: Turk Stat and ITC Trade Statistics

In 2020, among the total plastic processing machines export, injection machines shared 7%, extrusion machines 19% blow molding machines 3% thermoforming machines 8% presses and other machines 43% and parts and components 20%.



Graphic 6: Breakdown of Plastics Processing Machines Exports (2020)
Source: Turk Stat and ITC Trade Statistics

2.3. FOREIGN TRADE BY COUNTRIES

In 2020, imports of plastic processing machines and components and parts realized from 10 countries constituted 93% of total imports. In this period, China, Germany, and Italy took the first 3 countries in plastic processing machinery imports. The share of these 3 countries in total imports is around 71%.

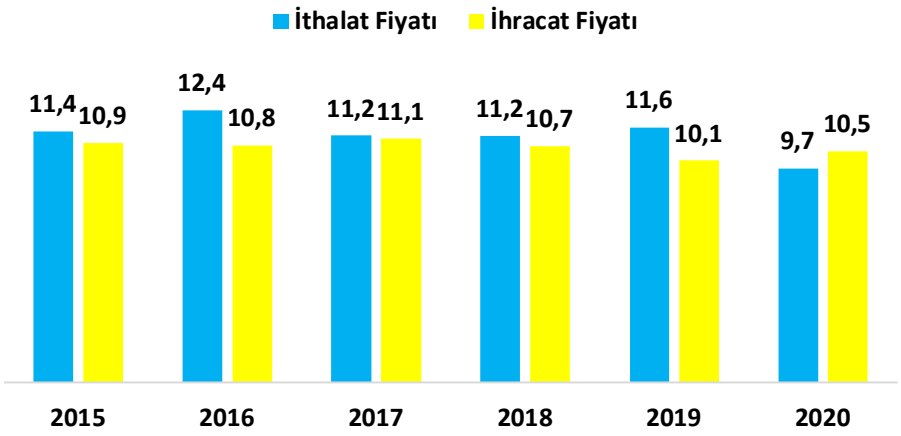
On the other hand, exports of plastic processing machines and parts and components destined to 10 countries in this period constituted 49% of total exports. In 2020, Germany, Russian Federation and Iran ranked first 3 in plastic processing machinery export market. The share of these 3 countries in total exports is 26%.

	Imports			Exports	
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
China	220,4	36,6	Germany	24,1	12,3
Germany	156,6	26,0	Russian Fed.	20,0	10,3
Italy	51,7	8,6	Iran	7,8	4,0
Austria	45,9	7,6	USA	7,7	3,9
Taiwan	24,4	4,0	Romania	7,0	3,6
Japan	15,4	2,6	India	6,9	3,6
S.Korea	13,6	2,3	Algeria	6,9	3,5
Switzerland	12,7	2,1	Poland	5,7	2,9
India	10,8	1,8	Uzbekistan	5,3	2,7
France	9,5	1,6	S.Arabia	4,2	2,2
10 Total	**560,9**	**93,1**	**10 Total**	**95,8**	**49,1**
Others	**41,8**	**6,9**	**Others**	**99,5**	**50,9**
Total	**602,7**	**100,0**	**Total**	**195,3**	**100,0**

Table 1: Plastics Processing Machines Foreign Trade by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

2.4. IMPORT AND EXPORT PRICES

The average unit import price of plastic processing machines and their parts components was 9.7 $ / Kg in 2020 and decreased by 16% compared to 2019.



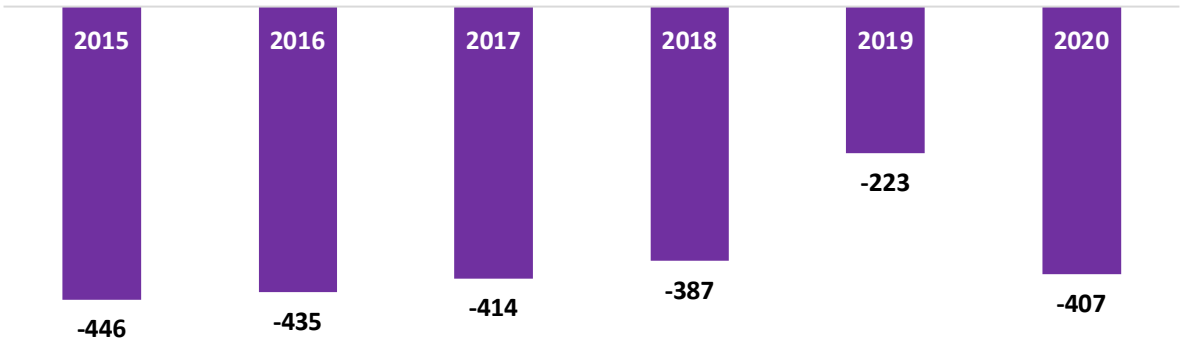
Graphic 7: Plastics Processing Machines Foreign Trade Unit Prices ($/Kg)
Source: Turk Stat and ITC Trade Statistics

The average unit export price of plastic processing machines and their parts and components was 10.5 $ / Kg in 2020, increasing by 4.3% compared to 2019.

During this period, average export unit prices were 8% below average import prices.

2.5. FOREIGN TRADE DEFICIT

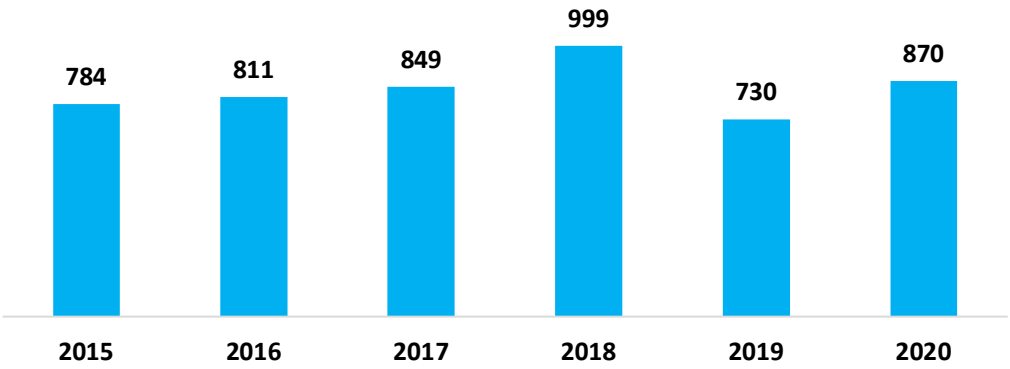
The foreign trade deficit of plastic processing machinery, which declined by an average of 1.5% per year between 2015 and 2020, increased by 82% in 2020 compared to 2019 and reached to 407 million dollars.



Graphic 8: Plastics Processing Machines Foreign Trade Deficit (Million $)
Source: Turk Stat and ITC Trade Statistics

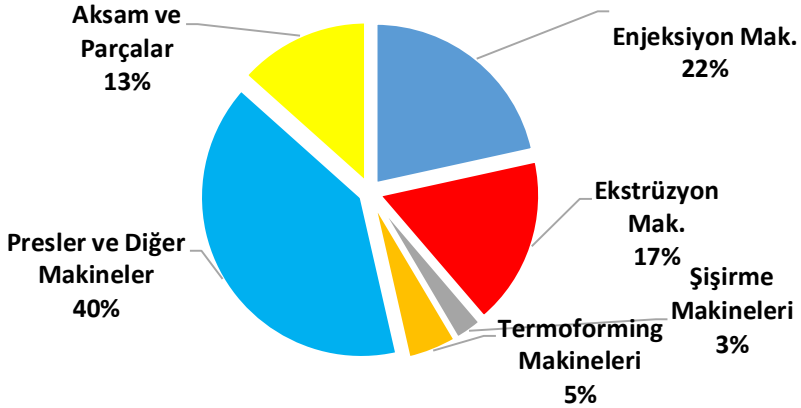
3. DOMESTIC SALES (MACHINERY INVESTMENTS OF PLASTICS INDUSTRY)

The machinery investments of the plastics industry, which increased by an average of 2.1% per year between 2015 and 2020, increased by 19% in 2020 compared to 2019 and decreased to 870 million dollars.



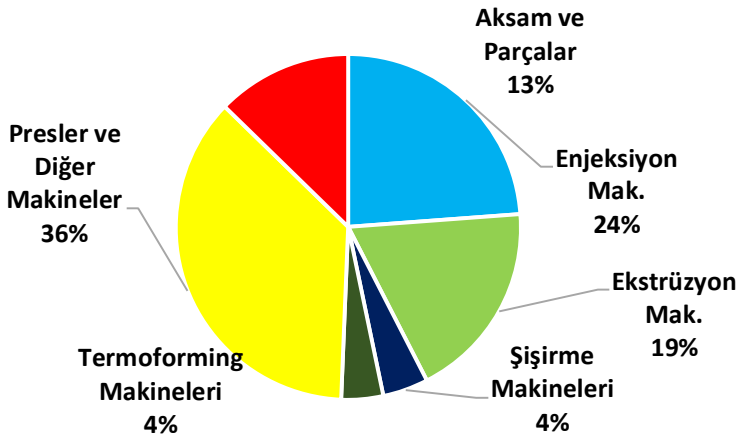
Graphic 9: Plastics Processing Machines Domestic Sales(Million $)
Source: Turk Stat and ITC Trade Statistics

In the period covering the years 2015-2020, the plastics industry has invested an average of $ 840 million in machinery and equipment per year, 40% of the total investment is in presses and other machines, 22% injection, 17% extrusion, 5% thermoforming, 3% blow molding and 13% was parts and components.



Graphic 10: Machinery Investment Breakdown of The Plastics Industry in The Last Five Years
Source: Turk Stat and ITC Trade Statistics

In 2020, among the total machinery investments of the plastic industry, injection machines have a share of 24%, extrusion machines 19%, blow molding machines 4%, thermoforming machines 4%, presses and other machines 36% and parts and components 13%.

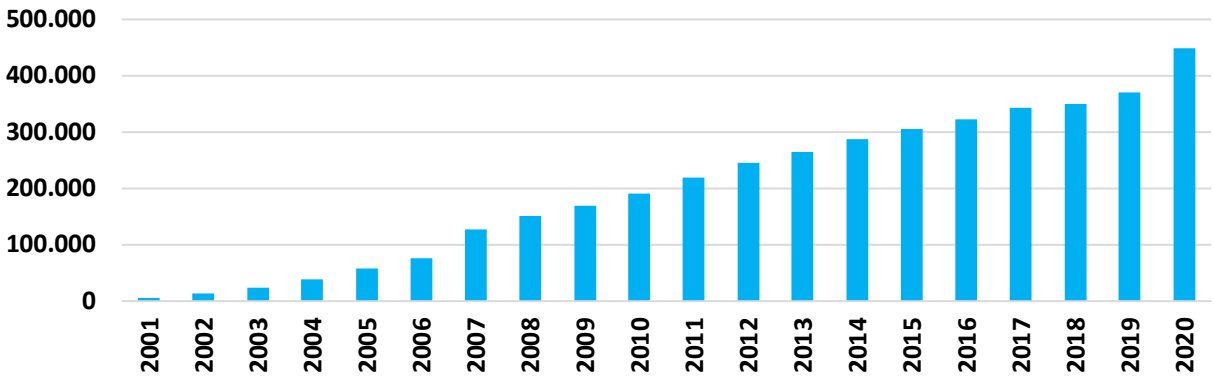


Graphic 11: Machinery Investment Breakdown of The Plastics Industry (2020)
Source: Turk Stat and ITC Trade Statistics

4. MACHINERY PARK OF PLASTICS INDUSTRY

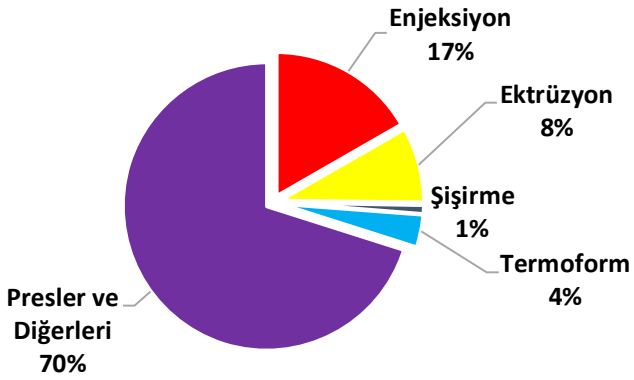
4.1. BREAKDOWN BY UNITS

While having the process capacity of 2.5 million tons and machine park of 5,688 units in 2001, Turkey's plastics industry processing capacity reached to 9 million tons in 2020, and industry's machine park to 448 thousand units in 2020.



Graphic 12: Plastics Industry Machinery Park
Source: Turk Stat and ITC Trade Statistics

In 2020, shares od-f total processing machines park realized as: 17% injection, extrusion, 10%, 1% blow molding, 4% thermoforming and %70 presses and other machines.



Graphic 13: Breakdown of Plastics Industry Machinery Park (Units)
Source: Turk Stat and ITC Trade Statistics

By the end of 2020, % 57 of total machine park constitutes by imported machines and 43% by domestically produced machines .

	Units			% Share	
	Domestically Produced	Imported	Total	Domestically Produced	Imported
Injection	7.615	67.349	74.964	10	90
Extrusion	6.227	32.002	38.229	16	84
Blow Molding	768	3.691	4.459	17	83
Thermoform	6.047	10.230	16.277	37	63
Presses and Others	170.717	143.699	314.416	54	46
Total	191.374	256.971	448.345	43	57

Table 2: Plastics Industry Machinery Park (Units)

The share of imported machines in the total machine park by piece; 90% in injection machines, 84% in extrusion machines, 83% in blow molding machines, 63% in thermoform machines and 46% in presses and others.

In other words, the share of domestically produced machines in the total park on unit basis; 10% in injection machines, 16% in extrusion machines, 17% in blow molding machines, 37% in thermoforming machines, and 54% in presses and other machines.

96.5% of the imported injection machine park is composed of machines imported from 10 countries on unit basis. 43.7% of the park consists of China, 18.1% Germany, 9.6% Italy, 8.9% Taiwan and 6.2% Austria origin machines.

Injection		Extrusion		Blow Molding		Thermoform	
Countries	**% Share**	**Countries**	**% Share**	**Countries**	**% Share**	**Countries**	**% Share**
China	43,7	China	63,3	Italy	30,5	Germany	21,0
Germany	18,1	Germany	13,8	Germany	21,5	China	18,8
Italy	9,6	Italy	7,3	China	9,4	Italy	14,9
Taiwan	8,9	Taiwan	4,3	France	8,4	Taiwan	10,0
Austria	6,2	Austria	3,9	Japan	7,2	France	5,7
Switzerland	2,8	S.Korea	1,6	Taiwan	4,5	Israel	5,1
France	2,7	India	1,1	UK	4,0	Switzerland	4,5
Japan	2,4	Japan	0,8	Switzerland	3,5	USA	4,2
S.Korea	1,2	USA	0,8	Austria	3,0	S.Korea	3,4
India	0,9	UK	0,7	Belgium	2,8	Austria	2,8
10 Total	**96,5**	**10 Total**	**97,5**	**10 Total**	**94,9**	**10 Total**	**90,4**
Others	**3,5**	**Others**	**2,5**	**Others**	**5,1**	**Others**	**9,6**

Table 3: Plastics Industry Imported Machinery Park by Countries (Units)

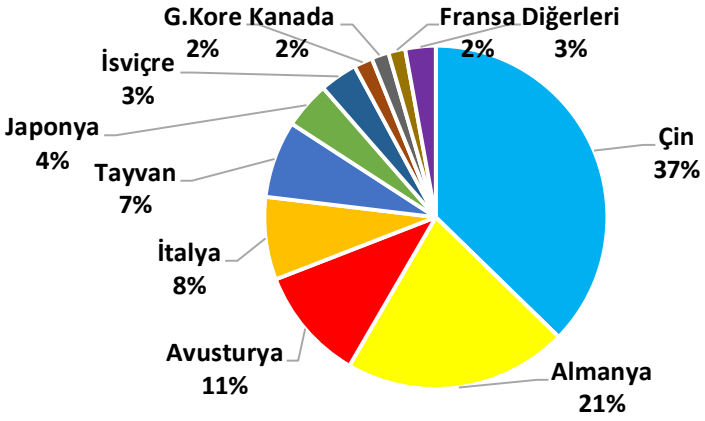
97.5% of the imported extrusion machine park is composed of machines imported from 10 countries. The park consists of 63.3% China, 13.8% Germany, 7.3% Italy, 4.3% Taiwan and 3.9% Austrian origin machines.

94.9% of the imported blow molding machine park is composed of machines imported from 10 countries. 30.5% of the park is composed of machines originating from Italy, 21.5% from Germany, 9.4% from China, 8.4% from France and 7.2% from Japan.

90.4% of the imported thermoforming machines park is composed of machines imported from 10 countries. 21% of the park consists of Germany, 18.8% China, 14.9% Italy, 10% Taiwan and 5.7% France origin machines.

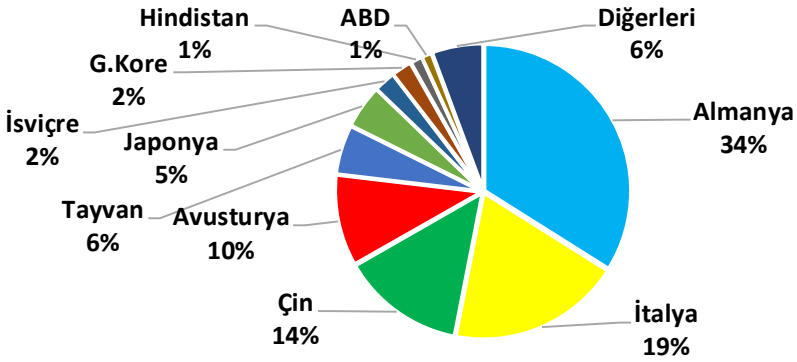
4.2. BREAKDOWN BY VALUE

In the last 20 years covering the years 2001 - 2020, 97.1% of the total imports of injection machines on value basis were made from 10 countries. Based on value, 37.3% of imported injection machines were from China, 22.1% from Germany, 10.7% from Austria, 7.8% from Italy, 7% 2 were carried out from Taiwan.



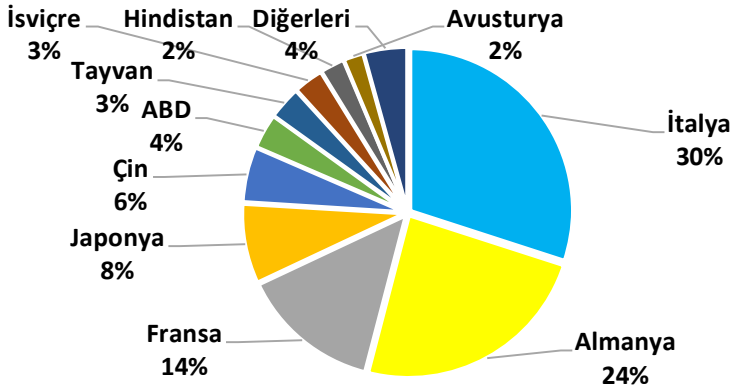
Graphic 14: Plastics Industry Injection Machines Park by Countries ($)
Source: Turk Stat and ITC Trade Statistics

In the last 20 years covering the years 2001 - 2020, 94.3% of the total imports of extrusion machines on value basis were made from 10 countries. Based on value, 33.9% of the extrusion machines imported during this period were from Germany, 19.1% from Italy, 13.7% from China, 10.1% from Austria, 5%, 5 of them were carried out from Taiwan.



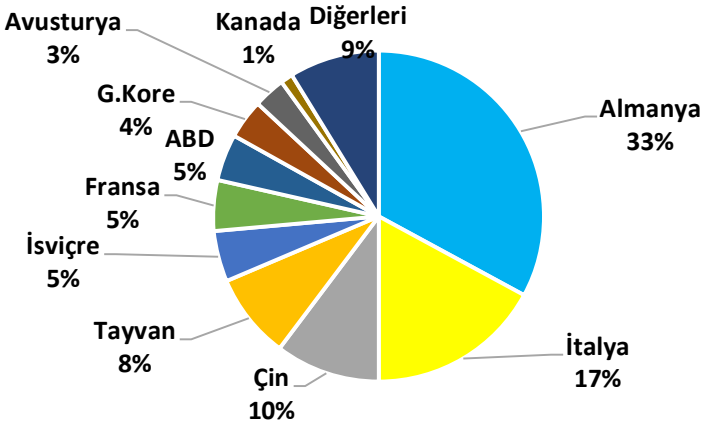
Graphic 15: Plastics Industry Extrusion Machines Park by Countries ($)
Source: Turk Stat and ITC Trade Statistics

In the last 20 years covering the years 2001 - 2020, 95.7% of the total imports of blow molding machines on value basis were made from 10 countries. In terms of value, 30% of imported blow molding machines were from Italy, 24.1% from Germany, 13.9% from France, 8% from Japan, 5.5% from China.



Graphic 16: Plastics Industry Blow Molding Machines Park by Countries ($)
Source: Turk Stat and ITC Trade Statistics

In the last 20 years covering the years 2001 - 2020, 91.2% of the total imports of thermoforming machines on value basis were made from 10 countries. In terms of value, 32.9% of the thermoforming machines imported during this period from Germany, 17.1% from Italy, 10.2% from China, 8.3% from Taiwan, 5% also carried out from Switzerland.



Graphic 17: Plastics Industry Thermoform Machines Park by Countries ($)
Source: Turk Stat and ITC Trade Statistics

Injection		Extrusion		Blow Molding		Thermoform	
Countries	**% Share**	**Countries**	**% Share**	**Countries**	**% Share**	**Countries**	**% Share**
China	37,3	Germany	33,9	Italy	30,0	Germany	32,9
Germany	21,1	Italy	19,1	Germany	24,1	Italy	17,1
Austria	10,7	China	13,7	France	13,9	China	10,2
Italy	7,8	Austria	10,1	Japan	8,0	Taiwan	8,3
Taiwan	7,2	Taiwan	5,5	China	5,5	Switzerland	5,0
Japan	4,4	Japan	4,9	USA	3,4	France	4,9
Switzerland	3,6	Switzerland	2,4	Taiwan	3,3	USA	4,6
S.Korea	1,7	S.Korea	2,3	Switzerland	3,0	S.Korea	3,8
Canada	1,6	India	1,3	India	2,4	Austria	3,1
France	1,6	USA	1,2	Austria	2,0	Canada	1,2
10 Total	**97,1**	**10 Total**	**94,3**	**10 Total**	**95,7**	**10 Total**	**91,2**
Others	**2,9**	**Others**	**5,7**	**Others**	**4,3**	**Others**	**8,8**
Total	**37,3**	**Total**	**100,0**	**Total**	**100,0**	**Total**	**100,0**

Table 4: Imported Plastics Processing Machined by Countries ($ - %)

5. SUPPLY AND DEMAND

5.1. TOTAL INDUSTRY

In 2020, 462 million dollars of production, 603 million dollars of imports, 195 million dollars of exports and 870 million dollars of domestic market sales (machinery and equipment investment of the plastics industry) were realized in the plastic processing machinery and parts and components industry.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	338	507	462	-9	5,3
Imports	577	421	603	43	0,7
Exports	131	197	195	-1	6,8
Domestic Sales	784	730	870	19	1,7
Foreign Trade Deficit	-446	-223	-407	82	-1,5
Imports/Domestic Sales (%)	74	58	69		
Exports /Imports (%)	23	47	32		

Table 5: Total Plastic Processing Machines Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

During this period, the sector had a foreign trade deficit of 407 million dollars, 69% of domestic sales (machinery and equipment investment of the sector) were met by imports and the ratio of exports to imports was 32%.

5.2. PLASTICS INJECTION MACHINES

In 2020, 28 million dollars of production, 193 million dollars of imports, 14 million dollars of exports and 207 million dollars of domestic market sales were realized in plastic injection machines. In this period, foreign trade deficit in plastic injection machines was 179 million dollars.

In this period, it is seen that 93% of the domestic sales (investment in injection machines of the sector) in plastic injection machines were met by imports and the ratio of exports to imports was 7%.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	16	34	28	-17	9,8
Imports	192	101	193	91	0,1
Exports	8	17	14	-17	9,8
Domestic Sales	200	118	207	76	0,6
Foreign Trade Deficit	-184	-84	-179	112	-0,4
Imports/Domestic Sales (%)	96	86	93		
Exports /Imports (%)	4	17	7		

Table 6: Injection Machines Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

In 2020, 99% of the total imports of plastic injection machines were made from 10 countries. China has a share of 63%, Germany 14% and Austria 7% of total imports.

In the same period, 69% of the plastic injection machines export was made to 10 countries, while Algeria, Turkmenistan and Iran formed the top 3 export markets by taking a total share of 31% from the plastic injection machines export.

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
Germany	26,1	13,5	Turkmenistan	1,5	10,5
Austria	12,9	6,7	Iran	1,3	9,3
Japan	7,6	3,9	Bulgaria	1,1	8,1
S.Korea	7,2	3,7	Russian Fed	1,0	7,5
Taiwan	6,5	3,4	Romania	0,9	6,4
Italy	3,3	1,7	Azerbaijan	0,7	5,3
Switzerland	3,3	1,7	Germany	0,6	4,4

Canada	2,0	1,0	Iraq	0,4	3,1
France	0,7	0,3	Georgia	0,4	2,8
10 Total	**191,4**	**99,2**	**10 Total**	**9,6**	**68,8**
Countries	**1,5**	**0,8**	**Countries**	**4,4**	**31,2**
Total	**192,9**	**100,0**	**Total**	**14,0**	**100,0**

Table 7: Foreign Trade of Injection Machines by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

5.3. PLASTICS EXTRUSION MACHINES

In 2020, 75 million dollars of production, 125 million dollars of imports, 38 million dollars of export and 163 million dollars of domestic market sales were realized in plastic extrusion machines.

In this period, foreign trade deficit in plastic extrusion machines was 87 million dollars. In this period, it is seen that 61% of the domestic sales (investment in extrusion machines of the sector) in plastic extrusion machines were met by imports and the ratio of exports to imports was 30%.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	61	79	75	-5	3,6
Imports	111	62	125	101	1,9
Exports	30	39	38	-5	3,6
Domestic Sales	142	102	163	60	2,3
Foreign Trade Deficit	-81	-23	-87	283	1,3
Imports/Domestic Sales (%)	79	61	77		
Exports /Imports (%)	27	63	30		

Table 8: Extrusion Machines Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

98% of the total imports of plastic extrusion machines in 2020 were made from 10 countries. Germany took 44%, China 19% and Italy 14% of total imports.

In the same period, 56% of the plastic extrusion machinery exports were made to 10 countries, while the Russian Federation, Germany and Poland made up the top 3 largest export markets by taking a total share of 31% from plastic extrusion machinery exports.

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
Germany	55,4	44,4	Russian Fed	6,0	15,9
China	23,5	18,8	Germany	3,4	9,0
Italy	17,0	13,6	Poland	2,1	5,6

Austria	12,8	10,3	Romania	1,8	4,8
Taiwan	5,7	4,6	Egypt	1,5	4,0
S.Korea	2,4	1,9	Ukraine	1,5	3,9
Switzerland	1,8	1,4	Azerbaijan	1,3	3,4
France	1,6	1,3	USA	1,2	3,1
India	1,3	1,1	Ethiopia	1,2	3,1
Çekya	0,8	0,6	Iran	1,1	3,0
10 Total	**122,3**	**97,9**	**10 Total**	**21,0**	**55,9**
Others	**2,6**	**2,1**	**Others**	**16,6**	**44,1**
Total	**125,0**	**100,0**	**Total**	**37,7**	**100,0**

Table 9: Foreign Trade of Extrusion Machines by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

BLOW MOLDING MACHINES

In 2020, 14 million dollars of production, 29 million dollars of imports, 6 million dollars of export and 37 million dollars of domestic market sales were realized in plastic blow molding machines.

During this period, foreign trade deficit in plastic blow molding machines was 23 million dollars. While 78% of domestic consumption was met by imports in 2020, 19% of production was exported.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	1	5	14	181	46,0
Imports	17	12	29	146	8,7
Exports	1	2	6	181	46,0
Domestic Sales	18	15	37	153	12,5
Foreign Trade Deficit	-17	-10	-23	138	5,5
Imports/Domestic Sales (%)	95	80	78		
Exports /Imports (%)	3	17	19		

Table 10: Blow Molding Machines Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

21% of plastic blow molding machines imports from 10 countries in 2020 were realized from India and 16% from Japan. Italy and Germany each took a 15% share from the total imports.

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
India	6,0	20,6	Libya	0,9	15,4
Japan	4,7	16,3	Iraq	0,7	12,6

Italy	4,3	14,8	Iran	0,6	10,6
Germany	4,2	14,6	Romania	0,6	9,9
China	3,7	12,8	Turkmenistan	0,3	5,9
France	2,7	9,2	Italy	0,3	5,0
Switzerland	2,3	7,9	Togo	0,3	4,8
Poland	1,1	3,8	Ghana	0,3	4,8
USA	0,1	0,3	Kotdivuar	0,3	4,5
			BAE	0,2	4,1
Total	**28,9**	**100,0**	**10 Total**	**4,3**	**77,7**
			Others	**1,2**	**22,3**
			Total	**5,6**	**100,0**

Table 11: Foreign Trade of Blow Molding Machines by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

In this period, 78% of the 4.3-million-dollar plastic blow molding machines export was realized to 10 countries, and Libya, Iraq and Iran had a 38% share of the total export.

5.4. THERMOFORM MACHINES

In 2020, 36 million dollars of production, 12 million dollars of imports, 14 million dollars of exports and 34 million dollars of domestic market sales were realized in plastic thermoforming machines. In this period, foreign trade surplus in plastic thermoforming machines was 2 million dollars.

In this period, it is seen that 37% of the domestic sales (investment in thermoforming machines of the sector) in plastic thermoforming machines were met by imports.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	30	44	36	-19	2,7
Imports	9	6	12	116	4,6
Exports	12	18	14	-19	2,7
Domestic Sales	28	32	34	5	3,4
Foreign Trade Deficit	3	12	2	-84	-5,7
Imports/Domestic Sales (%)	34	18	37		
Exports /Imports (%)	129	306	115		

Table 12: Thermoform Machines Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

99% of the total thermoforming machines imports in 2020 were made from 10 countries. Imports from Italy, China and Taiwan made up 82% of total imports.

In the same period, 62% of the total thermoforming machines export destined to 10 countries, and the Russian Federation and Nigeria received 23% of the total export

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
Italy	4,6	37,3	Russian Fed	1,7	12,0
China	3,6	28,9	Nigeria	1,6	11,1
Taiwan	1,8	14,5	Belarus	0,9	6,2
Germany	0,8	6,5	Portugal	0,9	6,0
S.Korea	0,5	4,3	USA	0,7	5,2
India	0,5	4,0	S.Africa Rep.	0,7	5,0
Switzerland	0,1	1,1	Iran	0,7	4,6
Poland	0,1	0,9	Ukraine	0,6	4,0
Japan	0,1	0,7	Kazakhstan	0,6	4,0
Lebanon	0,1	0,5	Kirgizstan	0,6	3,8
10 Total	**12,3**	**98,7**	**10 Total**	**8,9**	**61,9**
Others	**0,2**	**1,3**	**Others**	**5,5**	**38,1**
Total	**12,4**	**100,0**	**Total**	**14,3**	**100,0**

Table 13: Foreign Trade of Thermoform Machines by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

5.5. PRESSES AND OTHER MACHINES

In 2020, 212 million dollars of production, 192 million dollars of imports, 85 million dollars of exports and 319 million dollars of domestic market sales were realized in the press and other machinery sector. The foreign trade deficit in presses and other machines during this period was 107 million dollars.

In this period, 60% of the domestic sales (investments in presses and other machines) of presses and other machines were met by imports.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	152	235	212	-10	5,6
Imports	204	202	192	-5	-1,1
Exports	61	94	85	-10	5,6
Domestic Sales	296	343	319	-7	1,2
Foreign Trade Deficit	-144	-108	-107	-1	-4,7
Imports/Domestic Sales (%)	69	59	60		

Exports /Imports (%)	30	47	44

Table 14: Presses and Other Machine Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

Imports from 10 countries in 2020 constituted 91% of the total presses and other machinery imports. China, Germany, and Austria have a share of approximately 68% of the total press imports.

In this period, 48% of the total press export destined to 10 countries. Exports to the Russian Federation, India and the USA constituted 23% of the total exports.

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
China	56,4	30,3	Russian Fed	9,8	11,6
Germany	52,7	28,3	India	5,4	6,4
Austria	17,8	9,6	USA	4,6	5,5
Italy	16,0	8,6	Algeria	3,7	4,4
Taiwan	9,5	5,1	Uzbekistan	3,5	4,1
USA	4,4	2,4	S. Arabia	3,0	3,5
Thailand	3,4	1,8	Romania	2,9	3,5
S.Korea	2,9	1,6	Iran	2,8	3,4
Switzerland	2,8	1,5	Spain	2,7	3,2
Denmark	2,6	1,4	S.Africa Rep.	2,5	3,0
10 Total	**168,6**	**90,6**	**10 Total**	**41,0**	**48,4**
Others	**17,4**	**9,4**	**Others**	**43,6**	**51,6**
Total	**186,0**	**100,0**	**Total**	**84,6**	**100,0**

Table 15: Foreign Trade of Presses and Other Machines (2020)
Source: Turk Stat and ITC Trade Statistics

5.6. PARTS & COMPONENTS

In 2020, 88 million dollars of production, 52 million dollars of imports, 39 million dollars of exports and 110 million dollars of domestic market sales were realized in the parts and components sector. During this period, the foreign trade deficit in parts and parts was 13 million dollars.

It is seen that 47% of the domestic sales (parts and parts investment of the sector) in parts and components in the said period were met by imports.

	2015	2019	2020	% Increase 2020/2019	CAGR % 2020/2015
Production	77	110	98	-11	4,0

Imports	42	38	52	36	3,3
Exports	19	28	39	42	12,4
Domestic Sales	100	121	110	-9	1,6
Foreign Trade Deficit	-23	-10	-13	20	-9,6
Imports/Domestic Sales (%)	42	32	47		
Exports /Imports (%)	46	72	76		

Table 16: Parts and components Supply and Demand Equilibrium (Million $)
Source: Turk Stat and ITC Trade Statistics

In 2020, imports of parts and components from 10 countries constituted 87% of total imports. Germany, China, and Italy took 61% of the total imports.

In the same period, 74% of the total parts and components exports were directed to 10 countries. Germany has a share of 48% in total parts and components exports.

Imports			Exports		
Countries	**1000 $**	**%- Share**	**Countries**	**1000 $**	**%- Share**
Germany	17,4	30,4	Germany	18,7	47,7
China	11,3	19,7	Çekya	2,3	5,8
Italy	6,6	11,4	Iran	1,3	3,3
USA	3,9	6,7	Russian Fed	1,3	3,2
France	2,7	4,7	USA	1,2	3,0
Switzerland	2,4	4,1	Poland	1,2	2,9
Austria	2,3	4,0	Switzerland	0,8	2,1
Luxembourg	1,6	2,8	Romania	0,7	1,9
Netherlands	1,0	1,8	Austria	0,7	1,8
Canada	1,0	1,8	India	0,7	1,8
10 Total	**50,2**	**87,4**	**10 Total**	**28,8**	**73,5**
Others	**7,2**	**12,6**	**Others**	**10,4**	**26,5**
Total	**57,4**	**100,0**	**Total**	**39,1**	**100,0**

Table 17: Foreign Trade of Parts and Components by Countries (2020)
Source: Turk Stat and ITC Trade Statistics

6. MAIN PROBLES OF THE INDUSTRY

General problems in the machinery manufacturing industry, can also be applied to the plastic processing machines industry. In addition to these general problems, the major problems faced by the plastics processing machines can be summarized as follows.

- There is no national strategy for plastic processing machines. The sector has no specific vision

- Turkey, as for plastic processing machinery has a profoundly serious investing plastics industry. Thus, Turkey is one of the world's most important market in this area. But 70% of the market is dominated by imported machines.
- 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 plastic processing machinery sector, adequate protection of domestic producers and provide competitive advantages of plastic products manufacturer, they choose the second-hand imports of machinery.
- There is a serious place problem in the sector. Machine and component manufacturers generally operate in physically small and inadequate spaces. If they want to move to larger places, they must bury already limited working capital in high rent. The need for organized and rent-free industrial land is at an advanced stage in the sector.
- 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.
- 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.

7. SUGGESTIONS

The PAGEV Value Chain relationship, which is supported by a strategic decision with the added value, employment and multiplier effect created by the domestic production, is especially important for our machinery / equipment and mold industry. Without these, net foreign currency inflows could not be provided to the country, and technology security and business sustainability would be a problem. With a strategic decision, domestic production should be supported by the added value, employment, and multiplier effect it creates.

Although there are support mechanisms such as R&D Centers of the Public, Technological Product Experience Certificate, Technology Development Zones, Technological Product Investment Support Program, Design Center Support Program, Technology, and Innovation Support Program, more are needed.

The purchase of locally produced machines in public should not be left with only 15%. If necessary, it must be made compulsory. Tax supports should also be brought to companies that purchase domestic goods.

Preventing unfair competition and protecting domestic production, poor quality / unhealthy machine entries and market surveillance should be done. These audit institutions should be established within our body. It is possible to list the things to be done as follows.

i. **Review of Product Standards**

To increase the quality of the domestic market and to expand the target markets in exports, it is necessary to comply with the Machinery Directives of the European Union and make necessary arrangements.

ii. Cooperation in Market Audit and Surveillance Activities

To get expert opinion about the sector and to follow up-to-date trends, it will be beneficial to participate in sectoral collaborations that can provide neutral opinion to the market audit and surveillance organization.

iii. Establishing Control Points at Customs

The import of products that do not comply with the directives / standards from third world countries reduces domestic production quality and endangers user safety. For this reason, as in the European Union countries, inspection should start from customs. Standards that should be prevented at customs should be determined and products that do not comply with the standards should not be allowed to enter the country. Declarations stating the technical suitability of the products should be inspected in customs procedures.

iv. Creating a Banned Company Database

As applied in the European Union, all customs points must have access to this database. Providing the list of currently banned companies owned by the European Union and adding it to the database will also contribute positively to customs inspections.

v. Establishing a Product and Performance Oriented Incentive Mechanism

The product-oriented incentive application in the sector should continue in detail. In addition, the incentive should be performance oriented. (For example, the opportunity to exchange foreign currency more specifically for the exporter, the increase of R&D incentives)

vi. **The Industry Land Need of the Sector Should Be Solved**

Firms that produce added value with R&D should be provided with 49 years of lease-free allocation, owned by the state, in areas where they can employ quality and not far from the cities. Machinery and parts manufacturers generally operate in physically small and inadequate spaces. When they want to move to larger places, they must bury their already limited working capital in the land with high rent. The sector urgently needs an industrial land that is organized and away from rent.

vii. Firm's Financial Needs Should Be Solved

Firms' financing needs should be supported by an increasing Exim bank activity abroad and an incentive financing model at home. (R&D and capacity to create added value may be performance criteria). On the other hand, industrial banking and project finance should be developed domestically.

viii. Improving Vocational Education

To improve Vocational Education, quality oriented, applied education should be targeted. Supporting technicians from abroad, facilitating access to information and building a Center of Excellence.

ix. Establishment of Common Service Providers in Overseas Export Markets

In countries where the machinery is exported, cooperation should be made where Turkish SMEs will provide common technical services to their customers. Exporter Union resources should be mobilized for the necessary financing.

x. Prevention of Unfair Competition

To prevent unfair competition, cooperation should be established with non-governmental organizations such as PAGEV, and standards and supervision mechanisms for entry into the sector should be established.

xi. Creation of Workplace and Machine Database

Registration of workplace (product number of employees, etc.) and machine features (age, brand, country of purchase, etc.) in the machine manufacturing sector, by tightening the workplace and product inspections, will reduce the number of companies operating in the sector.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