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TURKISH PLASTICS INDUSTRY FOUNDATION

TURKISH

PLASTICS PACKAGING MATERIALS

REPORT

2016

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EXECUTIVE SUMMARY

Production of plastic packaging products share between 40 – 53 % in total plastics products manufacturing of leading countries. This ratio is about 40 % in Turkey, while the World average is 46 % respectively. More than 1/3 of all products in developed countries is packaged with a plastic materials so that after the paper and cardboard is having the biggest market share. In terms of volume, 55 % of the packaging is flexible and 45 % is rigid However, this position is reversed in terms of value. Annual consumption value of rigid packaging is 30 billion euros in the European while flexible packaging shares the value of around 10 billion euros.

In 2016 compared to 2015, regarding with the plastic packaging materials on amount base; Increase of 3.8 % in production, 1.1 % in imports, 6.6 % in exports, 2.7 % in domestic consumption and 12.7 % in foreign trade suplus is expected. In this perod, 24 % of the total production to be exported and export – Import covarage ratio to realise as 201 % is expected.

On the other hand on value base; İIncrease of 2.5 % in production, 2.4 % in imports, 1.2 % in exports, 2.7 % in domestic consumption and decline of 2.6 % in foreign trade suplus is expected. In this period 19 % of the total production to be exported, 15 % of domestic sales to be met by imports and and export – Import covarage ratio to realise as 128 % is expected.

World packaging industry is very large and big industries and the plastic packaging industry has an important place in the economies of the countries. In parallel with the rapid development of plastic packaging, plastic industry has become an essential part of our daily lives. Key to this success, is the best way to maintain supply capability and low weight due to the cost savings as a result.

Plastics, through innovative technologies, are becoming increasingly sophisticated, lightweight, versatile and has replaced the traditional packaging materials such as glass and paper in many areas. Previously, classical materials such as paper, glass, and traditional packaging materials such as wood, cellulose acetate and cellophane transparent cellulose film were used, plastic packaging materials placed with polyethylene in the 1950's and has been widely used. Rapid increase in the use of plastics has been realized with the development of polystyrene, polypropylene, PVC, polyester and polyethylene copolymers.

Despite the size and economic importance of the industry (especially SMEs) of the plastic packaging industry is currently under significant pressure two. On the one hand to determine the price of plastic raw material suppliers, notably in the food industry as well others, great pressure is applied to the lowering of prices by customers. In addition, in many countries, especially in Eastern Europe, particularly if they have a quality manufacturer of extrusion and printing facilities at lower costs and therefore competition in these countries are known to increase rapidly. Competition from others, especially from the

Far East side barrier material and printing technology is a growing field.

Innovation is also an important factor in its success in this sector. Companies that use R&D intensively in the plastic packaging industry to develop new products that are easy to use for the market will have a strategic advantage compared to their competitors. In developed countries, the plastic packaging industry makes use of R&D to open new markets both in the packaging sector and in similar areas.

1. PACKAGING INDUSTRY

1.1. THE FUNCTIONS OF PACKAGING

The packaging materials which wrapping, storing, carrying and selling by reliable and in a most hygienic way, are defined as the elements that increase the added value of products. From this point of view, the development and increasing per capita consumption of packaging industry in general and the sophistication of packaging consumption is one of the most important indicators of the development of the country.

The functions of the packaging are outlined as follows;

- Protection function,
- Carrying function ,
- Providing information function,
- Advertising to function,
- Storage function,
- Ease of usage function,
- Quantity function,
- Sales increase function.

1.2. TYPES OF PACKAGING

The packaging types can be divided into 6 section according to the materials used in manufacturing;

I. Wood Packaging
ii. Glass Packaging
iii. Paper and Paperboard Packaging
Iv. Composite Packaging
v. Metal Packaging
Vi. Plastic Packaging

- ✓ Pet (Polyethylene Terephthalate) Packaging
- ✓ PVC (Polyvinylchloride) Packaging
- ✓ PP (Polypropylene) Packaging
- ✓ PSI (Polystyrene) Packaging

- ✓ PE (Polyethylene) Packaging
- ✓ HDPE (High Density Polyethylene) Packaging
- ✓ LDPE (Low Density Polyethylene) Packaging
- ✓ PC (Polycarbonate) Packaging

WOOD PACKAGING

The wooden packing packaging materials as the world's oldest packaging are widely used in the packaging of fresh fruits and vegetables due to the hardness, durability heavy burden of fragile and the ventilation features. Today, the wood is no longer used as a packing small production units in a simple manner.

GLASS PACKAGING

Glass packages have structure of bright, smooth and easy to clean. Therefore it does not contain germs. They are economical packaging materials since can be used repeatedly. The glass packaging materials are preferred by the food, drugs and perfumery manufacturers due to the no chemicals reaction, high barrier properties and ease of sterilization. The disadvantages of glass packaging are weight problems and fragility.

PAPER AND PAPERBOARD PACKAGING

Paper and paperboard materials are highly preferred in packaging due to the ease and economics of manufacturing. This kind of packaging materials are subjected to various treatments because of stiffness, explosion protection, humidity and not enough water barrier characteristics.

COMPOSITE PACKAGING

Composite packaging materials are obtained by combining the full surface of at least two different materials. The main reason to use of different materials is to increase the durability and flexibility by combining the unique properties of the materials. For example : plastic - aluminum composite packaging, cardboard -polyethylene composite packaging, paper - polyethylene composite packaging, paper - plastic - aluminum composite packaging, paper - aluminum composite packaging . These packages are usually used in our homes for ready soup, fruit juices. They are cheaper and lighter and also have variety of manufacturing covers.

METAL PACKAGING

Metals are used for the packaging of paint and chemicals. The various organic coatings are developed for the deterioration materials inside. The cans manufactured by aluminum and

steel metal are used in the packaging of gas and non-carbonated beverages. Metal packaging creates a strong barrier against light, air and water and they are sufficiently strong and resistant for insects and rodents. Although the use of metal is increasing in beverage and food packaging, it began its place to plastics in the household and automotive industry.

PLASTICS PACKAGING

Plastic packaging materials are usually obtained by processing the petrochemical plants of various products from oil refineries. Plastics are preferred in packaging materials production since more packages can be produced with lower plastics and its easy shaping characteristics.

Plastic packaging is not only practical and safe, but at the same time it is much more efficient. The exact amount of improvement in the past is stated in a study conducted by GVM, (a German market research institute on packaging) comparing the packaging produced in 2013 with the packaging produced in 1991. The striking result of the work is that in Germany, only 2.76 million tons of plastic is consumed instead of 3.7 million tons for packaging, which almost equates to a million tonnes of savings. This material savings has been achieved despite tighter legal requirements for innovative packaging solutions, trade and consumers 'increased demands for food products' fragmentability and durability.

Approximately 63 % of all consumer goods in the EU are sold in plastic packaging. By contrast, plastic packaging accounts for only 24 % of the total package weight. This clearly demonstrates the high material yield of the plastic as a packaging tool.

PET (POLYETHYLENE TEREPHTHALATE) PACKAGING

It is a thermoplastic material of polyester family. It is available in amorphous (transparent) and semi-crystalline (opaque and white) materials, depending on the heat treatment. The most important advantage is that it can be completely recycled. It can be semi-rigid and rigid depending on thickness. It's too light. It is used as a good gas and humidity bar. It is rigid and resistant to impact. It is naturally colorless and transparent. When produced as a thin film, PET is often coated with aluminum; Reflective and opaque. PET bottles are excellent barrier material and have a very wide area especially for soft drinks. In various sizes, drinking water, carbonated beverages, fruit juice and vegetable oil bottles, peanut oil jar, microwave food tray cover, salad containers are the main areas used

PVC (POLYVINYL CHLORIDE) PACKAGING

There are two types of rigid and flexible PVC materials. Pipes and window frames vegetable oils and shampoo bottles, bleach and transparent liquid detergent containers, liquid motor oil bottles, artificial lees, window cleaning products, fresh meat containers, ketchup bottles, soft toys, electrical insulation, roofing materials are made of PVC

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PP (POLY PROPYLENE) PACKAGING

Chemical substances are resistant to heat and extreme fatigue. They are plastic with moderate hardness and brilliance. Margarine tubes, ketchup bottles, sticks, caps, chips and biscuits, microwave food trays, medicinal bottles, yogurt containers, chairs, suitcases, carpets, ropes and some containers and covers are made of polypropylene plastic. It is the lowest density plastic used in packaging.

PS (POLI STIREN) PACKAGING

It can be rigid and foam, it is a versatile and purpose-built plastic. It is a very hard, brittle and shiny plastic. It is a very inexpensive resin with a relatively low melting point. Protective packaging is made from polystyrene plastic, examples are; egg cartons, coolers, trays, fast food packaging containers, coffee containers, yogurt containers, video and audio cassette containers, cutlery, cups, caps, small boots and dog containers.

PE (POLY ETHYLENE) PACKAGING

It's a kind of plastic we use the most in our homes. There are many uses such as bleach, detergent and shampoo bottles, motor oil bottles, garbage bags. Detergent bottles, trash cans and similar products are made from recycled PE.

HDPE (HIGH DENSITY POLYETHYLENE) PACKAGING

It is a very solid and economical material. Naturally, the milk is in the color look. For this reason, it is not used in products where clarity is important. It is one of the most used plastics. It has a wide range of usage due to its low cost, easy formability and resistance to breakage. Milk, water, fruit juices, liquid detergents, engine oils, laundry waters, shampoos, perfume and lotion containers are made of HDPE, such as plastic tubes, waste bags, casings, cable insulations, buckets, thin carrier bags.

LPDE (LOW DENSITY POLY ETHYLENE) PACKAGING

It is semi-transparent or color. Medium hard and durable plastic. It is a flexible, soft, easily cutable and wrinkle-resistant plastic. Because LDPE plastics are smooth, flexible and relatively transparent, they are mostly used as film raw materials. LDPE plastics are milk-white if pigment is not added. It is also used in the construction of flexible closures of various jars such as sacks, shirring and stretching shirts, film bags, garbage bags, bread and sandwich bags, various food bags, food boxes, deep freezing bags, cheap kitchenware, grocery bags, margarine tubes and various jars are the most idly uses.

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PC (POLY CARBONATE) PACKAGING

Processing, molding and thermoforming of this kinds are easy. Such plastics are plastics which are widely used in the modern manufacturing sector. Polycarbonate is a very durable material, used in making bullet-proof glass. In addition, this polymer is very transparent and light-transmitting structure. It has a better light transmission characteristic than most glass types. The bottles that we use at home are also produced from polycarbonate materials. It is the best feature of this material that it is resistant to bumps.

2. SHARES OF MATERIALS IN PACKAGING PRODUCTION, IMPORTS, EXPORTS AND DOMESTIC CONSUMPTION IN TURKEY

The highest share in total packaging production in Turkey is plastic materials with 70 %. In total production, the shares of materials are: cardboard 9 %, glass 14 %, paper cardboard 8 %, wood 7 %, metal 6 %, composite 6 % and paper 1 % share.

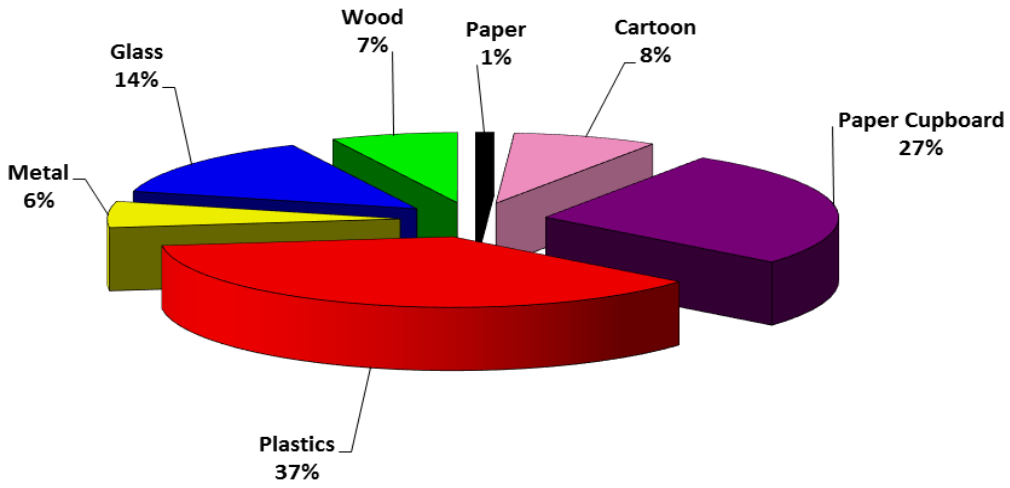

Figure 1: Shares of Materials in Total Packaging Production in Turkey

The highest share in total packaging imports in Turkey is plastic materials with 47 % In total imports, cardboard shares 26 % while glass 3 %, paper cardboard 10 %, wood 1 %, metal 6 %, composite 5 % and paper 2 %.

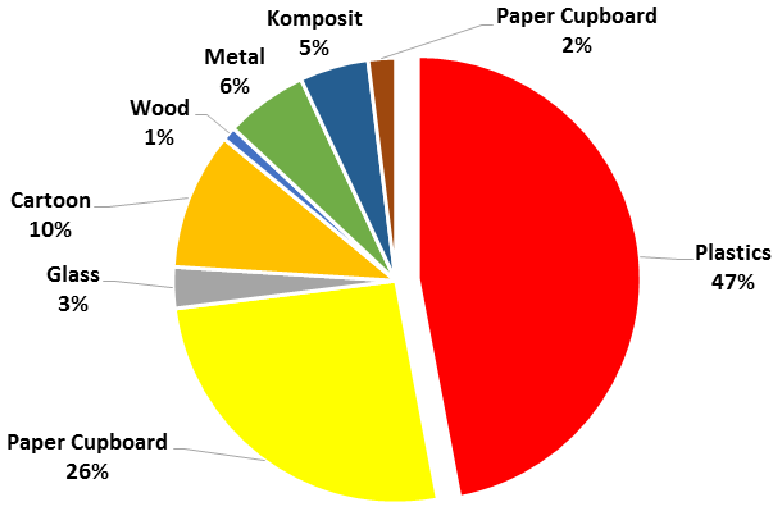

Figure 2: Shares of Materials in Total Packaging Imports in Turkey

The highest share in total packaging exports in Turkey is plastic materials with 70 % In total exports, cardboard shares 9 %, while glass 1 %, paper cardboard 4 %, wood 1 %, metal 8 %, composite 5 % and paper 2 %.

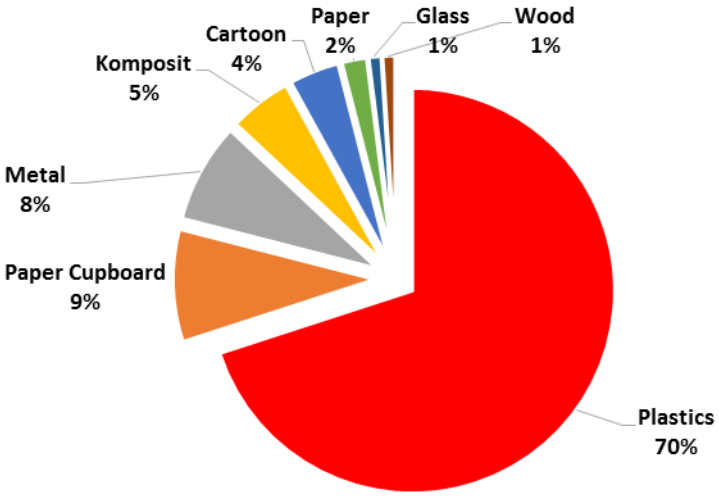

Figure 3: Shares of Materials in Total Packaging Exports in Turkey

On the average of total consumption of packaging materials in Turkey; plastic packaging shares 33 %, cardboard 25 %, glass 13 %, paper cardboard 9 % wood 7 %, metal 6 % composite 5 % and paper 2 %.

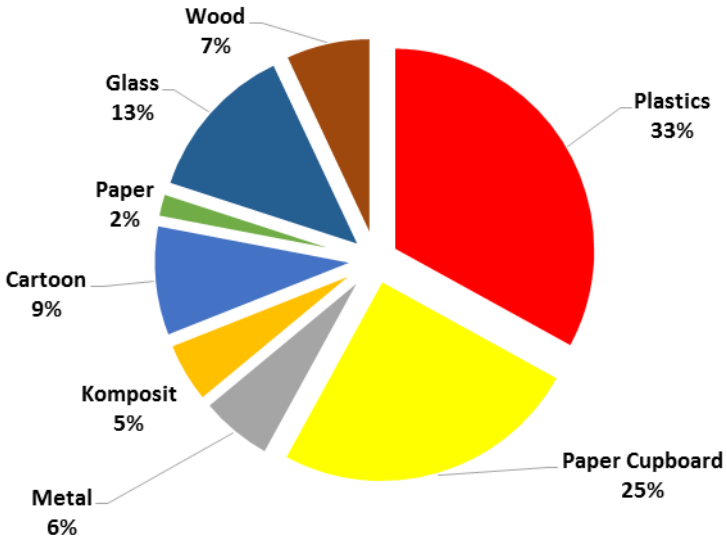

Figure 4: Shares of Plastics Packaging Consumption by Materials in Turkey
Source: ASD

3. PACKAGING MATERIALS CONSUMPTION IN TURKEY

Taking the shares of materials in total packaging consumption into consideration, the consumption of packaging in Turkey has realized as in table below.

	2012	2013	2014	2015	2016	Total 5 Years	Annual Average	% Share
Plastics	2.682	2.938	2.911	3.031	3.031	14.592	2.918	33
Paper Cupboard	2.032	2.225	2.205	2.296	2.296	11.055	2.211	25
Glass	1.057	1.157	1.147	1.194	1.194	5.748	1.150	13
Cartoon	554	607	601	626	626	3.015	603	9
Wood	569	623	617	643	643	3.095	619	7
Metal	488	534	529	551	551	2.653	531	6
Komposit	305	305	305	305	305	1.526	305	5
Paper	34	38	37	39	39	188	38	2
Total	**7.720**	**8.427**	**8.353**	**8.685**	**8.685**	**41.871**	**8.374**	**100**

Table 1: Packaging Consumption in Turkey by Materials (1000 Tons)

4. TURKISH PLASTIC PACKAGING MATERIALS INDUSTRY

4.1. PRODUCTION CAPACITY

In plastic packaging industry, lots of companies manufacture lots of different products, and manufacturing capacities of companies in terms of products cannot be defined over a certain unit. According to the TOBB database, total manufacturing capacity of 1854

registered companies is defined as: (1.188.2008 tons + 2.626.400.207 m2 + 421.630.400 meters + 4.497.991 pieces)

Turkish plastic packaging industry is made up of flexible plastic by 67 %, textile plastics by 18 %, and hard plastic packaging products by 15 %.

Products	No of Companies	Ton	m^2	Meter	1000 Unit
Plastic Film	205	200,639	1,036,345,507	421,630,400	
Sheets	137	128,243	342,572,240		
Bottles and cans	235	86,589			2,008,991
Storage Containers	543	279,737			1,648,000
Packings Bags	734	493,000	1,247,482,460		841,000
TOTAL	1,854	1,188,208	2,626,400,207	421,630,400	4,497,991

Table 2: Installed Capacity of Plastics Packaging Industry
Source: TOBB (The Union of Cahmbers and Commodity Exchange of Turkey)

According to PAGEV data base, about 1.450 companies are operating in plastics packaging matrials industry, 61 % of which located in Istanbul. More than 10 companies that operate in 14 the provinces 14 account for 83 % of total companies.

Province	No of Companies	% Share
İstanbul	871	61
İzmir	84	6
Konya	57	4
Ankara	51	4
Bursa	51	4
Gazıantep	42	3
Kocaeli	40	3
Adana	27	2
Denızlı	23	2
Mersin	17	1
Kayseri	16	1
Manısa	15	1
Samsun	13	1
Antalya	11	1
Others	105	7
Total Industry	1,423	100

Table 3: Plastics Packaging Materials Manufacturers by Provinces
Source: PAGEV Data Base

4.2. PLASTICS PACKAGING PRODUCTION

Total manufacturing of plastic packaging materials, which was 3.3 million tonnes and USD billion of 10.9 in January – November period of 2016 is expected to increase to 3.6 million tones and USD 11.9 billion by the end of the year, increasing by 4 % on amout base and 3 % on value base compared to 2015.

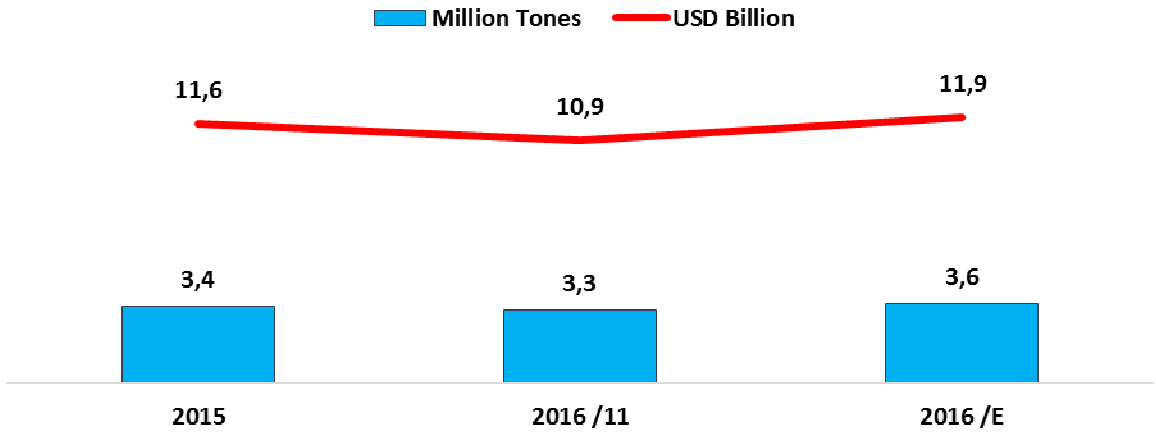

Figure 5: Plastics Packaging Materials Production
Source: TurkStat

The share of plastic packaging sector in total packaging industry is 37 %.

4.3. PLASTICS PACKAGING PRODUCT FOREIGN TRADE

Plastics packaging foreign trade can be examined by 5 custom duty code numbers specified as follows with HS Codes of 39.19, 39.20, 39.21 ve 39.23.

HS CODE	Definitions
3919	Adhesive plate, sheet, strip, slide, etc. from plastic; flat
3920	Other plate, sheet, pellicule and slides from plastic
3921	Other plates, sheets, pellicules, foils and slides from plastic
3923	Plastic products for moving furniture, tap, cap, capsule

Table 4: The Materials Groups of Plastics Packaging Industry
Source: Turk Stat

4.4. PLASTICS PACKAGING PRODUCTS IMPORTS

Although Turkish plastics packaging is sufficient to meet the requirements of requirements of the domestic manufacturing industry with its structural and technological aspects, the materials are imported come with their own packaging materials. As new products begin to be manufactured in Turkey, their packaging materials will be produced in Turkey and market volume will grow accordingly. The share of total imports of plastics packaging industry is 47 % in total packaging imports.

The imports of plastics packaging materials realised as 395 thousand tons and stood at USD billion of 1.6 in the January – November period of 2016. It is expected to increase to 430 thousand tons and USD 1.8 billion by the end of the year increasing by 1.1 % on amount and 2.4 % on value base compared to 2015.

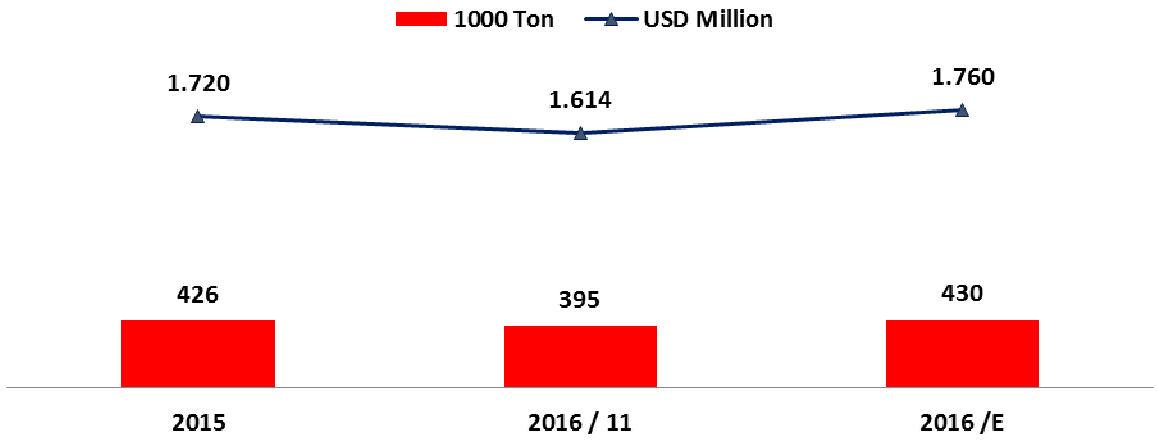

Figure 6: Plastics Packaging Material Imports
Source: TurkStat

The imports of all plastics packaging materials increased both on amount and value bases by the end 2016 compare to 2015.

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	57	53	58	0,4
3920	256	227	248	-3,1
3921	65	59	64	-1,9
3923	47	56	61	28,8
Total	426	395	430	1,1

Table 5: Plastics Packaging Material Imports (1000 Tons)
Source: TurkStat

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	323	306	333	3,3
3920	922	831	907	-1,7
3921	254	229	250	-1,6
3923	221	248	270	22,3
Total	1.720	1.614	1.760	2,4

Table 6: Plastics Packaging Material Imports (USD Million)
Source: TurkStat

Plastics packaging materials imports, sharing 73 % of total plastics industry's imports on amount base and receiving 60 % share on value base in the January - November period of 2016.

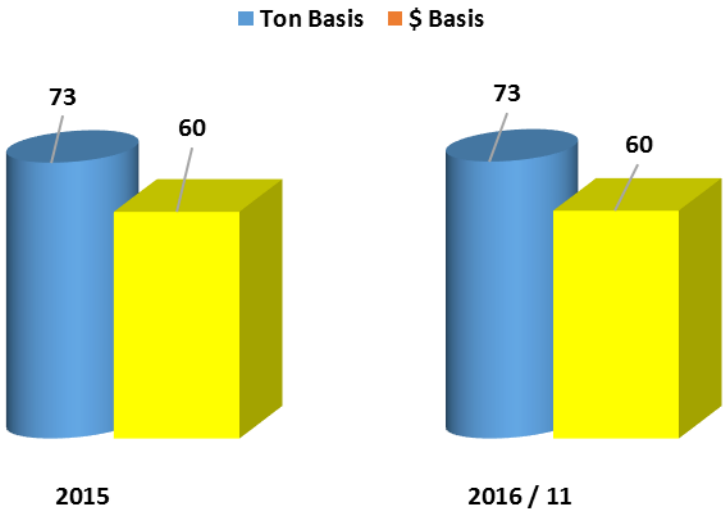

Figure 7: Share of Plastics Packaging Imports in Total Plastics End Products Imports (%)

Plastic packaging products are imported from more than 80 countries. The share of top 10 import partners within total imports realised as 72 % on amount base and 74 % on value base in the January – November period of 2016. 5 major import partners in this perod are Germany, China, S. Korea, Italy and France.

Countries	1000 Tons	USD Million	Ton - %	$ - %
Germany	65	315	16	20
China	93	273	24	17
S.Korea	27	158	7	10
Italy	36	137	9	8
France	17	81	4	5
USA	8	69	2	4
UK	8	57	2	4
Belgium	12	52	3	3
Greece	10	30	3	2
Spain	8	30	2	2
Total 10 Countries	284	1.200	72	74
Others	111	413	28	26
Tota	395	1.614	100	100

Table 7: Plastics Packaging Materials Imports by Countries (2016/11)
Source: TurkStat

4.5. PLASTICS PACKAGING MATERIALS EXPORTS

According to the ASD - Packaging Manufacturers Association records, the share of total exports of plastics packaging industry is 70 % in total packaging imports.

Plastics packaging materials exports in the January – November perod of 2016 realized as

792 thousand tons and USD billion of 2,1 and expected to be 864 thousand tons and USD billion of 2.3 by the end of the year increasing by 6.6 % on amount and 1.2 % on value base compared to 2015.

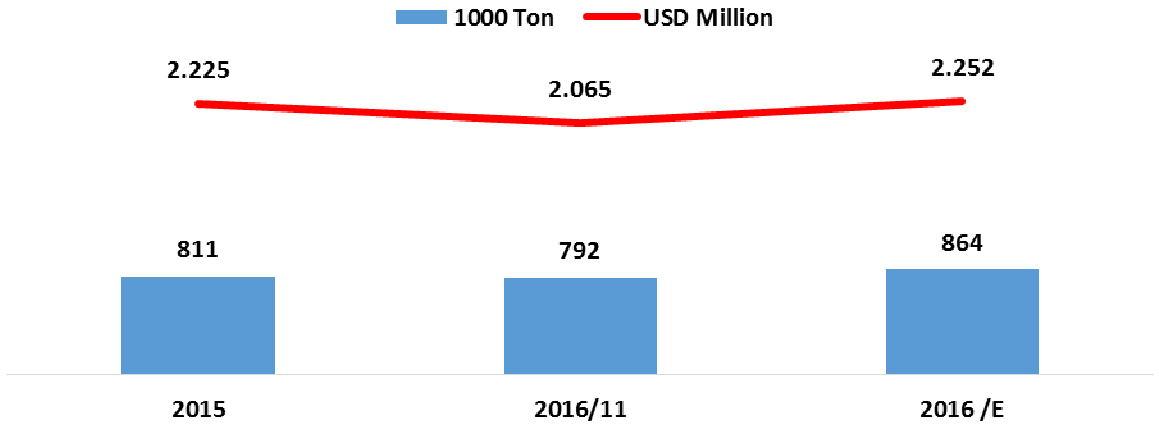

Figure 8: Plastics Packaging Materials Exports

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	19	18	20	1,2
3920	339	339	370	9,2
3921	129	127	139	8,0
3923	324	308	336	3,7
Total	811	792	864	6,6

Table 8: Plastics Packaging Materials Exports (1000 Tons)
Source: TurkStat

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	115	105	114	-1,0
3920	915	849	926	1,2
3921	386	368	402	4,2
3923	809	743	811	0,2
Total	2.225	2.065	2.252	1,2

Table 9: Plastics Packaging Materials Exports (Milyon $)
Source: TurkStat

Plastic packaging materials exports, sharing 51 % of total plastics industry exports in amount and value base in 2015, increased to 56 % on amount and 55 % on value base in the first half of 2016.

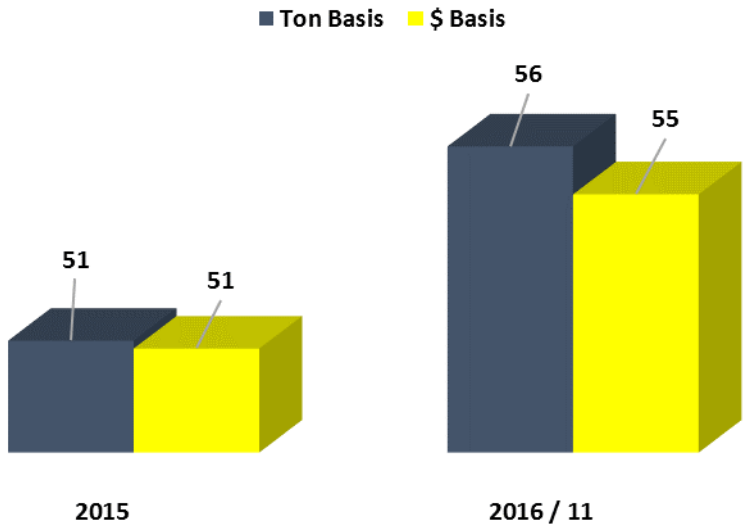

Figure 9: Share of Plastics Packaging Exports in Total Plastics End Products Exports (%)

Turkey exports plastic packaging products to more than 150 countries, and 10 major export partners had 49 % on amount and 47 % share on value base in January- November period of 2016. In this period, Germany, UK, Iraq, France and Italy kept their status of top 5 markets, to which we exported plastic packaging products most.

Countries	1000 Tons	USD Million	Ton - %	$ - %
Germany	56	180	7	9
UK	62	142	8	7
Iraq	77	136	10	7
France	29	91	4	4
Italy	35	86	4	4
Israel	38	80	5	4
Iran	21	74	3	4
Netherland	21	69	3	3
Bulgaria	26	60	3	3
Romain	22	58	3	3
Total 10 Countries	386	977	49	47
Others	406	1.087	51	53
Total	792	2.065	100	100

Table 10: Major Export Partners for Plastics Packaging Materials (2016/11)
Source: TurkStat

4.6. BALANCE OF TRADE IN PLASTIC PRODUCTS

Turkey has foreign trade surplus in terms of amount and value in total foreign trade of plastic packaging products. The foreign trade surplus realized as 398 thousand tons and USD 415 million in the January - November period of 2016.

The foreign trdae surplus is expected to be 434 thousand tons and USD 492 million at the end of 2016, increasing by 13 % on amount base and decreasing by 3 % on value base compared with 2015.

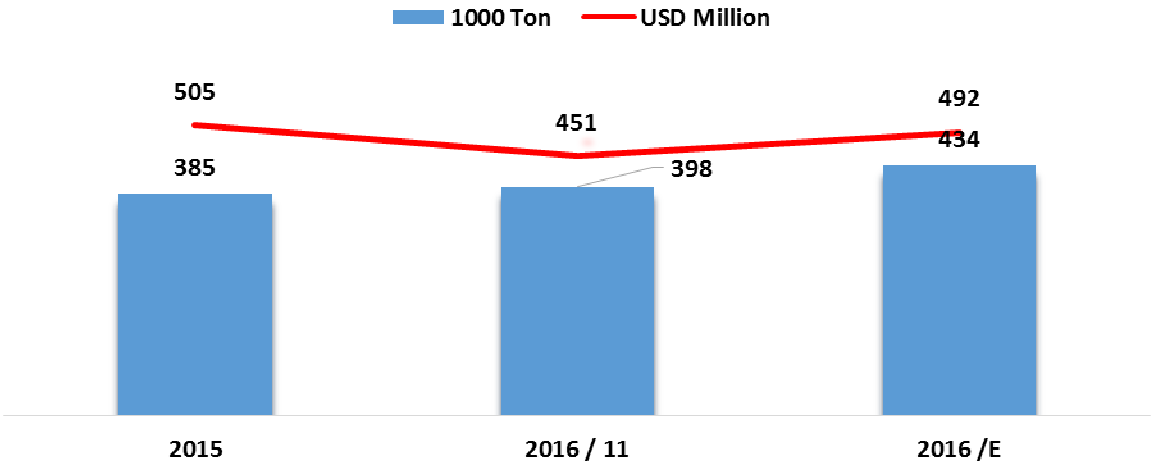

Figure 10: Plastics Packaging Materials Foreign Trade Surplus

By the end of 2016, it is expected that the surplus of foreign trade will increase in all sub groups other than HS codes of 3923 GTIP on amount basis, and will decrease in HS codes of 3920 and 3923 on value basis compared to 2015.

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	-38	-35	-38	-
3920	83	112	122	47
3921	63	69	75	18
3923	277	253	275	-1
Total	385	398	434	13

Table 11: Foreign Trade Equilibrium in Plastics Packaging Industry (1000 Tons)
Source: TurkStat

HS Code	2015	2016/11	2016 (E)	% Increase 2016/2015 (E)
3919	-143	-201	-219	6
3920	141	17	19	-353
3921	181	139	152	15
3923	620	495	540	-8
Total	799	451	492	-3

Table 12: Foreign Trade Equilibrium in Plastics Packaging Industry (USD Million)
Source: TurkStat

4.7. FOREIGN TRADE PRICES IN PLASTIC PACKAGING PRODUCTS

Average import prices of plastic packaging products have been over the average export prices in Turkey since 2000. This shows that Turkey imports plastic packaging products with higher added-value while exporting products with lower added-value.

Average import unit price realised as 4,1 $/kg and average export unit price 2,6 $/kg for plastic packaging materials in the January – November period of 2016. The import prices increased by 1.2 % and export price declined by 5 % compared to 2015.

Figure 11: Plastics Packaging Materials Average Unit Foreign Trade Prices

In the January – November period of 2016, import prices of all materials increased other than HS codes of 3923 and export prices of all materials declined.

HS Code	Unit Import Prices			Unit Export Prices		
	2015	2016/11	% Increase	2015	2016/11	% Increase
3919	4,5	5,78	2,9	5,9	5,8	-2,3
3920	3,0	3,66	1,5	2,7	2,5	-7,3
3921	3,1	3,90	0,3	3,0	2,9	-3,6
3923	4,0	4,45	-5,1	2,5	2,4	-3,4
Average	3,3	4,09	1,2	2,7	2,6	-5,0

Table 13: Unit Foreign Trade Avarage Prices for Plastics Packaging Materials ($/kg)
Source: TurkStat

4.8. PLASTIC PACKAGING MATERIALS DOMESTIC CONSUMPTION

The domestic market consumption of plastic packaging materials has been realized as 2.9 million tons and 10.5 billion dollars in January-November period of 2016. The consumption is expected to be 3.1 million tons and 11.4 billion dollars at the end of 2016 increasing by 3.3 % on amount basis and 2.7 % on a value basis compared to 2015.

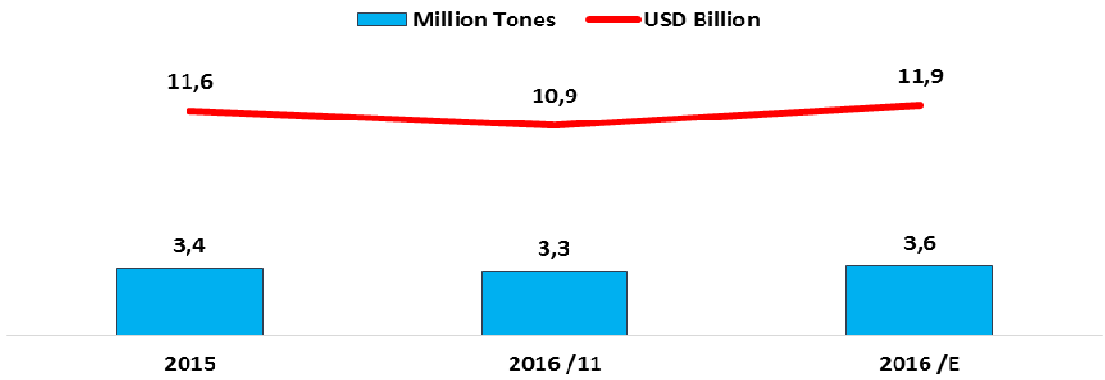

Figure 12: Plastics Packaging Materials Domestic Consumption

4.9. SUPPLY AND DEMAND BALANCE IN PLASTICS PACKAGING INDUSTRY

In 2016 compared to 2015, regarding with the plastic packaging materials on amount base;

- ✓ Increase of 3.8 % in production, 1.1 % in imports, 6.6 % in exports, 2.7 % in domestic consumption and 12.7 % in foreign trade suplus is expected.
- ✓ In this perod, 24 % of the total production to be exported and export – Import covarage ratio to realise as 201 % is expected.

On the other hand on value base;

- ✓ Increase of 2.5 % in production, 2.4 % in imports, 1.2 % in exports, 2.7 % in domestic consumption and decline of 2.6 % in foreign trade suplus is expected.
- ✓ In this period 19 % of the total production to be exported, 15 % of domestic sales to be met by imports and and export – Import covarage ratio to realise as 128 % is expected.

	1000 Tons				USD Million			
	2015	2016/11	2016/E	% Increase (2016/2015)	2015	2016/11	2016/E	% Increase (2016/2015)
Production	3,427	3.262	3.558	3,8	10,441	10.919	11.911	2,5
Imports	426	395	430	1,1	1,426	1.614	1.760	2,4
Exports	811	792	864	6,6	2,225	2.065	2.252	1,2
Domestic Consumption	3,042	2.864	3.124	2,7	9,642	10.468	11.419	2,7
Foreign Trade Deficit / Surplus	385	398	434	12,7	799	451	492	-2,6
Exports / Production (%)	24	24	24		21	19	19	
İImports / Domestic Consumption (%)	14	14	14		15	15	15	
Exports / Imports (%)	190	201	201		156	128	128	

Table 14: Supply and Demand Equilibrium in Plastics Packaginng Meterials Industry

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5. CONCLUSION

Turkey, shows a faster development than the EU Countries the economies of which are more developed and relatively sophisticated packaging markets have reached saturation pints.

Growing urbanization trend, the lengthening of the average life expectancy, women's increasing population of working life, the contribution of consumption habits and the expectations of consumers; developed the self-service in the central and consumer direct selling hypermarket, promotes the spread of supermarkets and supermarket chains in the entire country.

This support the development of use of retail systems packaging. Likewise, consumers in markets achieve the possibility of finding with many more varieties of cheap but good quality and reliable products, price and quality.

Apart from customer service, sale promotions, special discounts, free product coupons directs customers preferably to purchase from the store.

To sum up; the chain of shopping malls and retail sales racks and feed the order accordingly packaged product demand. [1]

The raw materials and machinery and raw materials suppliers enter into closer global cooperation in the plastic packaging industry. Plastics packaging industry In the coming years;

- ✓ increased globalization in the world plastic packaging industry will result for especially small and medium-sized plastic processors in particular, the merger of the companies and even go to more and more cooperation.
- ✓ It will also create opportunities for the companies that develope new products and manufacture them will offer more added value.
- ✓ The plastics packaging industry comes increasingly into a service industry with international services, timely delivery and e-commerce. Outsourcing for customers and full service packages is being more important in the plastics packaging industry.

In 2023, in order to achieve the export target of $ 5.5 billion; the creation of strategic alliances should be discussed as another strategy. To this end; Exporting or less exporting companies to be gathered, establishment of plastic packaging industrial foreign trade company, to cut costs with joint purchasing and secure raw materials and additives to ensure supply, creating partner portals, establishing technical and commercial infrastructure, develop and expand the cluster activities to ensure increased efficiency in production and create a synergy actions in major plastic specialized organized industrial

[1] **Source: ASD**

zones.

Export of plastic packaging products in 2023 is expected to reach USD billion of 5.5. In order to achieve this goal; target markets and of products to be exported to these market (traditional and larger value-added) must be identified, conducting market researches for these products, the presantations of the selected product in the target markest, making B2B meetings, delegation visits and active participation in fairs to be obtained as the main actions.

Another strategy is to become a global center of excellence in producing innovative products in Turkey. The main actions that can be done for this purpose are;

To produce technological products, to set priorities on R&D investments, create development policies, take best practices of the leading Countries and organizations in the packaging industry as a model, develop mechanisms to encourage mergers to increase the international competitiveness, to identify the R&D needs of the plastic packaging industry to establish scientific works in universities to increase innovative activities.

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

5.1. PAGEV PLASTICS CENTER OF EXCELLENCE

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

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

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

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

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

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

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

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

Upon completion of the Center of Excellence, which will have an area of over 30 thousand m^2, rises right beside PAGEV Vocational and Technical Anatolian High School in Küçükçekmece, Istanbul. PAGEV Plastic Center of Excellence, which will make Turkey the center of plastic production in the world, will carry out innovative projects.

In addition to this, the Center will create a control mechanism for the products exported abroad. The Center will also contribute to the preservation of the reliability and reputation of the plastic products produced in Turkey. On the other hand, the introduction of poor quality and non-standard goods into the country will be prevented by determining the technical suitability of the plastic products imported from abroad without any definite importation in the laboratories.

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

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

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

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5.2. INTERNATIONAL REGIONAL PLASTIC MANUFACTURING CENTER

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

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

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

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