# PAGEV 2016
# WORLD & TURKISH PLASTICS INDUSTRY REPORT

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# EXECUTIVE SUMMARY

Turkish plastics industry, amongst the EU member states, ranks 2nd following Germany and 6th throughout the world with a share of 2.7 %. On the other hand, the 20.3 billion dollar foreign trade volume share of the Turkish plastics industry within the world plastic foreign trade volume is at a level of 1.7%. While the Turkish plastics industry received a share of 1.6% within global plastic product export and 1% within import, it received a share of 4.3% within raw material import and 0.4% within export.

As against Turkey ranking 2nd, following Germany, amongst EU member states in 2014 with an 8 million 568 thousand tonnes of plastic product manufacture, she is far below the countries with a lesser manufacture capacity than herself, in export. The main reason for the aforementioned is due to the fact that Turkey's 3 $ / Kg unit export price of plastic product export is 32% lower than world average of 4.5 $ / Kg and that Turkey cannot sufficient added value in export. This situation demonstrates that the Turkish plastics export is concentrated on the manufacture and export of products which cannot provide sufficient added value.

According to PAGEV records, around 6,500 manufacturers, most of which are small and medium-sized companies, are operating In Turkish plastics industry. In recent years, the production and export shares of SME companies are increasing.

It is expected that, Turkish plastics industry, will add value of USD billion of 13 and employment of 250.000 to Turkish economy in 2015 with its production of 8,6 million tones and production value of USD billion of 32,9.

As of 2015, 325 companies have foreign capitals within the plastics industry, More than 60 % of these are European origin.

With parallel to the increase in exports and increasing the use of technology in the plastics industry, number of companies that compete in the global market is increasing. In 2015 total plastic exports (end products and raw materials) share approximately 3.6% of total country exports taking the 10th position within exporter industries. In contrast, the plastics industry ( raw materials and end products ) share 6% of total country imports taking the 2nd position within 10 importer industries, due to the high import dependency in raw materials although plastics end product industry give trade surplus.

In 2015, with comparison to 2014, regarding plastic products; production realized as  8,57 million tons and USD billion of 32,9 increasing by 3,2 % on unit basis, decreasing by 6,6 % on value basis, imports realized as 585 thousand tons and USD billion of 2,87 increasing  by % 1,6 on unit basis and decreasing by 6,9 % on value basis, exports realized as 1,58 million tons and USD billion of 4,34 by decreasing % 1,6 on unit and % 12,8 on value base, domestic consumption, including those used for indirect export, displayed as 7,58 million tons and USD billion of 31,4 increasing by % 4,1 on unit base and decreasing by % 5,7 on value base. Foreign trade surplus decreased to 991 thousand tons and USD billion of 1,47 decreasing by 3,4 % on unit and 22,5 % on value basis,

In the same year, 18 % on unit basis and 13 % on value basis of domestic production was exported, 8 % on unit basis and 9% on value basis of domestic consumption, including those used for indirect export, was met with imports and export-import coverage ratio, on the other hand, realised as 269 % on unit basis and 151 % on value basis.

The plastics industry made a machinery and equipment investment of around USD billion of 8,14 between 2003 – 2015 and 78 % of this investment was met by imported machines. It is observed that an annual average of 626 million dollars machinery and equipment investment has been made within the last 13 years. The average annual investment has been realized as USD million of 822 for the last 5 years

The 2023 export vision of the industry is to accrue at least 17 billion dollars of the 50 Billion dollar export target of the chemical industry. For such degree of export to be performed, in parallel with its growth, the industry must concentrate on manufacture and export of products with high added values, to increase its unit export prices to 4.5 $ / Kg, average of developed countries and make the best of the investment incentives apart from resolving the increasing number of problems.

# 1.ECONOMIC SITUATION
## 1.1. DEVELOPMENTS IN WORLD ECONOMY IN 2015 AND 2016 EXPECTATIONS

Economic recovery has been the key matter of debate throughout the world in 2015. However, the issues regarding Syria and Ukraine has shaken the confidence in establishing the world economic balances. Notwithstanding the certain level of economic recovery in the USA and England in 2015, the risks concerning economic growth in the EU has increased and Japan, on the other hand, has entered recession within the last quarter of the year. Negativities has been experienced in economic outlook of many developed countries such as China, Russia and Brazil. The economies of developing countries, due to the slowdown, have lost their driving force characteristic within the world economy.

Annual decline in oil prices in 2015 reached 34 %. On the one hand the low levels of global demand, continuing increase in the energy supply continues to keep oil prices under downward pressure.US Federal Reserve Bank (Fed) raised interest rates for the first time after 9 years on December 16, 2015. The decision to increase the policy rate by the Fed in 2016 is expected to improve in the US economic activity, to lower unemployment rate,

Indeed, since the beginning of 2015 with the expected rate hike decision concerns the reduction of uncertainty in the global markets for monetary policy was reflected positively in the markets generally.USA economy in the 3rd quarter of the year grew by 2 % on an annual bases. Despite losing momentum, growth rates compared to the second quarter, is observed a stable trend in the US economy.

In the euro area draws an overall positive macroeconomic data table. The specific problems of the developing economies, the risk perception towards these countries has led to a further deterioration in recent years.

As the political concerns are increasing in South Africa and Brazil, the negative developments between Turkey and Russia has led to the rise of geopolitical risks. These developments has put pressure on local currencies of these countries.

International credit rating agency Fitch, has reduced Brazil's credit rating below investment grade. The main reasons for the lowering of credit ratings; Being in a deeper than anticipated recession of the Brazilian economy, political uncertainty and not enough implementation of the measures needed to control the growing debt load.

Anxiety about the economy in China is ongoing. Declining commodity and inflation indicators remained low energy prices and the impact of weak demand indicate that economic activity continued to remain under pressure. Exports and imports in China is continuing to decline, which in turn confirms weak outlook in the economy. In 2016 China plans to support economic activity through monetary and fiscal policy. To this end, the government has decided to strengthen aggregate demand in 2016, production to make it more balanced, to reduce overcapacity in the industry, to reduce the real estate stocks, reduce financial risks and to take a series of measures to drive down the costs of the companies.

The most important development that will affect the direction of the world economy in 2016

- Recovery in the US economy ,
- Developments in the euro area,
- Decisions of the Fed's on the course monetary policy,
- Developments in the emerging economies,
- The ability of the exporters of the commodities to tolerate the negative
- effects caused by the rapid decline in commodity prices.

| Main Indicatorts | 2015 | 2016 (E) | Main Indicatorts | 2015 | 2016 (E) |
|---|---|---|---|---|---|
| Growth Rate | | | Current Balance / GDP | | |
| USA | 2,6 | 2,8 | USA | -2,6 | -2,9 |
| Euro Zone | 1,5 | 1,6 | Euro Zone | 3,2 | 3,0 |
| Japan | 0,6 | 1,0 | Japan | 3,0 | 3,0 |
| China | 6,8 | 6,3 | China | 3,1 | 2,8 |
| Turkey | 3,0 | 2,9 | Turkey | -4,5 | -4,7 |
| Inflation ( Year end ) | | | Unemployment | | |
| USA | 0,9 | 1,4 | USA | 5,3 | 4,9 |
| Euro Zone | 0,7 | 1,1 | Euro Zone | 11,0 | 10,5 |
| Japan | 0,1 | 0,6 | Japan | 3,9 | 3,8 |
| China | 1,8 | 1,8 | China | 4,1 | 4,1 |
| Turkey | 8,0 | 6,5 | Turkey | 10,8 | 11,2 |

Source: OECD

Table 1: Main Economic Indicators in World Economy

The continued decline in oil and gas prices continues to affect global system negatively by hands of many commodity -exporting countries.For China's economy, which declined growth rate of 6 % levels, concerns about not carry on in a healthy manner are continuing. If China enters into such a situation that Japan has entered years ago, the global system cannot go through a kind of recession that is known to be a very negative impact.

The amount of interest rate hikes in the US, China's recovery efforts, the expected recession in EU, the risks in Russia, Ukraine and Syria due to the decline in oil and commodity prices , it is difficult to expect positive developments in the world economy in 2016 .

As India's economy is expected to rise significantly in 2016, the Russian economy is expected to decline due to the sanctions caused by the Ukraine crisis, the depreciation of the ruble with the effect of falling oil prices and the decline the capital outflows.

Decline in oil prices, to stimulate domestic demand in both developed and developing countries and non-oil producing countries in the current account deficit to fall, will have a positive impact on the decline of inflation and interest rates. However, the expected decline in global money supply in 2016 will force the developing countries to make more structural reforms for growth.
The possible effects of the negative developments in the Chinese economy to the plastics industry in Turkey can be summarized as follows:

# 1.1. DEVELOPMENTS IN WORLD ECONOMY IN 2015 AND 2016 EXPECTATIONS

**Positive Effects:**

- Due to the impact of negative developments in China and falling oil prices are expected to contribute to the plastics industry, as a result of the decline of energy costs and raw material import prices. Turkish plastics industry will reach a more affordable and increase the competitive supply of plastic raw materials production and export facilities.
- In the last 10 years labor costs on dollar base in China has increased 3 times. The devaluation of Yuan, is lower than the devaluation in Turkey for the last years. For these reasons, it may not be very rapid developments of China's exports in a short term.

**Adverse Effects:**

- The contraction in the Chinese economy will lower the capacity utilization in the plastics and plastic processing machines industries will increase the efforts of companies to increase their exports. Therefore, China will reduce export prices of plastic products and plastic processing machinery with the effect of the devaluation of the currency. China will try to export to Turkey and Turkey's export markets with cheaper prices.
- Currently, as the main import partners, China’s share in Turkish domestic consumption will increase further.
- Turkish companies will have to make more control on their falling profit margins.

# 1.2. DEVELOPMENT IN TURKISH ECONOMY IN 2015 AND EXPECTATIONS FOR 2016

While the Turkish economy downsized in 2009 by 4.9 %, it reached to high growth rates such as 9.2% and 8.8 % in 2010 and 2011, however the growth rate decreased to 2.2 % in 2012, while it increased to 4.2 % in 2013, once again it regressed to 2.5 % in 2015.

In 2015, Turkey's economy grew by 3.8 percent. Increasing public spending ahead of the elections, the healthy growth of the agricultural sector and domestic demand have turned positive trend in exports and a worsening economy has recorded 4% growth in the 3rd quarter.

| | | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| GDP | (Billion $) | 774,0 | 766,3 | 823,0 | 789,0 | 730 ( T ) |
| Growth Rate | (%) | 8,8 | 2,1 | 4,2 | 2,0 | 3,2 ( T ) |
| Inflation (Consumer Price Index) | (%) | 10,5 | 6,2 | 7,4 | 8,1 | 8,8 |
| Producers Price Index | (%) | 13,3 | 2,5 | 7,0 | 6,4 | 5,7 |
| Unemployment | (%) | 8,5 | 8,9 | 9,1 | 10,4 | 10,5 ( 10 ) |
| Exports | (Billion $) | 134,4 | 152,5 | 151,8 | 157,6 | 143,9 |
| Imports | (Billion $) | 240,8 | 236,5 | 251,7 | 242,2 | 207,2 |
| Froeign Trade Deficit | (Billion $) | -106, | -84,0 | -99,9 | -84,6 | 63,3 |
| Exports / Imports | (%) | 55,8 | 64,5 | 60,3 | 65,1 | 69,5 |
| Current Balance | (Billion$) | -75,0 | -48,5 | -64,7 | -46,5 | 38,1 ( 10 ) |
| Current Balance /GDP | (%) | -9,7 | -6,2 | -7,4 | -5,8 | - |
| Budget Balance/GDP | (%) | -1,4 | -2,1 | -1,2 | -1,3 | - |
| Total Debt Stocs | (Billion $) | 518,4 | 532,2 | 585,8 | 614,1 | 676,2 |
| USD / TL | (TL) | 1,8934 | 1,7890 | 2,1323 | 2,3290 | 2,9277 |
| EURO / TL | (TL) | 2,4497 | 2,3508 | 2,9370 | 2,8297 | 3,1944 |

Source: Ministy Of Economy, Underecreataru of Treasury, Central Bank, Turk Statistics Department

Table 2: Main Economic Indicators

In 2015, exports realized as 143.9 billion dollars decreasing by 8.7 % compared to the previous year. The decrease in exports to the Nearest and Middle East countries and EUR / USD ratio has played an important role in the declining of expert. During this period, imports narrowing 14.4% realized as 207.2 billion dollars. In these developments, moderate growth in domestic demand has played an important role alongside the decline in energy prices. In 2015 the foreign trade deficit was 63.3 billion USD which is 21.3 billion dollars less than 2014.

As the share of exports to the euro area countries in 2015 exhibited an horizontal view by 29.8 %, the share of the Near and Middle East countries decreased to 21.6 % A significant decrease of Russia's and Iraq’s shares in our total exports have been attracted attention .

# 1.2. DEVELOPMENT IN TURKISH ECONOMY IN 2015 AND EXPECTATIONS FOR 2016

IMF forecasts for Turkey shows that it would continue the economic difficulties in 2016. If the growth forecast of 2.9% which will be held Turkey lived under the thick fifth year of potential growth. Turkey to remain below potential growth of such a long period of time, it would mean losing an important part of the recovery after the 2001 crisis. This growth rate will shift Turkey more to the middle income trap.

One of the many issues that concern Turkey's economy in 2016, as the second half of 2015, the Fed's attitude on interest rate hike. Because, the economies heavily dependent on external funding sources such as Turkey, will be negative affected by the increasing interest rates.

Growth expectations in the medium-term program recently announced by the Government for 2016 and 2017 drawn down by OECD and OECD also advised Turkey ambitious structural reforms on inflation.

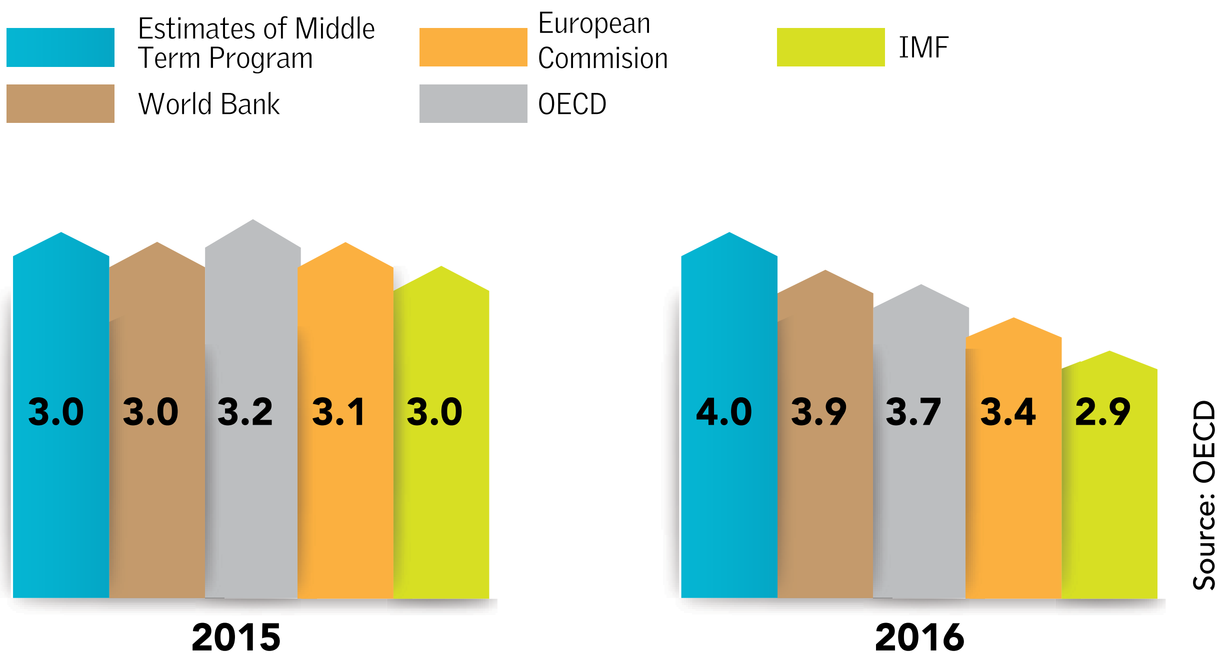



Figure 1: GDP Growth Rate Estimates for Turkey (%)

OECD announced that the depreciation in TL increased Turkey's competitive power but undermine the confidence of households, increased the pressure on the balance and increased the inflation rate. OECD emphasizes the need to continue to tighten monetary policy to keep inflation under control OECD, in case of persistent inflation remains above target as it is mentioned that it may be further tightening of monetary policy. According to the Government's Medium Term Programme estimated consumer prices 7.5 %, 6,5 % and 5,5 % for three years, OECD estimated consumer prices as 7,4, 6,9 % and 6,5 % for the same period.

## 1.2. DEVELOPMENT IN TURKISH ECONOMY IN 2015 AND EXPECTATIONS FOR 2016

While the Turkish economy downsized in 2009 by 4.9 %, it reached to high growth rates such as 9.2% and 8.8 % in 2010 and 2011, however the growth rate decreased to 2.2 % in 2012, while it increased to 4.2 % in 2013, once again it regressed to 2.5 % in 2015.

In 2015, Turkey's economy grew by 3.8 percent. Increasing public spending ahead of the elections, the healthy growth of the agricultural sector and domestic demand have turned positive trend in exports and a worsening economy has recorded 4% growth in the 3rd quarter.

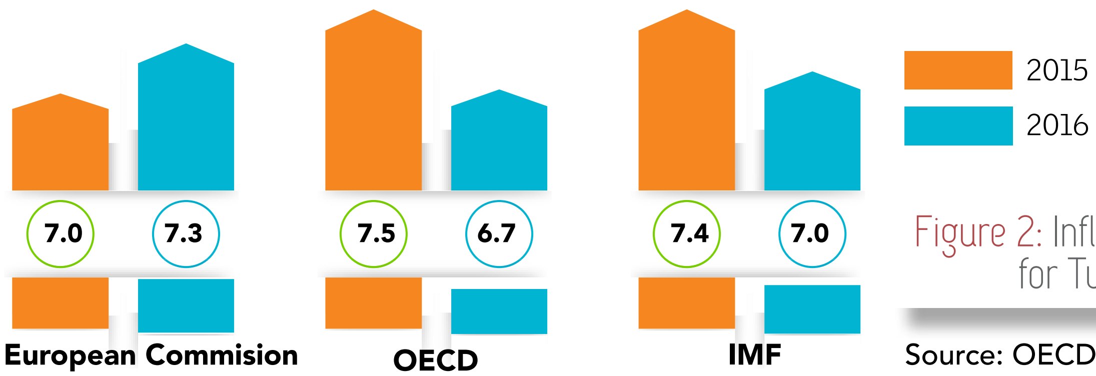



Figure 2: Inflation Estimates for Turkey (%)

Source: OECD

The OECD forecasts the unemployment rate as 10.5 % for 2015, 10,8 % for 2016 and % 10,3 for 2017

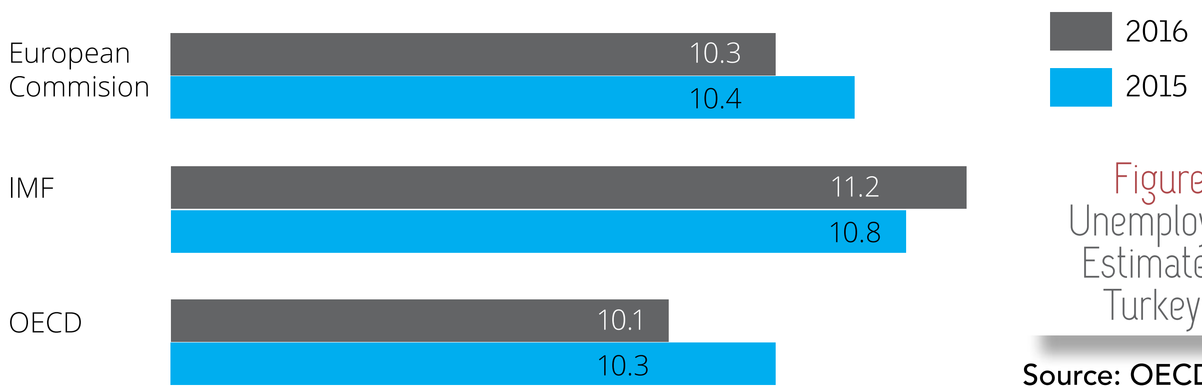



Figure 3: Unemployment Estimates for Turkey (%)

Source: OECD

The most significant factors, which will affect the development of Turkish economy in 2015 are forecasted to be originated from the increase in domestic demand rather than foreign demand and the increase in domestic demand, on the other hand, to be dependent on public expenditures and the increase in export on the recovery of the EU economy, the growth in Chinese economy and decline in prices. Apart from the aforementioned, the decline occurred in oil and energy prices is expected to have a positive effect on inflation and the 2016 year end inflation to draw close to Medium Term Program targets.

Despite its regression, current deficit remains to be one of the foremost issues of the Turkish economy and for to preserve the macro-financial stability, the current deficit must be held at controllable levels. The political and economic risks demonstrates that growth will occur at lower levels. Turkey ranks top amongst the economies with fragility risk in 2016. The root cause of this is considered to be high current deficit, decelerated growth rate and political tensions.

## 1.2. DEVELOPMENT IN TURKISH ECONOMY IN 2015 AND EXPECTATIONS FOR 2016

High current deficit, inflation increase, deceleration in growth rate, increasing financial need and hot money outflow are considered to be amongst the risks which the Turkish economy will face in 2016. The possible negative effects of all of these developments on the economy in 2016 can be summarised as follows;

- Decrease in economy and sector growth rates,
- Increase in unemployment rate,
- Decrease in manufacture capacities by businesses in order to particularly avoid from personnel expenditures, in order to close the deficits arising from exchange differences and to execute redundancies and refraining from creating new employment fields for the aforementioned,
- Imposing restrictions in manufacturing industry and foreign acquisitions in raw material,
- Acceleration of hot money outflow.
- The decline in foreign capital inflows due to the negative developments in Syria and Iraq ,
- Postponement of investment due to political uncertainty ,
- Decline in tourism revenues due to negative developments in Syria and Iraq and the economic crisis in Russia and Ukraine.
- The effects of increasing unemployment rate due to the 2 millions of immigrants from Syria

# 2. DEVELOPMENTS IN WORLD PLASTICS END PRODUCTS INDUSTRY
## 2.1. WORLD TOTAL PLASTICS END PRODUCTS PRODUCTION

Plastics production has a rapid development all over the world for 50 years due to high efficiency, low cost of production and recycling and the richness in design and implementation. Plastics is recognized as a global success story. Plastics production, which was 1,5 million tons in 1950, is estimated to be 324 million tons in 2015 with a cumulative annual growth rate of 4,1 % between 2010 – 2015.

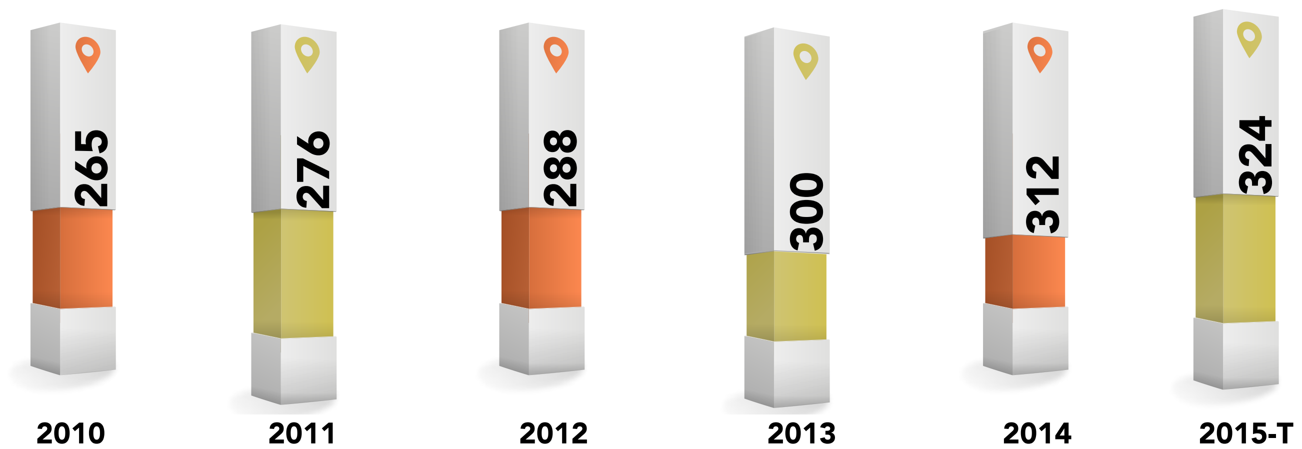



Figure 4: World Total Production of Plastics End Products - Million Tones

25 % of total production, which is estimated as 324 million tons in 2015 is realized by China, 21 % by Europe, 20 % by NAFTA and 16 % by Asian countries other than China. Middle East and African countries share 8 % and Latin America 7 % of total production.

| | %Share | Million T. |
|---|---|---|
| China | 25 | 81 |
| Europe | 21 | 68 |
| Nafta | 20 | 65 |
| Oth. Asia(Excl. China) | 16 | 52 |
| Middle East + Africa | 8 | 26 |
| Latin America | 7 | 23 |
| Others | 3 | 10 |
| **Total** | **100** | **324** |

Table 3: Regional Distribution of World Total Plastics End Products Manufacturing (2015)

# 2.1. WORLD TOTAL PLASTICS END PRODUCTS PRODUCTION

Approximately 25 % of the world's total plastic production is realized by China and 53 % it is carried out by 5 countries including China, USA, Germany, Saudi Arabia and India.
Turkey, producing 8.6 million tonnes of production and taking 2,7 % share of the global production in 2015 ranks 6thin the world and 2ndlargest plastic production after Germany in EU.

| | %Share | Million T. |
|---|---|---|
| China | 81,0 | 25,0 |
| USA | 47,3 | 14,6 |
| Germany | 16,8 | 5,2 |
| India | 13 | 4,0 |
| Tayland | 9,7 | 3,0 |
| Turkey | 8,6 | 2,7 |
| Italy | 8,4 | 2,6 |
| Brazil | 7,8 | 2,4 |
| France | 7,5 | 2,3 |
| Poland | 7,1 | 2,2 |
| Russian Fed. | 7,1 | 2,2 |
| Indonessia | 4,9 | 1,5 |
| Canada | 4,9 | 1,5 |
| Malaysia | 3,9 | 1,2 |
| Others | 96 | 29,6 |
| **Total** | **324** | **100,0** |

Table 4: Plastics End Products Manufacturing of Main Countries

## 2.2. WORLD TOTAL FOREIGN TRADE VOLUME OF PLASTICS ( END PRODUCTS AND RAW MATERIALS )

The world's total foreign trade volume of plastic between the years 2010 - 2014 increased at a 6 % compound growth rate ( CAGR) on quantity and value bases and realized as 514 million tons and 1,22 billion dollars in 2014. In 2015 the total trade volume is estimated to reach 551 million tons and 1.29 billion dollars.

Source: ITC, International Trade Center

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million T. | 407 | 411 | 405 | 510 | 514 | 6,0 | 551 |
| Billion Dolar | 966 | 1.128 | 1.111 | 1.178 | 1.219 | 6,0 | 1.292 |

Table 5: World Total Plastics Foreign Trade Volume

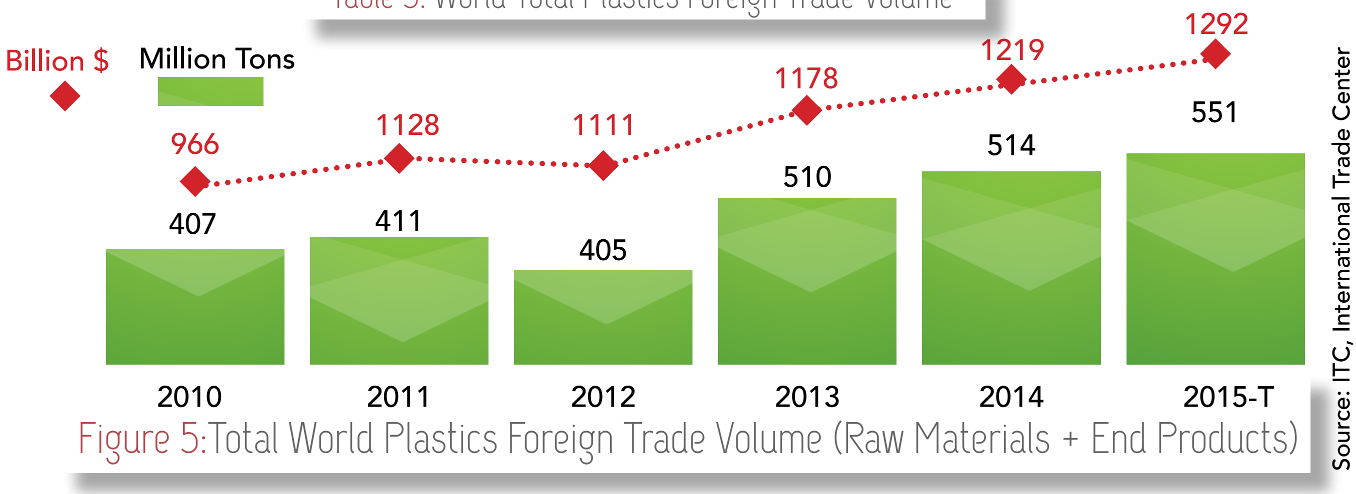



Figure 5:Total World Plastics Foreign Trade Volume (Raw Materials + End Products)

### 2.3. WORLD TOTAL FOREIGN TRADE VOLUME OF PLASTICS END PRODUCTS

The world's total foreign trade volume of plastic end products between 2010 - 2014 increased by compound average growth rate (CAGR) of 16 % on quantity base and 7 % on value base. Total trade volume of world plastic end products is estimated to reach to 208 million tons and 624 billion dollars in 2015.

Source: ITC, International Trade Center

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million T. | 101 | 97 | 88 | 181 | 179 | 15,5 | 208 |
| Billion Dolar | 454 | 524 | 528 | 562 | 585 | 6,6 | 624 |

Table 6: World Total Plastics End Products Foreign Trade Volume

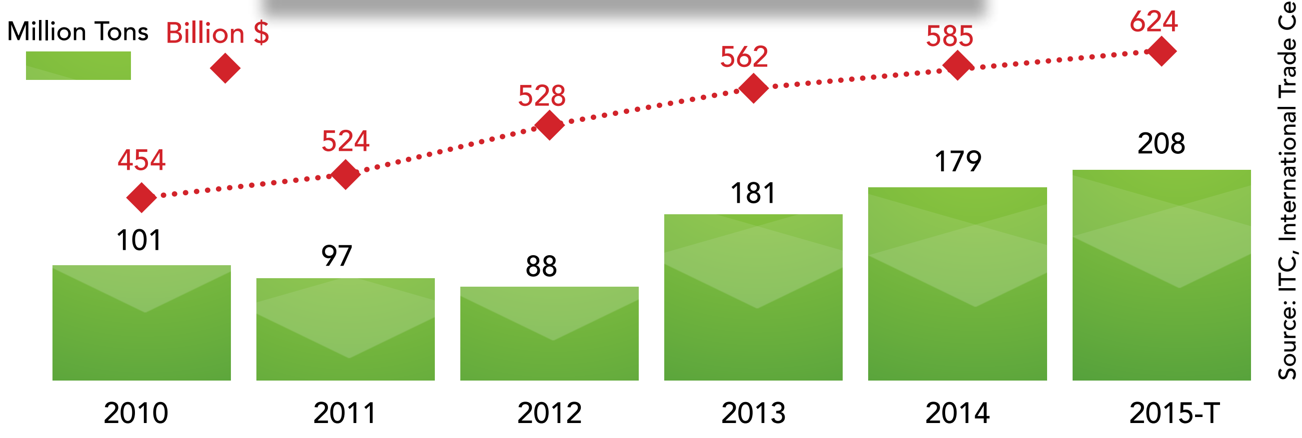



Figure 6: World Total Plastics End Products Foreign Trade Volume

## 2.4. TOTAL WORLD PLASTICS END PRODUCTS IMPORTS

Total world plastics end product imports, which was 57 million tons and 229 billion dollars in 2010, grew at compound growth rate ( CAGR) of 20 % in terms of quantity and 7 % in terms of value and reached to 117 million tons and 289 billion dollars in 2014. Total world imports of plastic end products is estimated to reach to 140 million tons and 306 billion dollars in 2015

Source: ITC, International Trade Center

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million T. | 57 | 52 | 60 | 117 | 117 | 19,9 | 140 |
| Billion Dolar | 229 | 262 | 261 | 278 | 289 | 6,6 | 306 |

Table 7: World Total Plastics End Products Imports

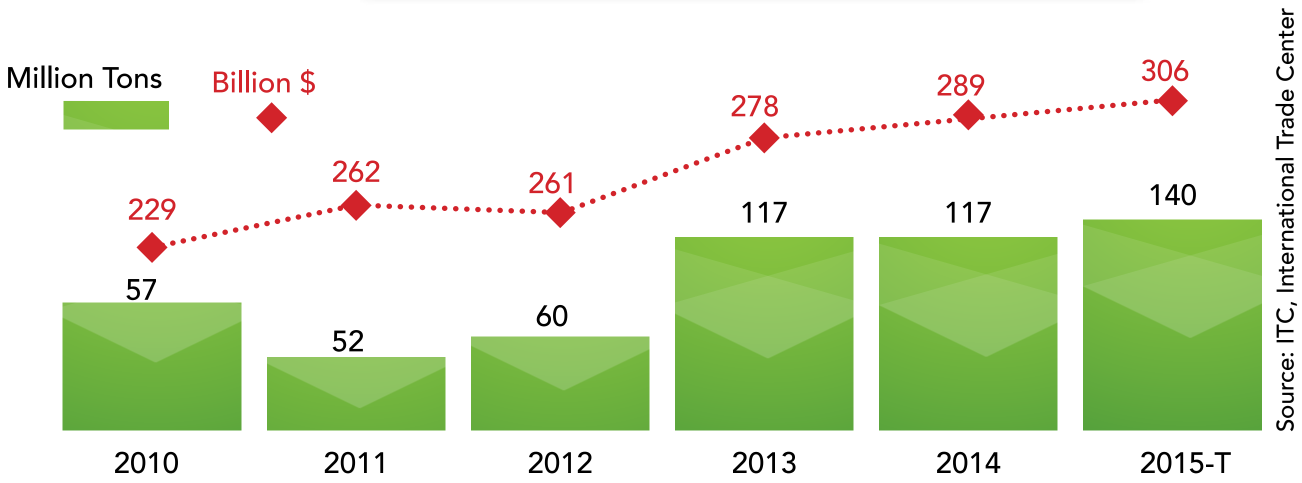



Figure 7: Total World Plastics End Products Imports

# 2.5. WORLD TOTAL PLASTICS END PRODUCT IMPORTS BY MAIN HS CODES

In 2014, 392690 HS product shared by 18.9 % of total world imports of plastic end products while 392010 HS Code 5.2 %, 392190 and 391990 HS Codes by 5 % and 302321 HS Codes 3,9 % on value base.

Source: ITC, International Trade Center

| HS CODES | HS CODES Description | Billion$ | %Share |
|---|---|---|---|
| 392690 | Goods made of plastic sheets (3916- 3924 external olds ) | 54,7 | 18,9 |
| 392010 | Plastic film etc; polyethylene | 15,1 | 5,2 |
| 392190 | Oth. joining pl. of polym.n products ,sheets,film,etc. (non-porous) | 14,5 | 5,0 |
| 391990 | The adhesive sheet, plate , strip , strip, film , foil ; the Otherside | 14,3 | 5,0 |
| 392321 | All liquids ichi bags ( including cones) ; polymers of ethylene | 11,1 | 3,9 |
| 392310 | Plastic boxes , crates , boxes and so on. goods | 10,7 | 3,7 |
| 392020 | Other plastic plates , sheets , film , etc ; polymers of ethylene | 10,4 | 3,6 |
| 392410 | Tableware and kitchenware of plastics | 9,9 | 3,4 |
| 392330 | Carboys, bottles , flasks etc | 8,7 | 3,0 |
| 392062 | PET films | 8,5 | 2,9 |
| | Others | 131,1 | 45,3 |
| | **Total** | **289,0** | **100,0** |

Table 6: Main 10 Products in Total World Plastics End Product Imports

# 2.6. TOTAL WORLD PLASTICS END PRODUCT IMPORTS BY COUNTRIES:

10 countries driving world imports of plastic end products shared 55 % of total imports on quantity base and 50 % on value base in 2014. On quantity base, 9 % of the total imports realized by USA, 8 % by Mexico, 6 % by Germany, 5 % by France and 4 % UK and Netherlands.

On the other hand, on value base, 11 % of total imports realized by USA, 7 % by Germany 6 % by China 5 % by France and Mexico. Turkey shares only 1 % of the world's total plastics end products imports on quantity and value bases.

| | Billion $ | | %Share-Billion $ | | | Million T. | | %Share-Million T. | |
|---|---|---|---|---|---|---|---|---|---|
| | **2010** | **2014** | **2010** | **2014** | | **2010** | **2014** | **2010** | **2014** |
| USA | 24,0 | 32,2 | 10,5 | 11,1 | USA | 4,7 | 5,7 | 6,7 | 9,1 |
| Germany | 16,1 | 20,8 | 7,0 | 7,2 | Mexico | 19,9 | 4,9 | 28,4 | 7,7 |
| China | 15,0 | 17,6 | 6,6 | 6,1 | Germany | 3,2 | 3,9 | 4,6 | 6,1 |
| France | 12,8 | 14,7 | 5,6 | 5,1 | France | 3,1 | 3,1 | 4,4 | 4,9 |
| Mexico | 10,5 | 12,8 | 4,6 | 4,4 | UK | 2,8 | 2,8 | 4,0 | 4,4 |
| UK | 9,7 | 11,8 | 4,2 | 4,1 | Netherlands | 2,2 | 2,5 | 3,1 | 3,9 |
| Canada | 7,5 | 9,2 | 3,3 | 3,2 | Japan | 1,7 | 2,0 | 2,4 | 3,1 |
| Japan | 7,6 | 9,2 | 3,3 | 3,2 | Canada | 1,5 | 1,7 | 2,2 | 2,7 |
| Netherlands | 5,4 | 7,8 | 2,4 | 2,7 | Spain | 1,6 | 1,7 | 2,3 | 2,7 |
| Belgium | 6,4 | 7,7 | 2,8 | 2,7 | China | 1,7 | 1,7 | 2,4 | 2,7 |
| Turkey | 2,1 | 3,1 | 0,9 | 1,1 | Turkey | 0,4 | 0,6 | 0,6 | 0,9 |

Table 7: World Total Plastics End Products Imports By Countries

Source: ITC, International Trade Center

# 2.7. TOTAL WORLD PLASTICS END PRODUCTS EXPORTS:

The world total exports of plastic end products, which was 44 million tons and 225 billion dollars in 2010, has increased at an average of 9 % in terms of quantity and 7.1 % in terms of value. Total exports is estimated to reach to 68 million tons and 317 billion dollars in 2015

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million T. | 144 | 46 | 28 | 64 | 62 | 9,0 | 68 |
| Billion Dolar | 225 | 262 | 267 | 285 | 296 | 7,1 | 317 |

Table 7: World Total Plastics Raw Materials Exports

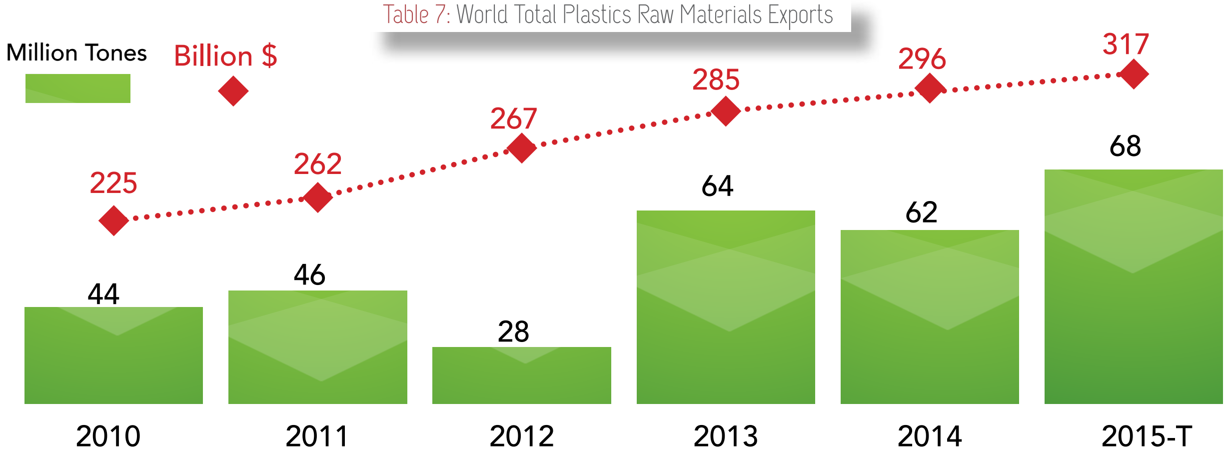



Figure 8: World Total Plastics Raw Materials Exports

## 2.8. TOTAL WORLD PLASTICS END PRODUCTS EXPORTS BY PRODUCTS

In 2014, 392 690 HS Codes shared 19 % of the world total exports of plastic products while 392 110, 391 990 and 392 190 shared by 5 % to.

| HS CODES | HS CODES Description | Billion$ | %Share |
|---|---|---|---|
| 392690 | Goods made of plastic sheets (3916- 3924 external olds ) | 55 | 19 |
| 392010 | Plastic film etc; polyethylene | 16 | 5 |
| 391990 | The adhesive sheet, plate , strip , strip, film , foil ; the otherside | 15 | 5 |
| 392190 | Other joining plates of polymerization products , sheets, film, etc. ( non-porous ) | 15 | 5 |
| 392310 | Plastic boxes , crates , boxes and so on. goods | 12 | 4 |
| 392321 | All liquids ichi bags ( including cones) ; polymers of ethylene | 11 | 4 |
| 392020 | Other plastic plates , sheets , film , etc ; polymers of ethylene | 11 | 4 |
| 392410 | Tableware and kitchenware of plastics | 10 | 3 |
| 392330 | Carboys, bottles , flasks etc | 9 | 3 |
| 392350 | Cover and capsules bottles ich | 8 | 3 |
| | Others | 134 | 45 |
| | **Total** | **296** | **100** |

Source: ITC, International Trade Center

Table 8: Total World Plastics End Products Exports By Main Products

## 2.2. TOTAL WORLD PLASTICS END PRODUCTS EXPORTS BY COUNTRIES

10 countries driving the world's exports of plastic end products received 61 % of exports on quantity and 63 % on value base in 2014. China takes the first place in total exports in terms of both quantity and value base in 2014. China's shares 18 % of total exports in quantity base and 22 % in value base.

| | Billion $ | | %Share - Billion$ | | | Million T. | | % Sha.-Million T. | |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2014 | 2010 | 2014 | | 2010 | 2014 | 2010 | 2014 |
| China | 27 | 52 | 12 | 18 | China | 13,4 | 13,9 | 24 | 22 |
| Germany | 30 | 37 | 13 | 12 | Germany | 5,3 | 5,7 | 9 | 9 |
| USA | 21 | 27 | 10 | 9 | USA | 3,7 | 4,2 | 7 | 7 |
| Italy | 12 | 14 | 5 | 5 | Italy | 2,7 | 2,8 | 5 | 4 |
| Japan | 16 | 13 | 7 | 4 | Mexico | 2,9 | 2,3 | 5 | 4 |
| France | 9 | 10 | 4 | 3 | Netherlands | 1,4 | 1,8 | 3 | 3 |
| S.Korea | 6 | 9 | 3 | 3 | Belgium | 1,7 | 1,7 | 3 | 3 |
| Belgium | 8 | 9 | 3 | 3 | Poland | 1,3 | 1,7 | 2 | 3 |
| Holanda | 6 | 8 | 3 | 3 | S.Korea | 1,4 | 1,7 | 2 | 3 |
| UK | 6 | 8 | 3 | 3 | Turkey | 1,1 | 1,6 | 2 | 3 |

Source: ITC, International Trade Center

Table 9: Total World Plastics End Products Exports By Countries

| | %Share |
|---|---|
| China | 22 |
| Germany | 9 |
| USA | 6 |
| Italy | 4 |
| Mexico | 4 |
| Netherlands | 3 |
| Belgium | 3 |
| Poland | 3 |
| S.Korea | 3 |
| Turkey | 2 |
| Diğer | 41 |
| **Total** | **100** |

Table 10: Share of Main Exporter Countries for Plastics End Products ( Ton - % )

| | %Share |
|---|---|
| China | 18 |
| Germany | 12 |
| USA | 9 |
| Italy | 5 |
| Japan | 4 |
| France | 3 |
| S.Korea | 3 |
| Belgium | 3 |
| Netherlands | 3 |
| UK | 3 |
| Diğer | 37 |
| **Total** | **100** |

Table 11: Share of Main Exporting Countries For Plastics End Products ( $ - % )

# 3. DEVELOPMENTS IN TURKISH PLASTICS INDUSTRY:
# 4. PLASTICS PRODUCT:
## 4.1. OPERATING COMPANIES:

According to the PAGEV records, it is known that about 6,500 companies are operating in Turkish plastics industry 99 % of which are SME's. Building materials shares of 23.1 % in the distribution of the companies by main products. The number of packaging materials manufacturers followed with 22 % while, household appliances , machinery, textile , electrical - electronics, automotive manufacturers and raw material firms shares between 5 – 10 % of total companies.

Source: PAGEV Data Bank

| Industry | No of Com. | %Share | Indust. | No of Com. | %Share |
|---|---|---|---|---|---|
| Construction | 1.500 | 23,1 | Medical | 112 | 1,7 |
| Packaging | 1.433 | 22,0 | Toys | 72 | 1,1 |
| Household appliances | 613 | 9,4 | Stationery | 57 | 0,9 |
| Machinery | 598 | 9,2 | Wh. Goods | 56 | 0,9 |
| Textile | 427 | 6,6 | Agriculture | 43 | 0,7 |
| Electric - Electronics | 399 | 6,1 | Furniture | 16 | 0,2 |
| Automotive | 348 | 5,4 | Defence | 3 | 0,0 |
| Raw Materials | 334 | 5,1 | Others | 164 | 2,5 |
| Rubber | 203 | 3,1 | **Total** | **6.499** | **100,0** |
| Shoes-Sport | 121 | 1,9 | | | |

Table 12: Companies by Sub Sectors

91,3 % of total companies operate in 12 provinces. Other provinces share only 8,7 % of total manufacturers. About 62,1 % of total companies operate in Istanbul while Bursa and İzmir more than 5 % .Ankara, Gaziantep, Konya and Kocaeli are provinces sharing about 3 – 4 % of total companies and the shares of Adana, Kayseri, Samsun, Mersin and Denizli changes between 1 – 1,5 %.

| Provinces | No of Com. | %Share |
|---|---|---|
| ISTANBUL | 4.039 | 62,1 |
| BURSA | 342 | 5,3 |
| IZMIR | 342 | 5,3 |
| ANKARA | 258 | 4,0 |
| GAZIANTEP | 242 | 3,7 |
| ADANA | 99 | 1,5 |
| KAYSERI | 72 | 1,1 |
| KONYA | 181 | 2,8 |
| KOCAELI | 176 | 2,7 |
| SAMSUN | 64 | 1,0 |
| MERSİN | 62 | 1,0 |
| DENIZLI | 58 | 0,9 |
| Total 12 Provinces | 5.935 | 91,3 |
| Other Provinces ( 57 ) | 564 | 8,7 |
| **Total** | **6.499** | **100,0** |

Table 13: Manufacturing Companies by Provinces

## 4.2. PLASTICS PRODUCT MANUFACTURING:

Plastics product manufacture, which was 8,3 million tonnes and USD billion 35,2 in 2014, realised as 8,6 million tons increasing by 3,2 % on unit base and USD billion of 32,8 decrasing by 7 % on value base in

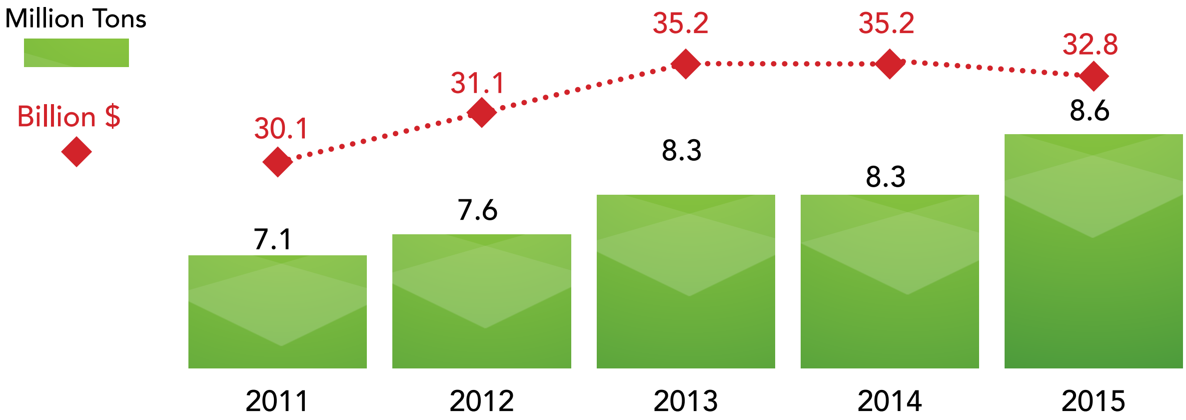



Figure 9: Plastics End Products Manufacturing

The growth of plastics industry, which doubled the GDP growth rate between 2002 – 2012 period, dropped below the GDP growth rate in 2014. In 2015, the growth rate of plastics industry realised as 3,2 % which is almost the same level with the growth rate of GDP which is estimated to be 3 %

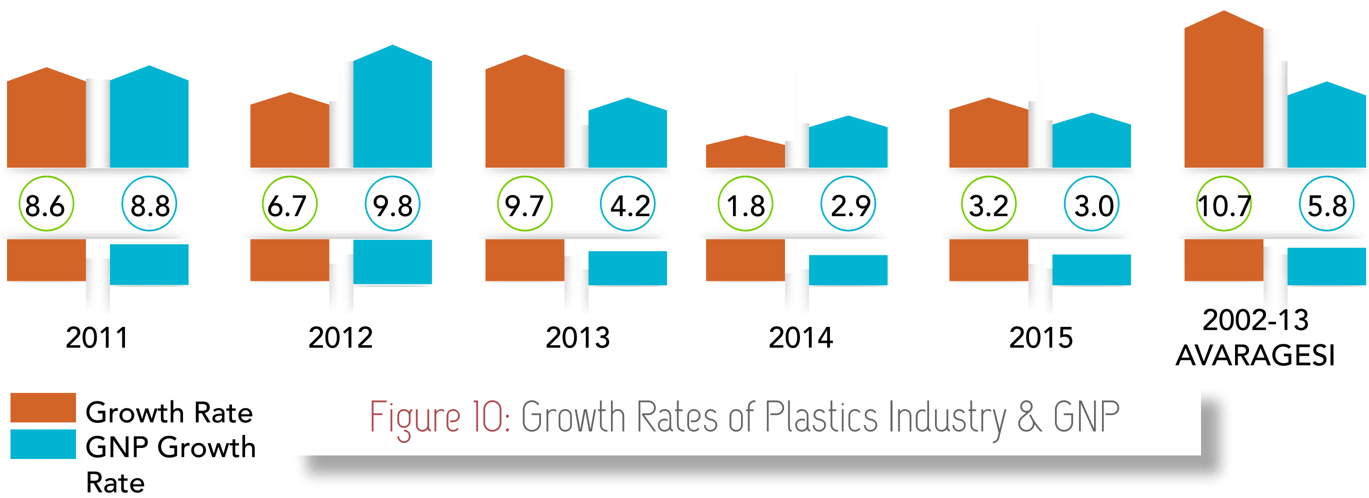



Figure 10: Growth Rates of Plastics Industry & GNP

## 4.3. PLASTICS PRODUCT PRODUCTION BY SUB SECTORS:

It is observed that plastic packaging materials led the way with 3,4 million tonnes and plastic construction materials following packaging with 1,9 million tonnes within total plastic product manufacture of 8,6 million tonnes in 2015.

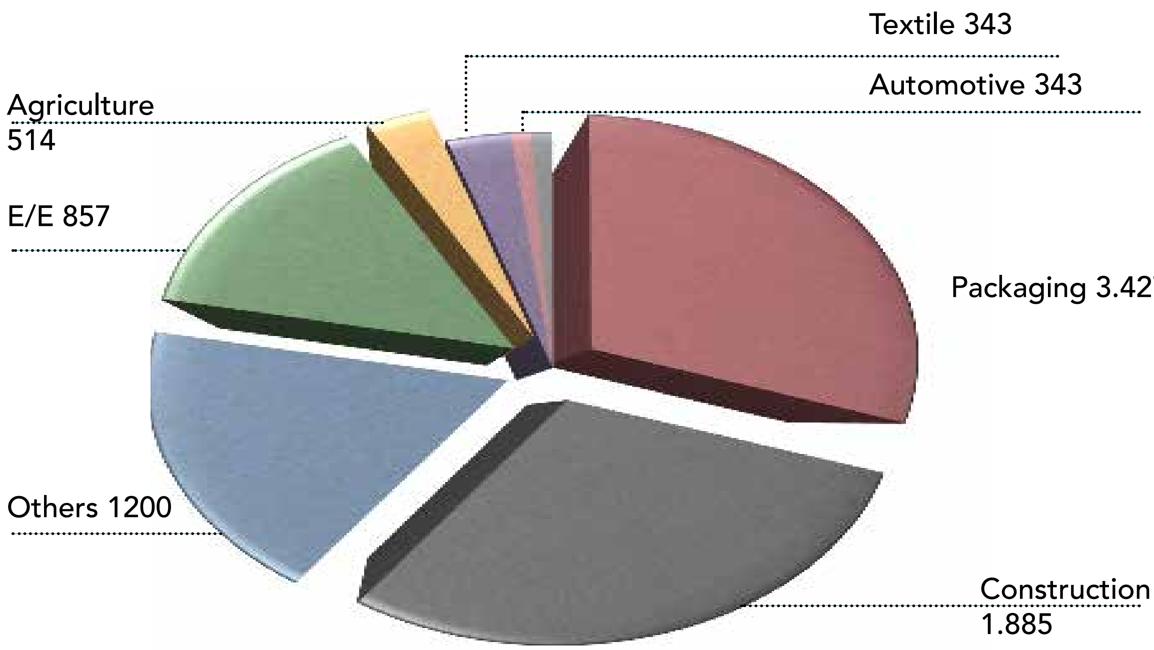



Figure 11: Production By Sub Sectors – 2015 ( 1000 Tons )

# 4.4. PLASTICS PRODUCT PRODUCTION BY PROVINCES:

The share of the 12 provinces in which intensive production of plastic products was made, realized as 7,5 million tons and 91 % of the total production of the plastics industry in 2015

| Province | 1000 TON |
|---|---|
| ISTANBUL | 5.312 |
| BURSA | 428 |
| IZMIR | 428 |
| ANKARA | 343 |
| GAZIANTEP | 343 |
| ADANA | 171 |
| KAYSERI | 86 |
| KONYA | 257 |
| KOCAELI | 257 |
| SAMSUN | 86 |
| MERSİN | 86 |
| DENIZLI | 86 |
| Total 12 Provinces | 7.883 |
| Other Provinces ( 57 ) | 685 |
| Total | 8.568 |

Table 14: Production Estimates by Provinces

## 4.5. CAPACITY UTILISATION RATE:

In 2015, capacity utilization rate of the industry realised as 73 %.This situation shows that there exists 27 % capacity surplus within the industry.

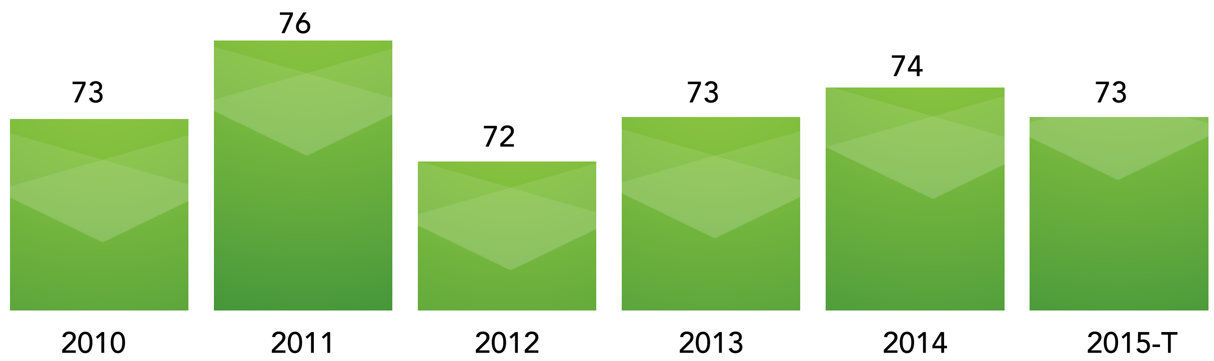



Figure 12: Capacity Utilization in Plastics Industry ( % )

Source: Turkish Statistics Department

# 4.6. FOREIGN CAPITAL IN PLASTICS INDUSTRY:

As of 2015, 325 companies have foreign capitals within the plastics industry, more than 60 % these are of European origin. 14 % of total foreign capital companies are comprised by Germany, 10 % by Syria and 8 % by Italy. The companies of France and Netherlands origin receive a share of 7 %,

| Countries | Number Of Companies | Countries | Number Of Companies |
|---|---|---|---|
| GERMANY | 45 | INDIA | 2 |
| SYRIA | 32 | JAPAN | 2 |
| ITALY | 29 | LEBANON | 2 |
| IRAN | 24 | UKRAINA | 2 |
| FRANCE | 23 | JORDAN | 2 |
| NETHERLANDS | 21 | BAHREYN | 1 |
| USA | 11 | BELARUS | 1 |
| AUSTRIA | 9 | GIBRALTAR | 1 |
| AZERBAIJAN | 9 | S.KOREA | 1 |
| BELGIUM | 9 | GEORGIA | 1 |
| UK | 9 | VIRGIN ISLANDS UK | 1 |
| SPAIN | 9 | CANADA | 1 |
| SWETZERLAND | 8 | KAZAKHIST. | 1 |
| BULGARIA | 7 | KENYA | 1 |
| IRAQ | 7 | KUVEYT | 1 |
| LUXEMBOURG | 6 | NORTHERN C. | 1 |
| EGYPT | 5 | LETONIA | 1 |
| RUSSIAN FED. | 5 | MONACO | 1 |
| GREECE | 5 | PORTUGAL | 1 |
| CHINA | 4 | S. ARABIA | 1 |
| DENMARK | 4 | CHILE | 1 |
| UZBEKİSTAN | 4 | TAJICHİSTAN | 1 |
| ISRAEL | 3 | TATARİSTAN | 1 |
| MAKEDONYA | 3 | TAIWAN | 1 |
| ALBANIA | 2 | TURKMENİSTAN | 1 |
| UAE | 2 | **Total** | **325** |

Source: Ministry of Economy

Table 15: Foreign Joint Ventures Companies by Origin Countries in Turkey

| | %Share |
|---|---|
| Germany | 14 |
| Syria | 10 |
| Italy | 9 |
| Iran | 7 |
| France | 7 |
| Netherlands | 7 |
| USA | 3 |
| Others | 43 |

Table 16: Foreign Joint Ventures Companies by Origin Countries in Turkey

# 4.7. MACHINERY AND EQUIPMENT INVESTMENT OF PLASTICS INDUSTRY

The plastics industry made a machinery and equipment investment of around USD billion of 8,14 between 2003 – 2015 and 78 % of this investment was met by imported machines. It is observed that an annual average of 626 million dollars machinery and equipment investment has been made within the last 13 years. The average annual investment has been realized as USD milion of 822 for the last 5 years

The total machinery and equipment investment of the industry realised as USD million of 839 in 2015 decreasing by 3 % compared to 2014.

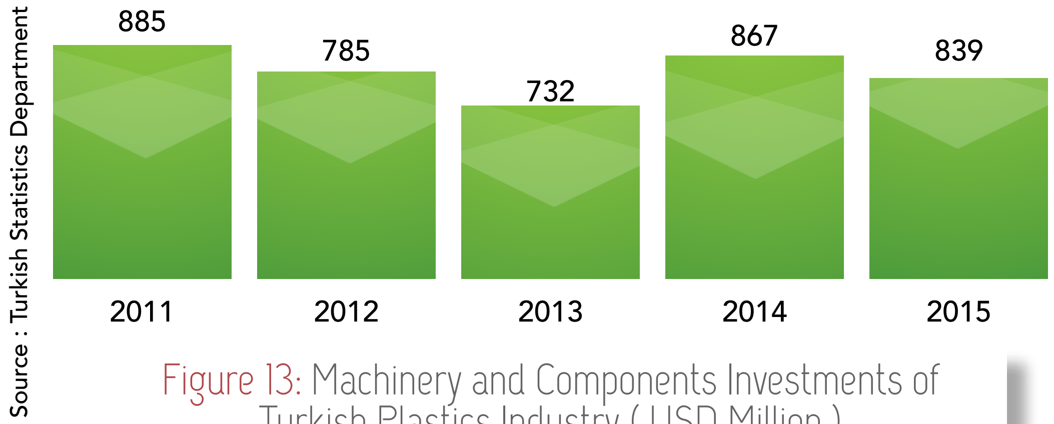



Figure 13: Machinery and Components Investments of Turkish Plastics Industry ( USD Million )

Of the 839 billion dollars of investment in 2015, 36 % was comprised of presses and other machineries, 24 % of injection machines, 17 % of extrusion machines and 18 % of components and parts.

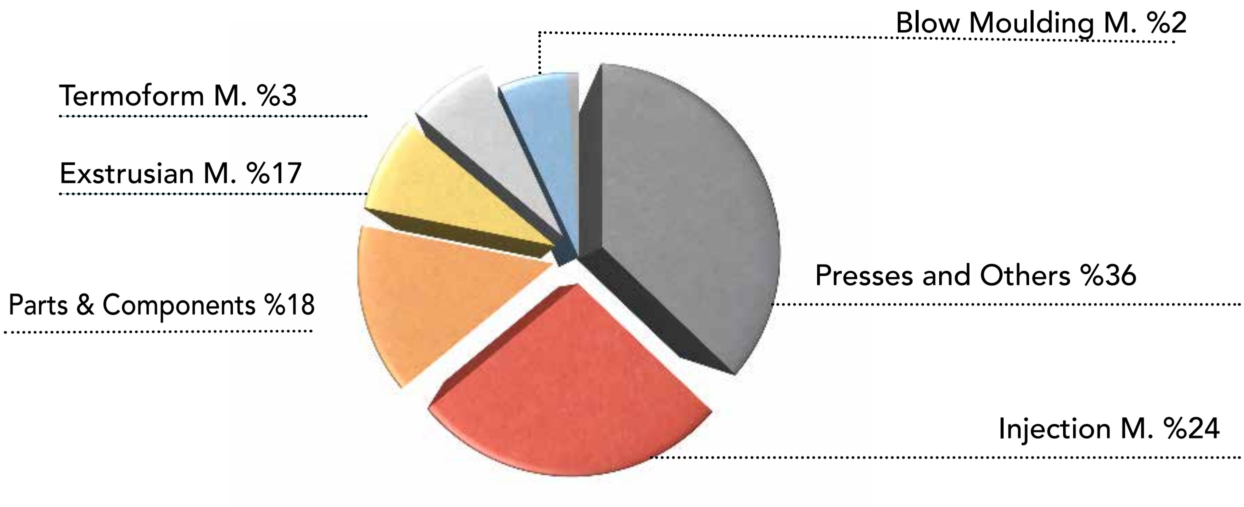



Figure 14: Machinery and Components Investmants of Turkish Plastics Industry By Types 2015

# 4.8. PLASTICS END PRODUCTS IMPORTS

Plastic product import constantly displayed an increase till 2015. Plastic product import realised as 585 thousand tons and USD billion of 2,61 in 2015, by increasing 1,6 % in unit base and declined by 6,9 % compared with 2014.

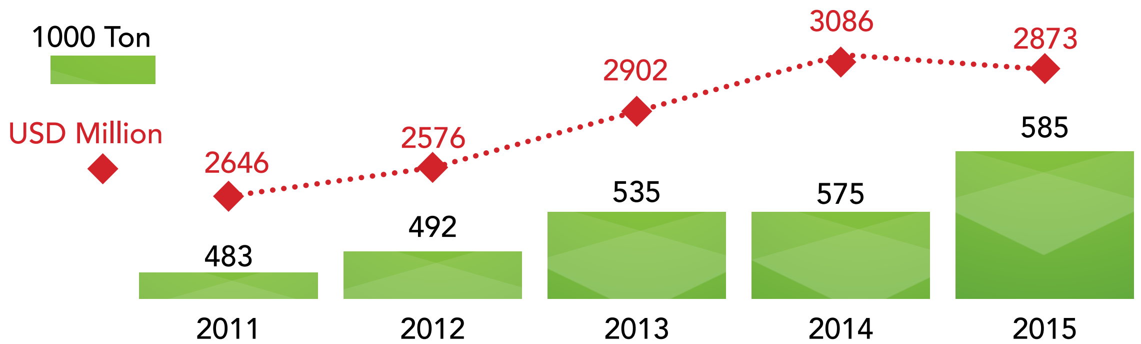



Figure 15: Plastics End Products Imports

In 2015, compared to 2014, biggest import was realized in 3920 Custom Duties Numbers on unit and value bases.

| HS CODES | HS CODES Description | 2014 | 2015 | %Increase |
|---|---|---|---|---|
| 3916 | MONOFILAMENT, BAR, PROFILES FROM PLASTIC-CROSS SECTION OVER 1MM | 9,9 | 12,3 | 23,8 |
| 3917 | TUBES, PIPES, HOSES FROM PLASTIC; GASKET, ELBOW, UNION ETC | 22,7 | 23,9 | 5,1 |
| 3918 | FLOOR COVERINGS FROM PLASTIC – INCL. WALL AND CEILING COVERINGS | 30,7 | 28,0 | -8,7 |
| 3919 | ADHESIVE PLATE, SHEET, STRIP, SLIDE, ETC. FROM PLASTIC; FLAT | 55,5 | 57,4 | 3,4 |
| 3920 | OTHER PLATE, SHEET, PELLICULE AND SLIDES FROM PLASTIC | 252,0 | 255,8 | 1,5 |
| 3921 | OTHER PLATES, SHEETS, PELLICULES, FOILS AND SLIDES FROM PLASTIC | 66,9 | 65,3 | -2,3 |
| 3922 | BATHTUB, SHOWER, SINK, BIDET, WATER-CLOSET PAN AND HARDWARE FROM PLASTIC | 3,2 | 4,9 | 52,4 |
| 3923 | PLASTIC PRODUCTS FOR MOVING FURNITURE, TAP, CAP, CAPSULE | 45,6 | 47,2 | 3,4 |
| 3924 | TABLE, KITCHEN AND OTHER HOUSEHOLD FURNITURE, TOILETRY FORM PLASTIC | 12,7 | 11,7 | -8,4 |
| 3925 | CONSTRUCTION MATERIALS FROM PLASTIC | 6,5 | 10,0 | 53,1 |
| 3926 | OTHER GOODS FROM PLASTIC | 69,5 | 68,1 | -1,9 |
| | **TOTAL IMPORTS** | **575,3** | **584,6** | **1,6** |

Table 17: Plastics Imports By HS Codes ( 1000 Ton )

| HS CODES | HS CODES Description | 2014 | 2015 | %Share |
|---|---|---|---|---|
| 3916 | MONOFILAMENT, BAR, PROFILES FROM PLASTIC-CROSS SECTION OVER 1MM | 52 | 52 | 1,0 |
| 3917 | TUBES, PIPES, HOSES FROM PLASTIC; GASKET, ELBOW, UNION ETC | 209 | 197 | -5,6 |
| 3918 | FLOOR COVERINGS FROM PLASTIC – INCL. WALL AND CEILING COVERINGS | 76 | 69 | -9,3 |
| 3919 | ADHESIVE PLATE, SHEET, STRIP, SLIDE, ETC. FROM PLASTIC; FLAT | 339 | 323 | -4,8 |
| 3920 | OTHER PLATE, SHEET, PELLICULE AND SLIDES FROM PLASTIC | 1.004 | 922 | -8,2 |
| 3921 | OTHER PLATES, SHEETS, PELLICULES, FOILS AND SLIDES FROM PLASTIC | 298 | 254 | -14,7 |
| 3922 | BATHTUB, SHOWER, SINK, BIDET, WATER-CLOSET PAN AND HARDWARE FROM PLASTIC | 28 | 49 | 71,6 |
| 3923 | PLASTIC PRODUCTS FOR MOVING FURNITURE, TAP, CAP, CAPSULE | 246 | 221 | -10,1 |
| 3924 | TABLE, KITCHEN AND OTHER HOUSEHOLD FURNITURE, TOILETRY FORM PLASTIC | 93 | 81 | -13,2 |
| 3925 | CONSTRUCTION MATERIALS FROM PLASTIC | 39 | 47 | 20,1 |
| 3926 | OTHER GOODS FROM PLASTIC | 703 | 658 | -6,4 |
| | **TOTAL IMPORTS** | **3.086** | **2.873** | **-6,9** |

Turkish Statistics Department

Table 18: Plastics Imports By HS Codes (USD Million)

# 4.9. PLASTIC PRODUCT IMPORTS BY COUNTRIES:

Turkey imports plastic product from over 100 countries every year. Import, made from 10 countries in 2014, comprised 70 % on amount basis and 76 % on value basis of the total import. In 2015 the share of top 10 countries, increased to 72 % in terms of amount and stayed by 76 % in terms of value.

it is observed that China has become prominent since 2014 in total plastics product imports. China shared 27 % of total imports on unit base and 22 % on value base while Germany, Italy and South Korea has preserved position in being the countries with which import is conducted the most.

| | 1000Ton | Billion$ | Ton - % | $ - % | Countries | 1000 Ton | Billion$ | Ton % | $- % |
|---|---|---|---|---|---|---|---|---|---|
| China | 161 | 666 | 28 | 22 | China | 158 | 633 | 27 | 22 |
| Germany | 88 | 591 | 15 | 19 | Germany | 94 | 538 | 16 | 19 |
| Italy | 43 | 253 | 7 | 8 | Italy | 47 | 235 | 8 | 8 |
| S. Korea | 35 | 212 | 6 | 7 | S.Korea | 33 | 188 | 6 | 7 |
| France | 24 | 177 | 4 | 6 | France | 26 | 165 | 4 | 6 |
| USA | 12 | 118 | 2 | 4 | USA | 11 | 123 | 2 | 4 |
| UK | 13 | 115 | 2 | 4 | UK | 13 | 102 | 2 | 4 |
| Belgium | 17 | 87 | 3 | 3 | Belgium | 18 | 80 | 3 | 3 |
| Spain | 9 | 61 | 2 | 2 | Spain | 11 | 58 | 2 | 2 |
| Japan | 3 | 50 | 0 | 2 | Holl. | 10 | 49 | 2 | 2 |
| 10 Countries | 404 | 2.330 | 70 | 76 | 10 Countries | 419 | 2.170 | 72 | 76 |
| Others | 171 | 756 | 30 | 24 | Others | 165 | 703 | 28 | 24 |
| Total | 575 | 3.086 | 100 | 100 | Total | 585 | 2.873 | 100 | 100 |

Source: Turkish Statistics Department

Table 19: Plastics End Products Imports by Countries

# 4.10.PLACE OF PLASTICS INDUSTRY IMPORTS IN TOTAL COUNTRY IMPORTS

The plastics industry (sum of products and raw materials) ranked 2nd largest importers industry with a share of 6 % amongst 10 importers industries in 2015. The reason for such ranking of the industry, which created surplus in plastic product foreign trade, amongst largest importer industries originates from its dependency on plastic raw material import.

| | | Billion $ | %Share |
|---|---|---|---|
| 1 | Motor vehicles and parts | 17,1 | 8 |
| 2 | Plastics and products | 12,3 | 6 |
| 3 | Iron and steel | 11,4 | 5 |
| 4 | Petroleum Products | 9,6 | 5 |
| 5 | Mineral fuels and oils | 9,3 | 4 |
| 6 | Electrical machines and devices | 8,6 | 4 |
| 7 | Telecommunication Materials | 7,6 | 4 |
| 8 | Power generating machines | 7,2 | 3 |
| 9 | Non ıron metals | 7,0 | 3 |
| 10 | Machines having specialties for some industries | 6,4 | 3 |
| | Other Industries | 112,1 | 54 |
| | **Total Imports** | **207,2** | **100** |

Source: Ministry of Economy

Table 20: Share of Plastics Industry Total Imports in Total Country Imports - 2015

# 4.11. PLASTIC PRODUCT EXPORT

Plastic product export comprises a large scale of Turkey's total plastic export both on amount and value basis. Plastic product export, which was 1.6 million tonnes and 4.9 billion dollars in 2014, ended with 1 million 577 thousand tons and 4,34 billion dollars with a decrease of 1,6 % on amount basis and 12,8 % on value basis in 2015.

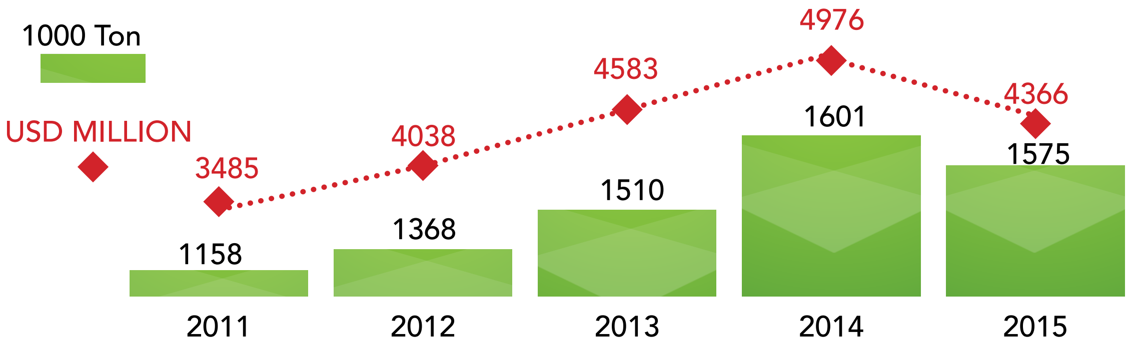



Figure 16: Plastics End Product Exports

HS Codes of 3917, 3920 and 3923 shared the biggest parts of total exports on unit base in 2015.

| HS CODES | HS CODES Description | 2014 | 2015 | Increase % |
|---|---|---|---|---|
| 3916 | MONOFILAMENT, BAR, PROFILES FROM PLASTIC-CROSS SECTION OVER 1MM | 195 | 156 | -19,9 |
| 3917 | TUBES, PIPES, HOSES FROM PLASTIC; GASKET, ELBOW, UNION ETC | 351 | 283 | -19,4 |
| 3918 | FLOOR COVERINGS FROM PLASTIC – INCL. WALL AND CEILING COVERINGS | 17 | 15 | -11,4 |
| 3919 | ADHESIVE PLATE, SHEET, STRIP, SLIDE, ETC. FROM PLASTIC; FLAT | 21 | 19 | -7,1 |
| 3920 | OTHER PLATE, SHEET, PELLICULE AND SLIDES FROM PLASTIC | 302 | 339 | 12,0 |
| 3921 | OTHER PLATES, SHEETS, PELLICULES, FOILS AND SLIDES FROM PLASTIC | 121 | 129 | 6,5 |
| 3922 | BATHTUB, SHOWER, SINK, BIDET, WATER-CLOSET PAN AND HARDWARE FROM PLASTIC | 26 | 24 | -5,4 |
| 3923 | PLASTIC PRODUCTS FOR MOVING FURNITURE, TAP, CAP, CAPSULE | 278 | 324 | 16,5 |
| 3924 | TABLE, KITCHEN AND OTHER HOUSEHOLD FURNITURE, TOILETRY FORM PLASTIC | 107 | 111 | 4,1 |
| 3925 | CONSTRUCTION MATERIALS FROM PLASTIC | 116 | 106 | -8,0 |
| 3926 | OTHER GOODS FROM PLASTIC | 68 | 69 | 0,5 |
| | **TOTAL EXPORTS** | **1.601** | **1.575** | **-1,6** |

Source: Turkish Statistics Department

Table 21: Total Plastics End Products Exports by HS CODES (1000 Ton)

| HS CODES | HS CODES Description | 2014 | 2015 | Increase % |
|---|---|---|---|---|
| 3916 | MONOFILAMENT, BAR, PROFILES FROM PLASTIC-CROSS SECTION OVER 1MM | 407 | 297 | -27,2 |
| 3917 | TUBES, PIPES, HOSES FROM PLASTIC; GASKET, ELBOW, UNION ETC | 925 | 718 | -22,4 |
| 3918 | FLOOR COVERINGS FROM PLASTIC – INCL. WALL AND CEILING COVERINGS | 38 | 30 | -23,0 |
| 3919 | ADHESIVE PLATE, SHEET, STRIP, SLIDE, ETC. FROM PLASTIC; FLAT | 148 | 115 | -22,3 |
| 3920 | OTHER PLATE, SHEET, PELLICULE AND SLIDES FROM PLASTIC | 968 | 915 | -5,5 |
| 3921 | OTHER PLATES, SHEETS, PELLICULES, FOILS AND SLIDES FROM PLASTIC | 420 | 386 | -8,2 |
| 3922 | BATHTUB, SHOWER, SINK, BIDET, WATER-CLOSET PAN AND HARDWARE FROM PLASTIC | 128 | 107 | -16,2 |
| 3923 | PLASTIC PRODUCTS FOR MOVING FURNITURE, TAP, CAP, CAPSULE | 816 | 809 | -0,9 |
| 3924 | TABLE, KITCHEN AND OTHER HOUSEHOLD FURNITURE, TOILETRY FORM PLASTIC | 396 | 346 | -12,6 |
| 3925 | CONSTRUCTION MATERIALS FROM PLASTIC | 326 | 264 | -18,9 |
| 3926 | OTHER GOODS FROM PLASTIC | 402 | 351 | -12,7 |
| | **TOTAL EXPORTS** | **4.976** | **4.338** | **-12,8** |

Source: Turkish Statistics Department

Table 22: Total Plastics End Products Exports By HS CODES (1000 $)

# 4.12. PLASTIC PRODUCT EXPORT BY COUNTRIES

Turkey exports plastic products to approximately 150 countries. While the 10 leading countries received as share of 49 % on amount and 47 % on value basis in 2014, these shares declined to 46 % and 45 % in 2015, respectively.
Iraq, Germany and UK comprise the leading 3 export markets to which plastic product is exported in 2015.

| | 2014 | | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1000Ton | Billion$ | Ton - % | $ - % | Countries | 1000 Ton | Billion$ | Ton % | $- % |
| Iraq | 242 | 545 | 15 | 11 | Iraq | 227 | 464 | 14 | 11 |
| Germany | 68 | 261 | 4 | 5 | Germany | 82 | 266 | 5 | 6 |
| Russian Fed. | 66 | 232 | 4 | 5 | UK | 75 | 218 | 5 | 5 |
| Azerbaijan | 69 | 231 | 5 | 5 | France | 51 | 172 | 3 | 4 |
| UK | 75 | 226 | 3 | 5 | Israel | 61 | 151 | 4 | 3 |
| Libya | 46 | 198 | 3 | 4 | Azerbaijan | 53 | 149 | 3 | 3 |
| France | 48 | 187 | 3 | 4 | Iran | 41 | 139 | 3 | 4 |
| Iran | 59 | 158 | 4 | | Romania | 52 | 134 | 3 | 3 |
| Romania | 50 | 155 | 3 | 3 | Italy | 44 | 126 | 2 | 2 |
| Georgia | 58 | 152 | 4 | 3 | Russian | 10 | 123 | 2 | 2 |
| 10 Countries | 781 | 2345 | 49 | 47 | 10 Countries | 724 | 1943 | 72 | 45 |
| Total | 575 | 4976 | 100 | 100 | Total | 1575 | 4338 | 100 | 100 |

Source: Turkish Statistics Department

Table 23: Turkey's Main Export Partners for Plastics End Products

## 4.13. SHARE OF PLASTIC EXPORT IN TOTAL NATIONAL EXPORT:

The plastics industry (product + raw materials) became the 10th largest exporter in 2015 with a share of 3,6 % within the total national export.

| | | Billion$ | %Share |
|---|---|---|---|
| 1 | Motor vehicles and their components, parts and accessories | 16,9 | 11,7 |
| 2 | Wearing | 15,1 | 10,5 |
| 3 | Textiles | 11,2 | 7,8 |
| 4 | Electrical Machineries | 8,5 | 5,9 |
| 5 | Iron and Steel | 7,9 | 5,5 |
| 6 | Fruits and Vegetabales | 7,7 | 5,3 |
| 7 | Jewelery | 7,4 | 5,1 |
| 8 | Others | 6,9 | 4,8 |
| 9 | Mineral Products | 5,7 | 4,0 |
| 10 | Plastics ( Raw Materials + End Products ) | 5,2 | 3,6 |
| | Others | 51,4 | 35,7 |
| | **Total Exports** | **143,9** | **100,0** |

Table 24: Share of Main Exporter Industries Within Total National Exports – (%)( 2015 )

# 4.14. PLASTIC PRODUCTS FOREIGN TRADE PRICES

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

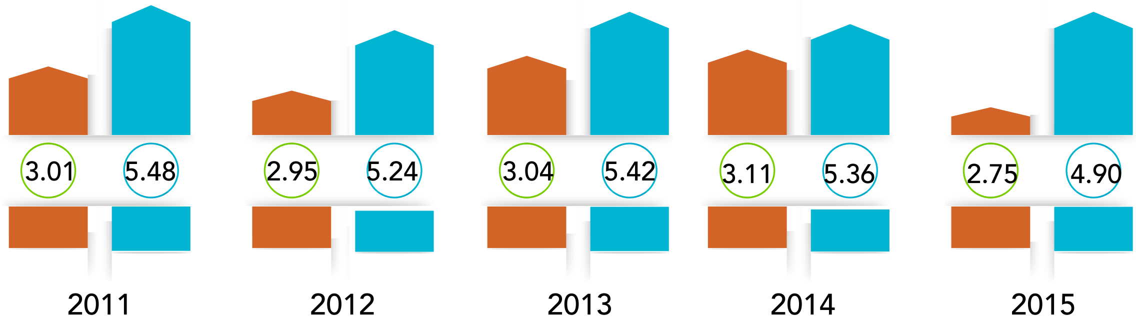



Figure 17: Avarage Foreign Trade Prices For Plastics End Products

In 2015, plastic product average import unit price decreased to 4,90 USD / kg in by decreasing 8,4 % when compared to 2014. On the other hand, average export unit price, decreased 2,75 USD / kg by 11,4 % decreasing when compared to 2014. The average export unit price was 44 % lower than average import unit price in 2015.

| | | Import Price | | | Import Price | |
|---|---|---|---|---|---|---|
| HS CODES | 2014 | 2015 | %increase | 2014 | 2015 | %increase |
| 3916 | 5,21 | 4,26 | -18,4 | 2,09 | 1,90 | -9,1 |
| 3917 | 9,18 | 8,25 | -10,2 | 2,63 | 2,54 | -3,7 |
| 3918 | 2,49 | 2,47 | -0,7 | 2,31 | 2,01 | -13,1 |
| 3919 | 6,11 | 5,62 | -7,9 | 7,11 | 5,95 | -16,4 |
| 3920 | 3,98 | 3,60 | -9,5 | 3,20 | 2,70 | -15,7 |
| 3921 | 4,45 | 3,88 | -12,6 | 3,48 | 3,00 | -13,8 |
| 3922 | 8,82 | 9,93 | 12,6 | 4,99 | 4,42 | -11,4 |
| 3923 | 5,39 | 4,69 | -13,0 | 2,93 | 2,50 | -14,9 |
| 3924 | 7,33 | 6,94 | -5,3 | 3,71 | 3,11 | -16,1 |
| 3925 | 5,95 | 4,67 | -21,5 | 2,82 | 2,48 | -11,9 |
| 3926 | 10,12 | 9,66 | -4,5 | 5,88 | 5,10 | -13,2 |
| Avarage | 5,36 | 4,90 | -8,4 | 3,12 | 2,75 | -11,4 |

Table 24: Avarage Foreign Trade Prices For Plastics End Products ( $ / Ton )

Turkey, with 2,75USD /KG unit export price in 2015, ranked 19th in average export prices of the first 20 exporter countries. This shows that Turkey's exports of plastic is not competitive enough and provide sufficient added value.

| Countries | $/ Kg | Countries | $/ Kg |
|---|---|---|---|
| Japan | 17,2 | Italy | 4,8 |
| USA | 8,9 | Spain | 4,4 |
| Germany | 6,4 | Poland | 4,4 |
| UK | 6,4 | Netherlands | 4,4 |
| France | 6,2 | China | 3,8 |
| Austria | 6,0 | Tailand | 3,4 |
| S.Korea | 5,5 | Turkey ( 2015 ) | 2,8 |
| Chezh Rep. | 5,3 | Mexico | 0,7 |
| Belgium | 5,2 | 20 Countries Avg. | 4,4 |
| Taiwan | 4,9 | Other Countries Avg. | 4,3 |
| Canada | 4,9 | World Average | 4,4 |

Table 25: Average Export Prices of the Export Driving Countries

## 4.15. FOREIGN TRADE SURPLUS IN PLASTICS END PRODUCTS:

Turkey always gives foreign trade surplus in plastic products. Despite the decline of foreign trade surplus in 2015 compared to 2014, has given than 991 thousand tons and USD billion 1,46 by declining 3,4 % on unit base and 22,4 % on value base.

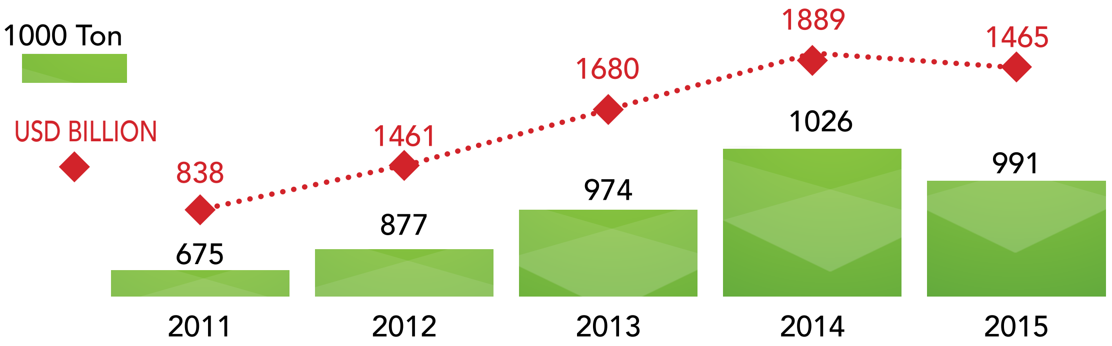



Figure 18: Foreign Trade Surplus For Plastics End Products

### 4.16. PLASTIC END PRODUCTS DOMESTIC MARKET CONSUMPTION

Plastics products domestic market consumption, which was 7,3 million tonnes and 33,3 billion dollars in 2014, realised as 7,6 million tonnes and 31,4 billion dollars in 2015 increasing by 4,1 % on unit base and decreasing by 5,7 % on value base.

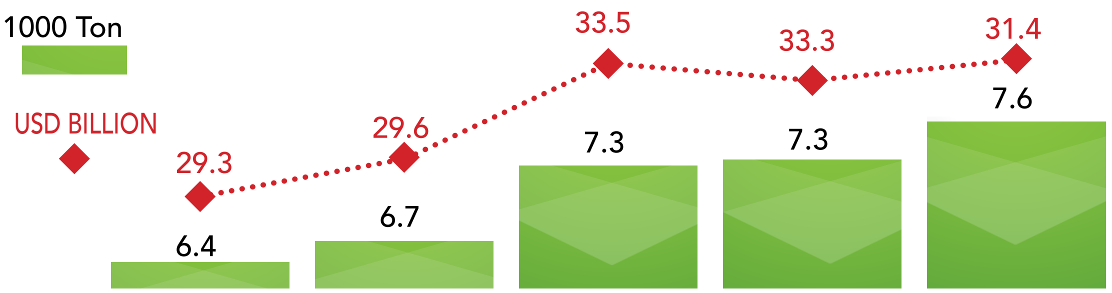



Figure 19: Plastics End Products Domestic Consumption

Approximately 4 million tonnes of 7,6 million tonne plastic product were indirectly exported in 2015 through channels of exporter industries such as automotive, packaging, construction and electronics. The remaining 3,6 million tonne section, on the other hand, was directly consumed by consumers.

When indirect export parts excluded the plastic products consumption per capita in Turkey is expected to rise to 50 kg at the end of 2015. This level of per capita consumption is lower than those of developed western societies however twice the world average. This situation shows that domestic market is profoundly below the saturation point and that potential demand towards plastic consumption in Turkey is quite high.

# 4.17. 2015 GENERAL SUPPLY AND DEMAND EQUILIBRIUM EXPECTATIONS IN PLASTIC PRODUCTS

In 2015, with comparison to 2014, regarding plastic products;

- Production realized as 8,57 million tons and USD billion of 32,9 increasing by 3,2 % on unit basis, decreasing by 6,6 % on value basis,
- Imports realized as 585 thousand tons and USD billion of 2,87 increasing by 1,6 % on unit basis and decreasing by 6,9 % on value basis,
- Exports realized as 1,58 million tons and USD billion of 4,34 by decreasing 1,6 % on unit and 12,8 % on value base,
- Domestic consumption, including those used for indirect export, displayed as 7,58 million tons and USD billion of 31,4 increasing by 4,1 % on unit base and decreasing by 5,7 % on value base.
- Foreign trade surplus decreased to 991 thousand tons and USD billion of 1,47 decreasing by 3,4 % on unit and 22,5 % on value basis,
- 18 % on unit basis and 13 % on value basis of domestic production was exported,
- 8 % on unit basis and 9 % on value basis of domestic consumption, including those used for indirect export, wasmet with imports,
- Export-import coverage ratio, on the other hand, realised as 269 % on unit basis and 151 % on value basis.

| | 2014 | 2015 | % Increase |
|---|---|---|---|
| Production | 8.303 | 8.568 | 3,2 |
| Import | 575 | 585 | 1,6 |
| Export | 1.601 | 1.575 | -1,6 |
| Domestic Consumption | 7.277 | 7.577 | 4,1 |
| Foreign Trade Surplus | 1.026 | 991 | -3,4 |
| Export / Manufacturing ( % ) | 19 | 18 | |
| Import / Domestic Consumption ( % ) | 8 | 8 | |
| Export / Import ( % ) | 278 | 269 | |

Table 26: General Supply and Demand Equilibrium in Plastic End Products (1000 Tons)

| | 2014 | 2015 | % Increase |
|---|---|---|---|
| Production | 35.169 | 32.846 | -6,6 |
| Import | 3.086 | 2.873 | -6,9 |
| Export | 4.976 | 4.338 | -12,8 |
| Domestic Consumption | 33.280 | 31.381 | -5,7 |
| Foreign Trade Surplus | 1.889 | 1.465 | -22,5 |
| Export / Manufacturing ( % ) | 14 | 13 | |
| Import / Domestic Consumption ( % ) | 9 | 9 | |
| Export / Import ( % ) | 161 | 151 | |

Table 27: General Supply and Demand Equilibrium in Plastic End Products (USD Million)

# 5. DEVELOPMENTS IN WORLD PLASTICS RAW MATERIALS INDUSTRY

## 5.1. TOTAL WORLD PLASTICS RAW MATERIALS FOREIGN TRADE VOLUME

Total world foreign trade volume of plastics raw materials has increased at a compound average growth rate (CAGR) of 5,5 % on value base and 2.3 % on unit base between 2010 - 2014 years.
Total world foreign trade volume of plastic raw materials is estimated as 342 million tones and USD billion of 668 in 2015.

Table 28: Total World Foreign Trade Volume of Plastics Raw Materials

Source: ITC, International Trade Center

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million Tons | 306 | 314 | 317 | 329 | 335 | 2,3 | 342 |
| Billion Dolars | 512 | 604 | 584 | 616 | 634 | 5,5 | 668 |

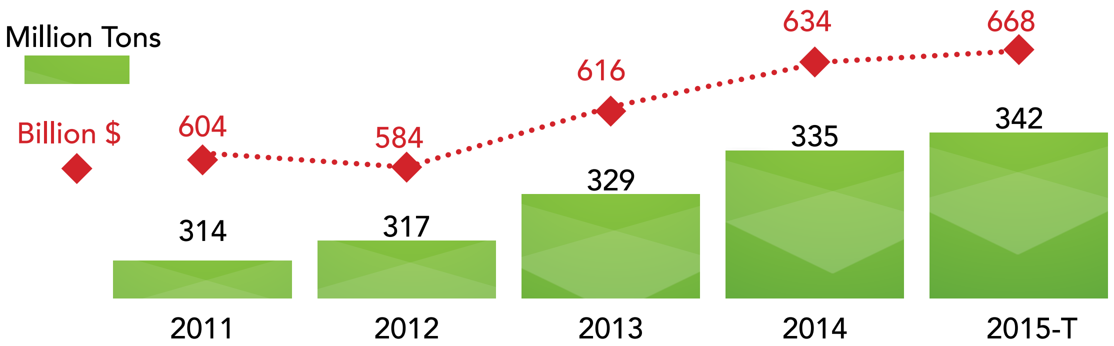



Figure 20: Total World Foreign Trade Volume of Plastics Raw Materials

### 5.2. TOTAL WORLD PLASTICS RAW MATERIALS IMPORTS

Total world imports of plastics raw materials, which was 153 million tones and 262 billion dolars in 2010, has increased at a compound average growth rate (CAGR) of 2,5 % on unit base and 5,6 % on value base between 2010 - 2014 years. Total world imports of plastic raw materials is estimated as 173million tones and USD billion of 344 in 2015

Table 29: Total World Imports of Plastics Raw Materials

Source: ITC, International Trade Center

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million T. | 153 | 157 | 160 | 165 | 169 | 2,5 | 173 |
| Billion Dolar | 262 | 308 | 298 | 313 | 326 | 5,6 | 344 |

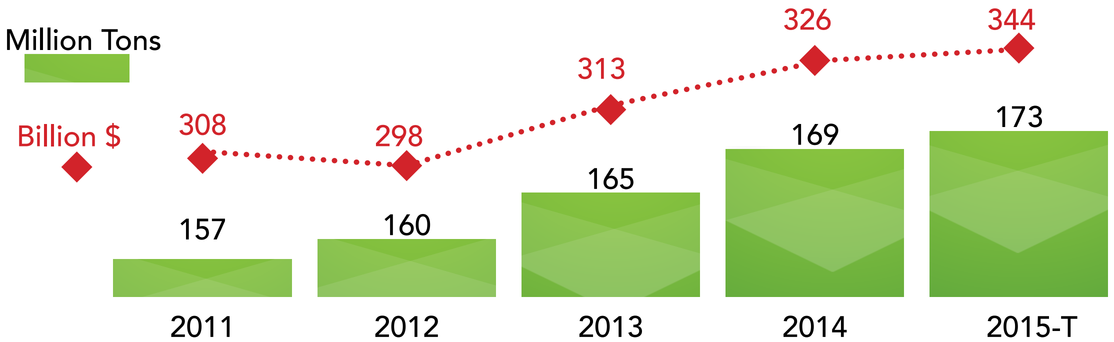



Figure 21: Total World Imports of Plastics Raw Materials

## 5.3. WORLD TOTAL IMPORTS OF PLASTICS RAW MATERIALS BY HS CODE

Plastics raw materials with HS code 390120 shares 9,6 % of total world plastics raw materials in 2014 as 390110 shares 9,3 %, 390210 shares 9 %, 390190 5,4 % and 390690 and 390230 4,6 %.

| HS CODES | HS CODES Description | Billion $ | %Share |
|---|---|---|---|
| 390120 | High- density polyethylene ; specific mass = > 0 , 94 ( the first shape) | 31,2 | 9,6 |
| 390110 | Low density polyethylene ( specific gravity <0 , 94 ( the first figure) | 30,2 | 9,3 |
| 390210 | Polypropylene compounds ( compounds can ); primary forms | 29,2 | 9,0 |
| 390190 | Others ethylene polymers (first figure) | 17,7 | 5,4 |
| 390690 | Other acrylic polymers ( first figure) | 15,1 | 4,6 |
| 390230 | Polypropylene copolymers compounds ( compounds can ); primary forms | 15,0 | 4,6 |
| 390720 | Other polyethers (first figure) | 13,3 | 4,1 |
| 390760 | Polyethylene terephthalate ; The first form of PET | 13,1 | 4,0 |
| 390810 | Polyamide -6 ,-11 ,-12,-6.6 ,-6.9 ,-6.10 or -6.12 compounds ( compounds can ); primary forms | 12,3 | 3,8 |
| 390740 | Polycarbonate ( first figure) | 11,9 | 3,6 |
| | Others | 136,6 | 42,0 |
| | **Total** | **325,5** | **100,0** |

Source: ITC, International Trade Center

Table 30: The First 10 Plastics Raw Materials in Total Imports

# 5.4. TOTAL WORLD PLASTICS RAW MATARIALS IMPORTS BY COUNTRIES

In 2014, 53 % of the world total plastics raw materials imports has been shared by 10 countries on unit basis. On the other hand the first 10 country share 52 % of total imports on value basis in the same year.

While China shares 20 % on quantity base and 18 % of on volume base of total imports, Turkey's share has been realized as 4 % on amount base and 3 % on value base in total imports. The first 5 importing countries are China, Germany, USA, Italy and Turkey.

| | Billion $ | | % Share - Billion $ | | | Million Tonnes | | % Share - Billion Tones | |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2014 | 2010 | 2014 | | 2010 | 2014 | 2010 | 2014 |
| China | 48,7 | 55,1 | 19 | 18 | China | 31,9 | 33,6 | 21 | 20 |
| Germany | 16,9 | 20,4 | 6 | 6 | Germany | 8,6 | 9,6 | 6 | 6 |
| USA | 10,9 | 14,0 | 4 | 5 | USA | 5,7 | 7,3 | 4 | 4 |
| Italy | 12,2 | 13,0 | 5 | 4 | Italy | 7,1 | 6,7 | 5 | 4 |
| Belgium | 10,2 | 12,4 | 4 | 4 | Turkey | 4,7 | 6,0 | 3 | 4 |
| Turkey | 7,7 | 11,0 | 3 | 3 | Hong Kong | 8,9 | 5,8 | 6 | 3 |
| France | 10,3 | 10,6 | 4 | 3 | Belgium | 5,7 | 5,5 | 4 | 3 |
| Mexico | 6,9 | 8,8 | 3 | 3 | India | 3,6 | 5,5 | 2 | 3 |
| India | 5,7 | 7,8 | 2 | 3 | France | 5,0 | 5,0 | 3 | 3 |
| UK | 7,0 | 7,9 | 3 | 3 | Mexico | 3,6 | 4,6 | 2 | 3 |

Source: ITC, International Trade Center

Table 31: Total World Plastics Raw Materials Imports by Countries

| Million Tons - % | | Million $ - % | |
|---|---|---|---|
| China | 20 | China | 18 |
| Germany | 6 | Germany | 6 |
| USA | 4 | USA | 5 |
| Italy | 4 | Italy | 4 |
| Turkey | 4 | Belgium | 4 |
| Hong Kong | 3 | Turkey | 3 |
| Belgium | 3 | France | 3 |
| India | 3 | Mexico | 3 |
| France | 3 | India | 3 |
| Mexico | 3 | UK | 3 |
| Others | 47 | Others | 48 |

Table 32: World Plastics Raw Materials Imports By Countries Million Tons - %

# 5.5. WORLD TOTAL PLASTICS RAW MATERIALS EXPORTS

Total world exports of plastics raw materials, which was 153 million tones and 251 billion dolars in 2010, has increased at a compound average growth rate (CAGR) of 2 % on unit base and 5,3 % on value base between 2010 - 2014 years. Total world exports of plastic raw materials is estimated as 169 million tones and USD billion of 324 in 2015.

| | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR% | 2015 ( T ) |
|---|---|---|---|---|---|---|---|
| Million Tones | 153 | 156 | 157 | 164 | 166 | 2,0 | 169 |
| Billion Dolars | 251 | 296 | 285 | 302 | 308 | 5,3 | 324 |

Table 33: Total World Exports of Plastics Raw Materials

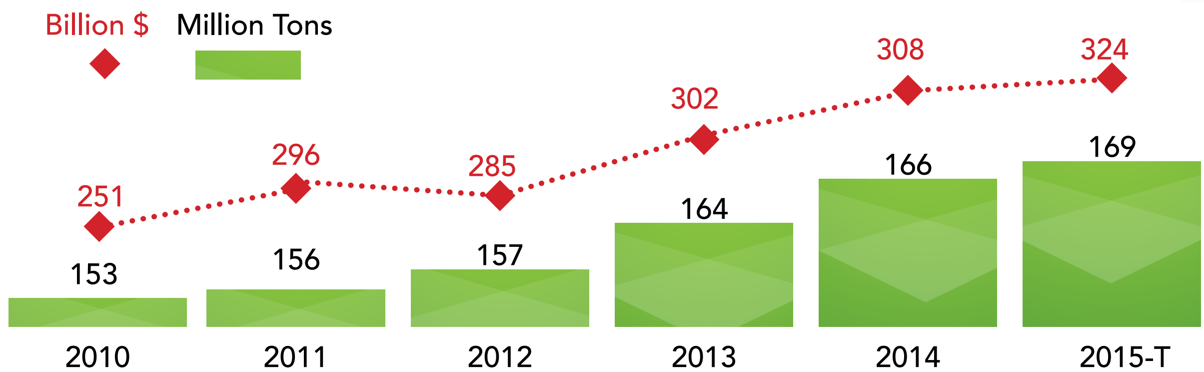



Figure 23: World Total Plastics Raw Materials Exports

Source: ITC, International Trade Center

### 5.6. WORLD TOTAL PLASTICS RAW MATERIALS EXPORTS BY HS CODES

Plastics raw materials with HS code 390120 shares 9,8 % of total world plastics raw materials exports in 2014 as 390110 shares 9,3 %, 390210 shares 9 %, 390190 5,6 % and 390230 5,5 % .

| HS CODES | HS CODES Description | Billion $ | % Share |
|---|---|---|---|
| 390120 | High- density polyethylene ; specific mass = > 0 , 94 ( the first shape) | 30 | 9,8 |
| 390110 | Low density polyethylene ( specific gravity <0 , 94 ( the first figure) | 29 | 9,3 |
| 390210 | Polypropylene compounds ( compounds can ); primary forms | 28 | 9,0 |
| 390190 | Others ethylene polymers (first figure) | 17 | 5,6 |
| 390690 | Polypropylene copolymers compounds ( comp. can ); primary forms | 17 | 5,5 |
| 390230 | Other polyethers (first figure) | 13 | 4,3 |
| 390720 | Other acrylic polymers ( first figure) | 13 | 4,1 |
| 390760 | Polyethylene terephthalate ; The first form of PET | 13 | 4,1 |
| 390810 | PVC Polyvinyl chloride ( complexed) (first figure) emulsion (E- PVC) | 12 | 3,9 |
| 390740 | Polyamide -6 , -11 , -12, -6.6 , -6.9 , -6.10 or -6.12 compounds ( compounds can ); primary forms | 12 | 3,9 |
| | Others | 125 | 40,5 |
| | **Total** | **308** | **100,0** |

Source: ITC, International Trade Center

Table 34: World Total Plastics Raw Materials Exports By HS Codes

# 5.7. TOTAL WORLD PLASTICS RAW MATERIALS EXPORTS BY COUNTRIES

in 2014, the first 10 exporter countries shared 62 % on unit base and 66 % on value base of total world plastics raw materials exports. USA, Saudi Arabia, Germany S. Korea and Belgium are the first exporting countries on unit base while USA, Germany, Belgium, S. Korea and S. Arabia consist of the first main exporters on value bases.

| | Billion $ | | Billion $ - % Share | | | Million Tones | | Million Tones - % Share | |
|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2014 | 2010 | 2014 | | 2010 | 2014 | 2010 | 2014 |
| USA | 32 | 36 | 13 | 12 | USA | 17 | 17 | 11 | 10 |
| Germany | 21 | 25 | 9 | 8 | Saudi Arabia | 10 | 12 | 7 | 7 |
| Belgium | 21 | 24 | 8 | 8 | Germany | 11 | 12 | 8 | 7 |
| S. Korea | 18 | 23 | 7 | 7 | S. Korea | 10 | 12 | 7 | 7 |
| Saudi Arabia | 11 | 19 | 4 | 6 | Belgium | 11 | 11 | 7 | 7 |
| Netherlands | 14 | 18 | 6 | 6 | Netherlands | 7 | 8 | 5 | 5 |
| China | 8 | 14 | 3 | 5 | Taiwan | 7 | 7 | 5 | 5 |
| Singapore | 9 | 14 | 4 | 5 | China | 4 | 7 | 2 | 5 |
| Taiwan | 13 | 14 | 5 | 5 | Singapore | 5 | 7 | 3 | 5 |
| Japan | 13 | 12 | 5 | 4 | Hong Kong | 8 | 6 | 6 | 4 |

Source: ITC, International Trade Center

Table 35: Total World Raw Materials Exports by Countries

| Million T. % | | Billion $ - % | |
|---|---|---|---|
| USA | 10 | USA | 12 |
| Saudi Arabia | 7 | Germany | 8 |
| Germany | 7 | Belgium | 8 |
| S.Korea | 7 | S.Korea | 7 |
| Belgium | 7 | Saudi Arabia | 6 |
| Netherlands | 5 | Netherlands | 6 |
| Tayvan | 5 | China | 5 |
| China | 5 | Singapore | 5 |
| Singapore | 4 | Taiwan | 4 |
| Hong Kong | 4 | Japan | 4 |
| Others | 39 | Others | 35 |

Table 36: World Plastics Raw Materials Exports By Countries - % Ton

# 6. TURKISH PLASTICS RAW MATERIAL INDUSTRY
## 6.1. PLASTIC RAW MATERIAL MANUFACTURING

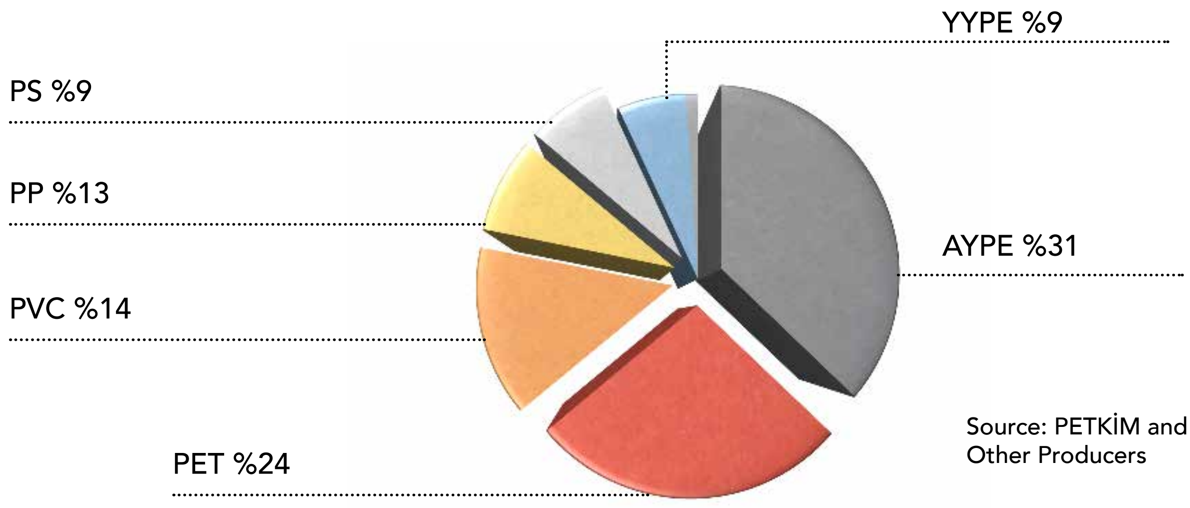
Plastic raw material manufacturing, in 2015 ended with approximately 1 million and 14 thousand tonnes.

| | 1000 Ton |
|---|---|
| **AYPE** | **314** |
| **YYPE** | **91** |
| **PE Total** | **405** |
| **PP** | **132** |
| **PVC** | **142** |
| **PS** | **91** |
| **PET** | **243** |
| **Total Production** | **1.014** |

Table 37: Manufacturing of Plastics Raw Materials (2015)

Source: PETKİM and Other Producers

31 % of the total plastic raw materials produced in 2015 in Turkey is LDPE. On the other hand 24 % of the production is PET, 14 % PVC, 9 % PS, 9 % HDPE.




Source: PETKİM and Other Producers

Figure 24: Plastics Raw Materials Production By Types - 2015

# 6.2. PLASTIC RAW MATERIALS IMPORT:

In 2015, 6,3 million tons of plastics raw materials was imported with a value of USD billion of 9,4. Imports increased by 3,7 % on unit base while decreased by 15,1 % on value base.

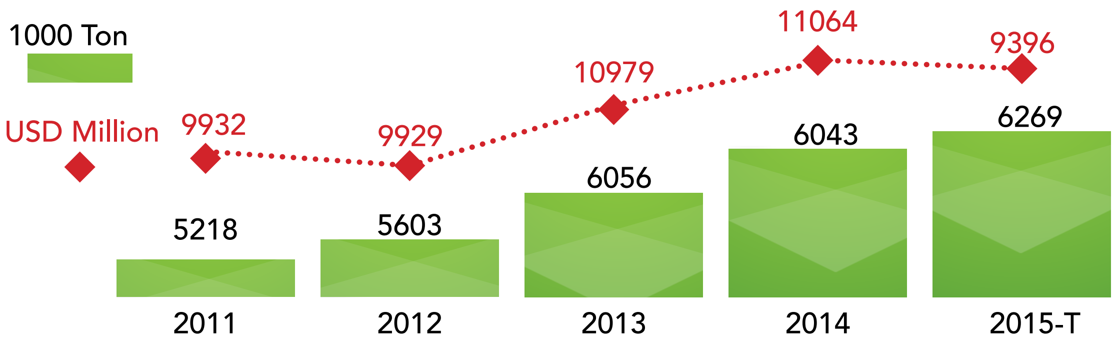



Figure 25: Plastics Raw Materials Imports

In 2015 the raw materials in the 3901 and 3902 HS group shared the biggest part of the total imports on unit base.

| HS CODES | PLASTIC RAW MATERIAL DEFINITIONS | 2014 | 2015 | % Increase |
|---|---|---|---|---|
| 3901 | ETHYLENE POLYMERS (INITIAL FORMS) | 1.499 | 1.600 | 6,8 |
| 3902 | PROPYLENE AND POLYMERS OF OTHER OLEFINS (INITIAL FORMS) | 1.899 | 1.943 | 2,3 |
| 3903 | STYRENE POLYMERS (INITIAL FORMS) | 476 | 512 | 7,4 |
| 3904 | OTHER OLEFIN POLYMERS WITH VINYL CHLORIDE/HALOGENOUS | 892 | 834 | -6,6 |
| 3905 | VINYL ACETAT/POLYMERS OF OTHER VINYL ESTERS (INITIAL FORMS) | 35 | 42 | 19,8 |
| 3906 | ACRYLIC POLYMERS (INITIAL FORMS) | 194 | 198 | 2,1 |
| 3907 | POLYACETALS, OTHER POLYETHERS, EPOXIDE-ALKYD RESINS (INITIAL FORMS) | 545 | 628 | 15,1 |
| 3908 | POLYAMIDES (INITIAL FORMS) | 91 | 87 | -4,5 |
| 3909 | AMINO RESINS, PHENOLIC RESINS, POLYURETHANES (INITIAL FORMS) | 205 | 217 | 5,6 |
| 3910 | SILICONES (INITIAL FORMS) | 29 | 30 | 3,9 |
| 3911 | PETROLEUM RESINS, COUMARONE, INDENE/COUMARONE-INDENE RESIN, POLYTERPENES | 28 | 29 | 3,5 |
| 3912 | CELLULOSE AND CHEMICAL DERIVATIVES (INITIAL FORM) | 36 | 39 | 5,7 |
| 3913 | NATURAL POLYMERS, MODIFIED NATURAL POLYMERS, DERIVATIVES (INITIAL FORMS) | 4 | 3 | -14,6 |
| 3914 | POLYMER BASED ION EXCHANGERS (INITIAL FORM) | 6 | 6 | 5,7 |
| 3915 | WASTES, RESIDUALS AND SCRAPS FROM PLASTIC | 105 | 104 | -1,2 |
| | **PLASTIC RAW MATERIALS TOTAL** | 6.269 | 3,7 | |

Table 38: Plastics Raw Materials Imports by HS Codes (1000 Ton)

On the other hand in the same period the raw materials also in the 3901 and 3902 HS group shared the biggest part of the total imports on value base.

| HS CODES | PLASTIC RAW MATERIAL DEFINITIONS | 2014 | 2015 | % Increase |
|---|---|---|---|---|
| 3901 | ETHYLENE POLYMERS (INITIAL FORMS) | 2.618 | 2.406 | -8,1 |
| 3902 | PROPYLENE AND POLYMERS OF OTHER OLEFINS (INITIAL FORMS) | 3.314 | 2.650 | -20,0 |
| 3903 | STYRENE POLYMERS (INITIAL FORMS) | 974 | 795 | -18,3 |
| 3904 | OTHER OLEFIN POLYMERS WITH VINYL CHLORIDE/HALOGENOUS | 1.022 | 816 | -20,1 |
| 3905 | VINYL ACETAT/POLYMERS OF OTHER VINYL ESTERS (INITIAL FORMS) | 103 | 100 | -3,5 |
| 3906 | ACRYLIC POLYMERS (INITIAL FORMS) | 452 | 370 | -18,0 |
| 3907 | POLYACETALS, OTHER POLYETHERS, EPOXIDE-ALKYD RESINS (INITIAL FORMS) | 1.280 | 1.174 | -8,3 |
| 3908 | POLYAMIDES (INITIAL FORMS) | 288 | 213 | -26,2 |
| 3909 | AMINO RESINS, PHENOLIC RESINS, POLYURETHANES (INITIAL FORMS) | 534 | 447 | -16,3 |
| 3910 | SILICONES (INITIAL FORMS) | 127 | 111 | -12,6 |
| 3911 | PETROLEUM RESINS, COUMARONE, INDENE/COUMARONE-INDENE RESIN, POLYTERPENES | 99 | 89 | -9,6 |
| 3912 | CELLULOSE AND CHEMICAL DERIVATIVES (INITIAL FORM) | 166 | 150 | -9,1 |
| 3913 | NATURAL POLYMERS, MODIFIED NATURAL POLYMERS, DERIVATIVES (INITIAL FORMS) | 28 | 23 | -16,9 |
| 3914 | POLYMER BASED ION EXCHANGERS (INITIAL FORM) | 14 | 14 | 0,3 |
| 3915 | WASTES, RESIDUALS AND SCRAPS FROM PLASTIC | 45 | 36 | -21,4 |
| | PLASTIC RAW MATERIAL TOTAL | 11.064 | 9.396 | -15,1 |

Table 39: Plastics Raw Materials Imports by HS Codes (Million $)

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

# 6.3. PLASTIC RAW MATERIAL IMPORT BY COUNTRIES

Turkey imports plastics raw materials from over 100 countries. 10 countries comprised approximately 66 % on amount basis and 68 % on value basis of total imports in 2014.

In 2015, the share of the first 10 import partners decreased to % 63 on unit base where as 66 % on value base. S. Arabia, S. Korea and Germany ranked as the top 3 country in total plastic raw material imports and these 3 countries received a total share of 32 % on unit base and % 35 on value base within our total national plastic raw material import in 2015.

| | 2014 | | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1000 Ton | USD Million | Ton-% | $-% | | 1000T. | USD Million | Ton-% | $-% |
| S. Arabia | 1.022 | 1.705 | 17 | 15 | S. Arabia | 977 | 1.309 | 15,6 | 13,9 |
| S. Korea | 586 | 1.129 | 10 | 10 | S. Korea | 607 | 973 | 9,7 | 10,4 |
| Germany | 399 | 1.021 | 7 | 9 | Germany | 411 | 882 | 6,6 | 9,4 |
| Belgium | 386 | 744 | 6 | 7 | Belgium | 383 | 606 | 6,1 | 6,5 |
| Italy | 242 | 543 | 4 | 5 | Iran | 352 | 456 | 5,6 | 4,9 |
| France | 315 | 525 | 5 | 5 | Italy | 238 | 439 | 3,8 | 4,7 |
| Iran | 305 | 505 | 5 | 5 | Spain | 263 | 407 | 4,2 | 4,3 |
| Spain | 277 | 499 | 5 | 5 | Netherlands | 226 | 404 | 3,6 | 4,3 |
| Netherlands | 206 | 471 | 3 | 4 | France | 282 | 395 | 4,5 | 4,2 |
| USA | 269 | 414 | 4 | 4 | USA | 218 | 310 | 3,5 | 3,3 |
| 10 Countries | 4.007 | 7.555 | 66 | 68 | 10 Countries | 3.956 | 6.181 | 63,1 | 65,8 |
| Others | 2.036 | 3.510 | 34 | 32 | Others | 2.313 | 3.215 | 36,9 | 34,2 |
| **Total** | **6.043** | **11.064** | **100** | **100** | **Total** | **6.269** | **9.396** | **100,0** | **100,0** |

Source : Turkish Statistics Department

Table 40: Main Import Partners for Plastics Raw Materials

## 6.4.PLASTIC RAW MATERIAL EXPORT:

698 thousand tons and 933 million dollars of plastic raw material was exported in 2015 increasing 2,6 % on unit base and decreasing 17 % on value base compared with 2014.

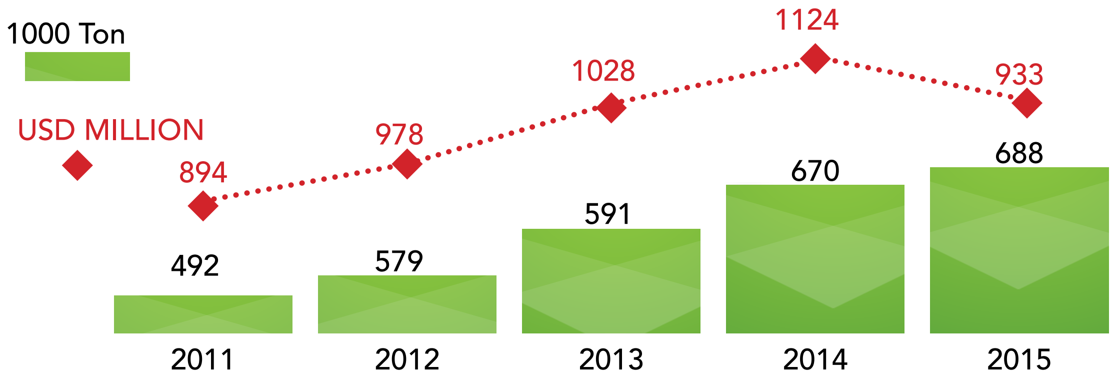



Figure 26: Plastics Raw Materials Exports

Source: Turkish Statistics Department

In 2015 the raw materials taking part in 3906 and 3907 HS codes shared the biggest part of total exports on both unit and value base.

| HS CODES | PLASTIC RAW MATERIAL DEFINITIONS | 2014 | 2015 | % Increase |
|---|---|---|---|---|
| 3901 | ETHYLENE POLYMERS (INITIAL FORMS) | 72 | 35 | -50,9 |
| 3902 | PROPYLENE AND POLYMERS OF OTHER OLEFINS (INITIAL FORMS) | 21 | 28 | 34,1 |
| 3903 | STYRENE POLYMERS (INITIAL FORMS) | 24 | 32 | 30,1 |
| 3904 | OTHER OLEFIN POLYMERS WITH VINYL CHLORIDE/HALOGENOUS | 22 | 18 | -17,6 |
| 3905 | VINYL ACETAT/POLYMERS OF OTHER VINYL ESTERS (INITIAL FORMS) | 36 | 47 | 29,1 |
| 3906 | ACRYLIC POLYMERS (INITIAL FORMS) | 151 | 167 | 10,3 |
| 3907 | POLYACETALS, OTHER POLYETHERS, EPOXIDE-ALKYD RESINS (INITIAL FORMS) | 195 | 201 | 3,1 |
| 3908 | POLYAMIDES (INITIAL FORMS) | 13 | 13 | 1,5 |
| 3909 | AMINO RESINS, PHENOLIC RESINS, POLYURETHANES (INITIAL FORMS) | 66 | 77 | 16,3 |
| 3910 | SILICONES (INITIAL FORMS) | 5 | 6 | 16,9 |
| 3911 | PETROLEUM RESINS, COUMARONE, INDENE/COUMARONE-INDENE RESIN, POLYTERPENES | 0 | 1 | 32,4 |
| 3912 | CELLULOSE AND CHEMICAL DERIVATIVES (INITIAL FORM) | 43 | 45 | 3,6 |
| 3913 | NATURAL POLYMERS, MODIFIED NATURAL POLYMERS, DERIVATIVES (INITIAL FORMS) | 0 | 0 | 12,1 |
| 3914 | POLYMER BASED ION EXCHANGERS (INITIAL FORM) | 0 | 0 | 73,3 |
| 3915 | WASTES, RESIDUALS AND SCRAPS FROM PLASTIC | 20 | 18 | -10,9 |
| | **PLASTIC RAW MATERIAL TOTAL** | 670 | 688 | 2,6 |

Source: Turkish Statistics Department

Table 41: Plastics Raw Materials Exports by HS Codes (1000 Ton)

| HS CODES | PLASTIC RAW MATERIAL DEFINITIONS | 2014 | 2015 | % Increase |
|---|---|---|---|---|
| 3901 | ETHYLENE POLYMERS (INITIAL FORMS) | 111 | 52 | -52,7 |
| 3902 | PROPYLENE AND POLYMERS OF OTHER OLEFINS (INITIAL FORMS) | 34 | 39 | 14,3 |
| 3903 | STYRENE POLYMERS (INITIAL FORMS) | 42 | 42 | -0,1 |
| 3904 | OTHER OLEFIN POLYMERS WITH VINYL CHLORIDE/HALOGENOUS | 28 | 20 | -26,5 |
| 3905 | VINYL ACETAT/POLYMERS OF OTHER VINYL ESTERS (INITIAL FORMS) | 41 | 42 | 2,1 |
| 3906 | ACRYLIC POLYMERS (INITIAL FORMS) | 229 | 199 | -13,3 |
| 3907 | POLYACETALS, OTHER POLYETHERS, EPOXIDE-ALKYD RESINS (INITIAL FORMS) | 410 | 330 | -19,4 |
| 3908 | POLYAMIDES (INITIAL FORMS) | 13 | 13 | 1,5 |
| 3909 | AMINO RESINS, PHENOLIC RESINS, POLYURETHANES (INITIAL FORMS) | 33 | 26 | -21,5 |
| 3910 | SILICONES (INITIAL FORMS) | 100 | 91 | -9,5 |
| 3911 | PETROLEUM RESINS, COUMARONE, INDENE/COUMARONE-INDENE RESIN, POLYTERPENES | 19 | 20 | 4,3 |
| 3912 | CELLULOSE AND CHEMICAL DERIVATIVES (INITIAL FORM) | 2 | 2 | 13,3 |
| 3913 | NATURAL POLYMERS, MODIFIED NATURAL POLYMERS, DERIVATIVES (INITIAL FORMS) | 56 | 52 | -7,0 |
| 3914 | POLYMER BASED ION EXCHANGERS (INITIAL FORM) | 1 | 1 | -8,0 |
| 3915 | WASTES, RESIDUALS AND SCRAPS FROM PLASTIC | 0 | 0 | 136,4 |
| | **PLASTIC RAW MATERIAL TOTAL** | 1.124 | 933 | -17,0 |

Source: Turkish Statistics Department

Table 42: Plastics Raw Materials Exports by HS Codes (USD Million)

### 6.5. PLASTIC RAW MATERIAL EXPORTS BY COUNTRIES:

Turkey exports plastic raw material to over 100 countries and 10 countries received a share of 54 % both on amount and value basis within total export in 2014. On the other hand, 10 export partners share declined to 50 % of total raw materials exports in 2015. Germany, Egypt and Russian Federation ranked as the top 3 countries in plastics raw material exports in this period on unit and value base.

| 2014 | | | | | 2015 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1000Ton | USD Million | Ton-% | $-% | | 1000Ton | USD Million | Ton-% | $-% |
| Germany | 65 | 122 | 10 | 11 | Germany | 66 | 93 | 10 | 10 |
| Italy | 58 | 89 | 9 | 8 | Egypt | 61 | 66 | 9 | 7 |
| Russian Fed. | 30 | 75 | 5 | 7 | Russian Fed. | 31 | 63 | 5 | 7 |
| Egypt | 53 | 72 | 8 | 6 | Iran | 21 | 47 | 3 | 5 |
| Bulgaria | 49 | 48 | 7 | 4 | Italy | 37 | 46 | 5 | 5 |
| Iran | 17 | 46 | 2 | 4 | Bulgaria | 52 | 39 | 7 | 4 |
| Azerbaijan | 24 | 44 | 4 | 4 | Israel | 25 | 29 | 4 | 3 |
| Iraq | 22 | 43 | 3 | 4 | Romania | 22 | 28 | 3 | 3 |
| Israel | 26 | 39 | 4 | 3 | Iraq | 18 | 28 | 3 | 3 |
| Romania | 19 | 30 | 3 | 3 | Uzbekistan | 13 | 27 | 2 | 3 |
| 10 Countries | 363 | 609 | 54 | 54 | 10 Countries | 345 | 466 | 50 | 50 |
| **Total** | **670** | **1.124** | **100** | **100** | **Total** | **688** | **933** | **100** | **100** |

Table 43: Plastics Raw Materials Exports by Countries

## 6.6. PLASTIC RAW MATERIAL FOREIGN TRADE UNIT PRICES

Plastic raw material average unit import price in 2015 was 1.50 USD / Kg and displayed a decrease of 18,1 % according to 2014 averages. In the same period, plastic raw material average unit export price was 1.36 USD / Kg and displayed a decrease by 19,1 % according to 2014.

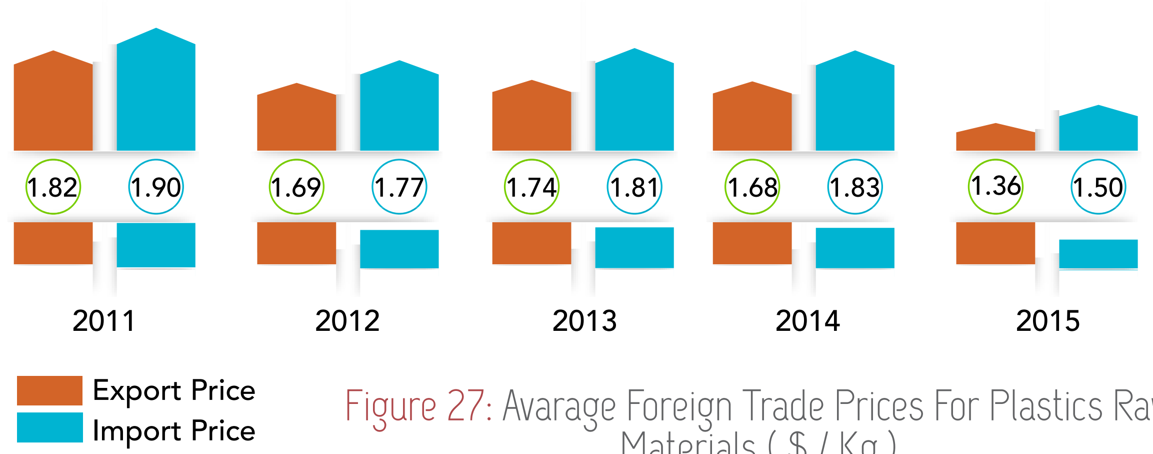



Figure 27: Avarage Foreign Trade Prices For Plastics Raw Materials ( $ / Kg )

Turkey's plastic raw material unit prices are approximately 10 % higher than export prices. In other words, while Turkey is importing plastic raw materials with high added values, she exports with low ones.

| | Import Price | | | Exports Price | | |
|---|---|---|---|---|---|---|
| HS CODES | **2014** | **2015** | **%Incre.** | **2014** | **2015** | **% increase** |
| 3901 | 1,75 | 1,50 | -13,9 | 1,54 | 1,48 | -3,6 |
| 3902 | 1,75 | 1,36 | -21,8 | 1,62 | 1,38 | -14,7 |
| 3903 | 2,04 | 1,55 | -23,9 | 1,71 | 1,31 | -23,2 |
| 3904 | 1,15 | 0,98 | -14,5 | 1,29 | 1,15 | -10,9 |
| 3905 | 2,93 | 2,36 | -19,5 | 1,14 | 0,90 | -20,9 |
| 3906 | 2,33 | 1,87 | -19,7 | 1,51 | 1,19 | -21,4 |
| 3907 | 2,35 | 1,87 | -20,4 | 2,10 | 1,64 | -21,8 |
| 3908 | 3,17 | 2,45 | -22,7 | 2,56 | 1,98 | -22,7 |
| 3909 | 2,60 | 2,06 | -20,7 | 1,51 | 1,18 | -22,2 |
| 3910 | 4,45 | 3,74 | -15,9 | 3,56 | 3,18 | -10,7 |
| 3911 | 3,58 | 3,13 | -12,7 | 4,61 | 3,95 | -14,4 |
| 3912 | 4,54 | 3,91 | -14,0 | 1,29 | 1,16 | -10,3 |
| 3913 | 7,85 | 7,64 | -2,7 | 7,46 | 6,12 | -18,0 |
| 3914 | 2,59 | 2,45 | -5,1 | 2,27 | 3,09 | 36,5 |
| 3915 | 0,43 | 0,34 | -20,5 | 0,88 | 0,89 | 1,2 |
| **Avarage** | **1,83** | **1,50** | **-18,1** | **1,68** | **1,36** | **-19,1** |

Table 44: Plastics Raw Materials Average Import and Export Prices By HS Codes ($ / Ton)

## 6.7. PLASTICS RAW MATERIALS FOREIGN TRADE DEFICIT

Turkey is a country that always gives foreign trade deficit in plastic raw materials trade. Foreign trade deficit for plastics raw materials in 2015 stood at 5,6 million tons and USD billion 7,6 increasing by 3,8 % on unit base and decreasing by 14,5 % on value base.

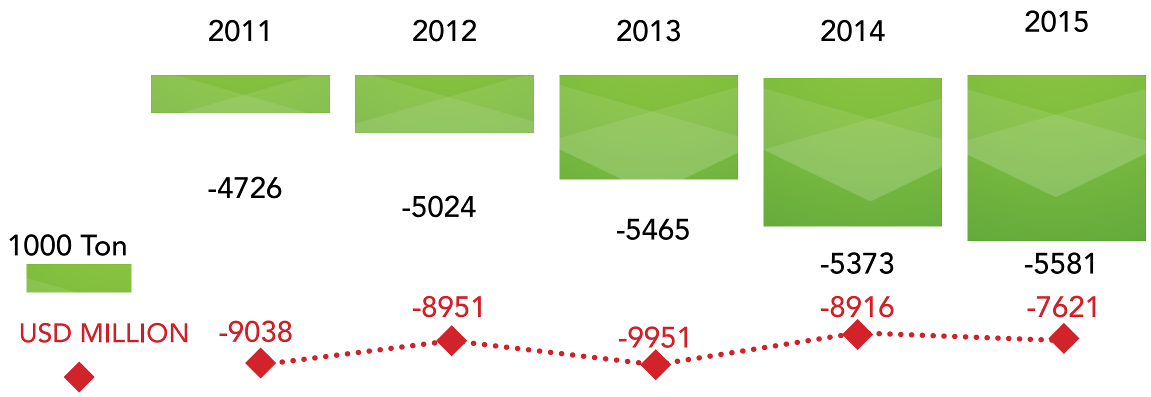



Figure 28: Plastics Raw Materials Foreign Trade Deficit

### 6.8. PLASTICS RAW MATERIALS DOMESTIC CONSUMPTION

Plastics raw materials domestic consumption realized as 6 million 595 thousand tons and 9,41 billion dollars increasing by 3,2 % on unit base and decreasing by 15,9 % on value base.

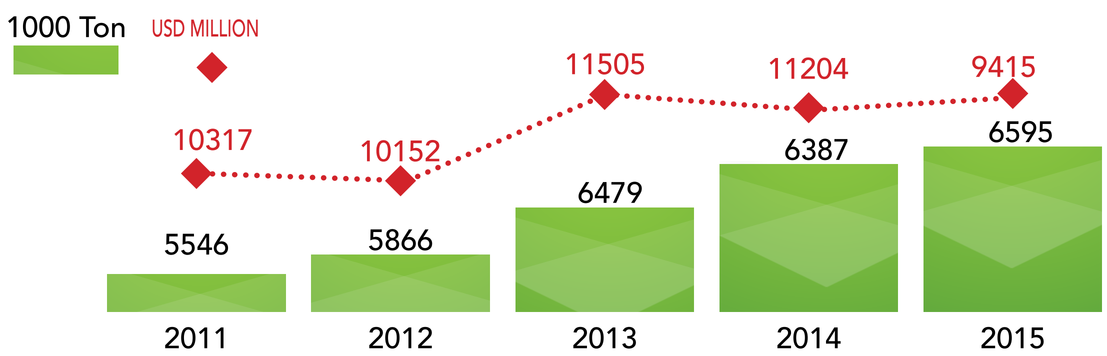



Figure 29: Plastics Raw Materials Domestic Consumption

# 6.9.PLASTIC RAW MATERIAL GENERAL SUPPLY AND DEMAND EQUILIBRIUM EXPECTATIONS FOR 2015

In plastics raw materials industry as of 2015 compared to 2014:

- Domestic manufacturing preserved the 2014 levels,
- Imports increased to 6,27 million tons by increasing 3,7 %
- Exports increased to 688 thousand tons increasing by 2,6 %
- Domestic consumption increase to 6,6 million tonnes with an increase of 3,3 %,
- Foreign trade deficit increased to 5,59 million tonnes by increasing 3,9 %,
- The share of imports within total supply realised as 86 %,
- The export-import coverage ratio realised as 11 %.

| | 2014 | 2015 | % Increase |
|---|---|---|---|
| Production | 1.014 | 1.014 | 0,0 |
| Import | 6.043 | 6.269 | 3,7 |
| Exports | 670 | 688 | 2,6 |
| Domestic Consumption | 6.387 | 6.595 | 3,3 |
| Foreign Trade Deficit / Surplus | -5.373 | -5.581 | 3,9 |
| Export / Manufacturing ( % ) | 86 | 86 | |
| Import / Domestic Consumption ( % ) | 11 | 11 | |

Table 45: General Supply and Demand Equilibrium for Plastics Raw Materials (1000 Ton)

# 7.CONCLUSION

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

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

- Under current circumstances, attainment of 17 billion dollars of export seems extremely difficult. However, the realisation of export on such levels, in parallel with its growth, the industry must take measures which will increase its unit export prices, which cruises around 3 $ / Kg to 4.5 $ / Kg, average of developed countries alongside with making the best of the investment incentives.

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

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

- The companies which can't compete with the change in prices due to increasing global competition, must issue the "Costs of the Competition" to the forefront, to increase profitability.

- To create a successful competition that makes the difference in cost, it is necessary to implement changes in the changing world beyond the known method of saving techniques.

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

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

For this purpose;

- Incentive opportunities must be increased as the plastics industry is in need of technological and R&D investments.
- Strategic investments must be included within the plastics industry, regardless of the foreign trade data and minimum investment amount must be specified as 5 million USD.
- Plastics industry must ensure greater portion of its raw material needs from the Middle East and European countries. Sector, although met with only 14% of domestic production needs , in order to protect domestic production , more affordable price of the raw material supply facilities , are deprived of putting taxes on imports. In this case, for the protection of domestic producers of raw materials, reducing the competitive global market and export opportunities in the sector. Domestic producers, instead of putting taxes on imports of raw materials must be protected by applying incentives to reduce production and investment costs.
- The barriers to imports should be removed for plastic raw material production which does not meet the requirements.
- Exports are declining. According to the new conditions, the incentive mechanism for exports must be revised.
- Plastics industry regardless of the external trade data should be incorporated into strategic investment and the minimum investment amount shall be determined as of 5 million dollars.
- The local base of operations in the production of plastic products due to a more rational, the plastics industry should be supported in at least one city in each region.
- For the provision of qualified staff in the industry, the necessary measures should be taken.

# NOTES :

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