The Chemicals Industry in Turkey

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Glossary of Terms

Acronym	Definition
ACP	The African, Caribbean and Pacific Group of States
ADSL	Asymmetric Digital Subscriber Line
ALOSBİ	Aliağa Organized Industrial Zone
BAĞFAŞ	Bandırma Fertilizer Industry
BMI	Business Monitor International
BOSAD	The Association of Paint Industry
BTK	Information and Communication Technology Authority
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CBRT	The Central Bank of the Republic of Turkey
CEFIC	The European Chemical Industry Council
CT	Communication Technology
EEC	Examination and Evaluation Center
EFTA	The European Free Trade Association
EIA	Environmental Impact Assessment
EIU	Economist Intelligence Unit
EU	European Union
EUR	Euro
FDI	Foreign Direct Investment
FOB	Free On Board

Acronym	Definition
FTA	Free Trade Agreements
GDP	Gross Domestic Product
GEBKİM	Gebze-Kocaeli Chemical Organized Industrial Zone
GITES	The Input Supply Strategy
GÜID	The Association for Fertilizer Producers and Importers
ICT	Information and Communication Technology
IGEME	Turkish Export Promotion Center
IGSAŞ	Istanbul Fertilizer Industry
IMMIB	Istanbul Mineral and Metals Exporters' Association
ISO	International Organization for Standardization
ISPAT	Investment Support and Promotion Agency of Turkey
ITU	Istanbul Technical University
JCR	Japan Credit Rating Agency
KIMYAGER	The Chemist Society
KTSD	The Association of Cosmetics and Cleaning Products Industrialists
LPG	Liquefied Petroleum Gas
M&A	Mergers and Acquisitions

Glossary of Terms

Acronym	Definition
MTA	The General Directorate of Mineral Research and Exploration of Turkey
N/A	Not Available
NAFTA	The North American Free Trade Agreement
NGOs	Non-Governmental Organizations
O/N	Overnight
OECD	Organization for Economic Co-operation and Development
OIZ	Organized Industrial Zone
OPEX	Operating Expense
ÖSYM	Student Selection and Placement Center
PAGEV	Turkish Plastics Industry Foundation
PE	Polyethylene
PET	Polyethylene Terephthalate
PLASFED	Turkish Plastics Industrialists' Federation
PP	Polypropylene
PVC	Polyvinyl Chloride
R&D	Research and Development
RUSF	Resource Utilization Support Fund
S&P	Standard and Poor's
SME	Medium Sized Enterprises
TC	Republic of Turkey

Acronym	Definition
TEM	Trans European Motorway
TKD	Turkish Chemical Society
TDZ	Turkish Development Zone
TIM	Turkish Exporters Assembly
TKSD	Turkish Chemical Manufacturers Association
TL	Turkish Lira
TMMOB	Union of Chambers of Turkish Engineers and Architects
TOBB	Union of Chambers and Commodity Exchanges of Turkey
TSE	Turkish Standards Institute
TTDK	Technology Development Foundation of Turkey
TÜBITAK	The Scientific and Technological Research Council of Turkey
TÜPRAŞ	Turkish Petroleum Refineries
TÜRKAK	Turkish Accreditation Agency
TurkStat	Turkish Statistics Institute
UK	United Kingdom
USA	United States of America
USD	United States Dollar
VAT	Value Added Tax
VTS	Vocational Training School

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Executive Summary

- Turkey has sustained robust macroeconomic growth in recent years thanks to the government's ambitious economic growth program. According to international economic organizations, it is expected to sustain this growth over the next 5 years. The OECD forecasts that real GDP growth to increase approximately 4% in 2014 and 2015, while EIU expects an annual average growth rate in real GDP to be about 5% in the short term.
- Turkey has ambitious 2023 targets for the chemical industry which include reaching USD 50 billion in chemical exports, thus capturing 0.79% share of the global chemicals market. The government has also launched a strategic action plan for the chemical industry in order to reduce the industry's import dependency.
- Turkey's chemical industry's production growth has exceeded the growth levels of the overall economy, suggesting other growth factors independent of the local economy. The industry grew at a CAGR of 11% from 2006 to 2011, reaching approximately USD 37 billion in 2011.
- Value added at factor costs for Turkey's manufacturing of chemicals and chemical products and the manufacturing of plastics and rubber products reached USD 3.4 billion and USD 3.9 billion, respectively in 2011.
- As demand for chemical manufacturing products increased so did the amount of production, resulting in capacity utilization rates of 80%, while capacity utilization of the manufacture of rubber and plastic products were 72%.
- Turkey has over 27 million young, well-educated and motivated professionals. Half the population is under 30 years of age (with 7.5 million people between the ages of 24 and 34) and with competitive wage rates of USD 551 per month as of October 2013. 8,000 undergraduate and graduate students earned a degree directly linked to chemistry or chemical engineering at the end of the 2011-2012 academic year.
- The numbers of technology development zones, organized industrial districts and R&D centers have multiplied over the years. At the end of 2013, there were a total of 50 TDZs, 263 OIZs and 142 R&D centers in the country.
- Turkey's investment incentive program divides Turkey into six separate regions and supports investors in the industry by providing varying tax reductions, between 15-65%, depending on investment region, scale and investment type.
- The government has also launched a strategic action plan for the chemical industry in order to reduce the industry's import dependency.

A. Overview of the Industry in the World and in Turkey

i. A Brief Global Overview of the Chemicals Industry

ii. Macroeconomic Indicators in Turkey

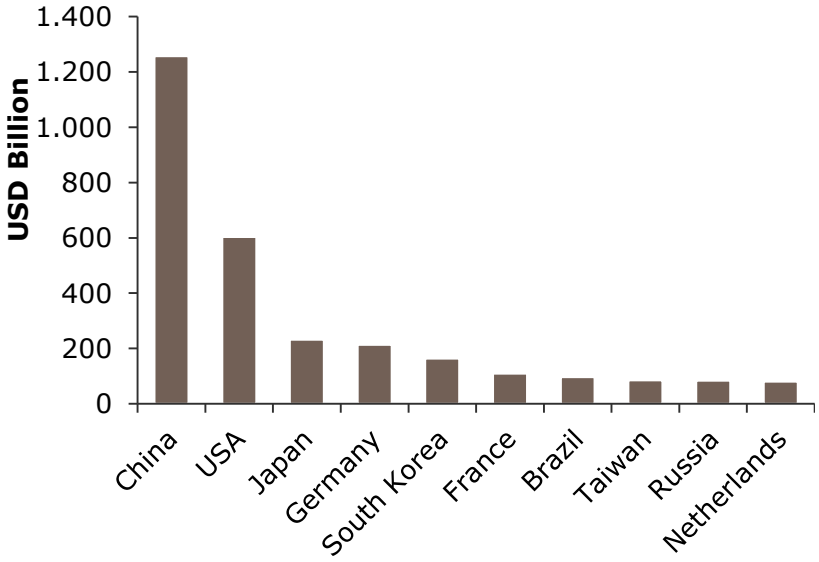
iii. FDI Inflow to the Chemicals Industry in Turkey

iv. Overview of Turkey's Chemicals Industry

v. Major Stakeholders in Chemicals Industry

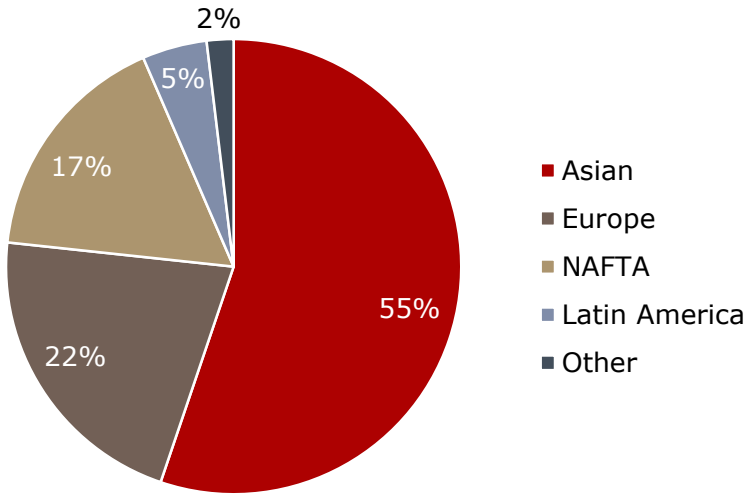
Global chemical sales surpassed USD 4.1 trillion* in 2012.

Figure 1: Chemical Sales by Country, 2012



Source: CEFIC, CBRT
Note: Converted using 2012 year-end EUR/USD exchange rate of 1.3193.

Figure 2: World Chemical Sales Geographic Breakdown, 2012



Source: CEFIC

- Global sales of chemicals was valued at more than USD 3,400 billion** in 2011 and grew to more than USD 4,120* billion in 2012.
- China was by far the largest seller of chemicals in 2012 amounting to more than USD 1,256* billion followed by USA with USD 603 billion* and Japan with USD 232 billion*.
- Asian countries dominated chemicals sales. Twelve of the top 30 countries selling chemicals are Asian countries, constituting approximately 49.6% of the total global chemicals sales and 55.7% of the 30 top producing markets.

• Converted using 2012 year end EUR/USD exchange rate of 1.3193
** Converted using 2011 year end EUR/USD exchange rate of 1.2938

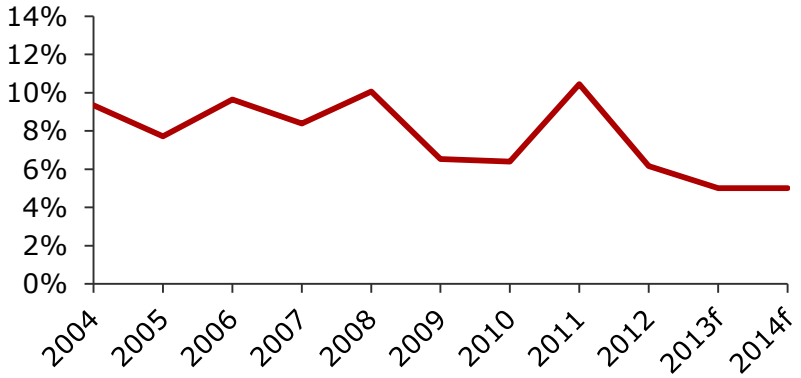
Turkey's fast-growing economy is expected to attract more investments in the future.

- Turkey has undergone a profound economic transformation over the last decade and its economic foundation is quite solid. It is the 17th largest economy in nominal terms and the 16th largest economy in purchasing power parity terms in the world. Moreover, it is the 6th largest economy compared to the EU in 2012 with a current GDP of approximately USD 786 billion in 2012. This is nearly a triple increase, in nominal terms in GDP per capita in ten years.
- Having boomed as fast as 9.3% and 8.8% in real terms in 2010 and 2011, the OECD projects a real GDP growth of around 4% in 2014 and 2015, while EIU projects an average 5% growth year-to-year until 2017.
- Monetary policy played a vital role in reining in inflation in recent years. Turkish inflation has stayed under 10% since 2004 and the year-end inflation rate was 6.2% in 2012. The government's efforts to tame inflation have paid off over the last decade and the CBRT projects an inflation rate of 5% in 2013 and 2014.

Figure 3: GDP Growth Rate (Constant Prices)

Source: Turkstat, EIU
f: forecast

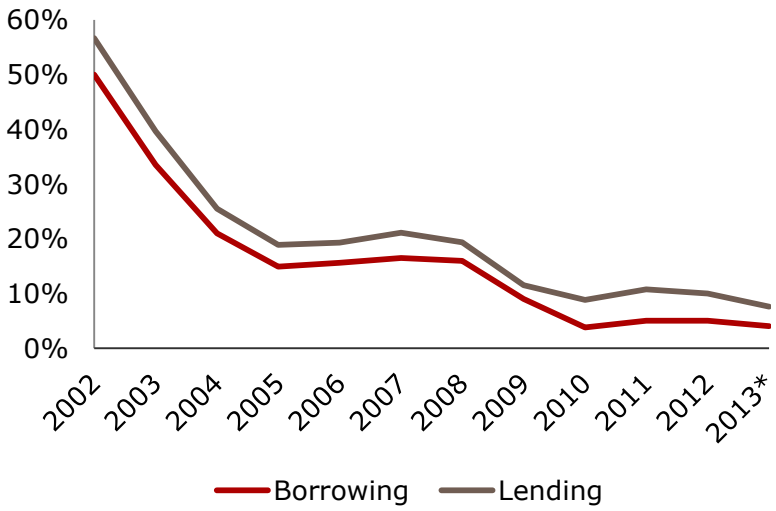
Figure 4: Inflation



Source: Turkstat , CBRT
f: forecasts of CBRT

The investment environment in Turkey has become more welcoming to foreign investors.

Figure 5: The Central Bank of the Republic of Turkey O/N Interest Rates



Source: CBRT
* As of September 2013

- Fitch Ratings announced that Turkey's investment grade rating was BBB in November 2012 and Standard & Poor's announced a BB+ rating in March 2013. These events signal further upgrades and are expected to boost the inflow of institutional funding.
- Moody's raised Turkish government bond ratings to Baa3 and revised its outlook to stable from positive in May 2013.

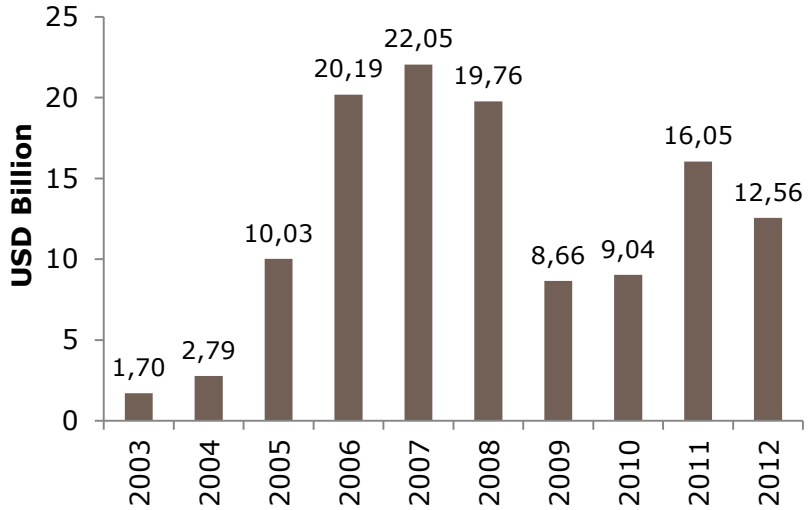
Table 1: Turkey's Credit Ratings

Rating Agency	Rating (Local Currency)	Outlook (Local Currency)	Rating (Foreign Currency)	Outlook (Foreign Currency
Standard & Poor's	BBB	Stable	BB+	Negative
Fitch	BBB	Stable	BBB-	Stable
Moody's	Baa3	Stable	Ba1	Positive
JCR	BBB-	Stable	BBB-	Stable

Source: Moody's (May 2013), S&P (February 2014), Fitch (December 2013), JCR (May 2013)

Turkey's FDI in the chemicals industry increased CAGR 24% from 2003 to 2012.

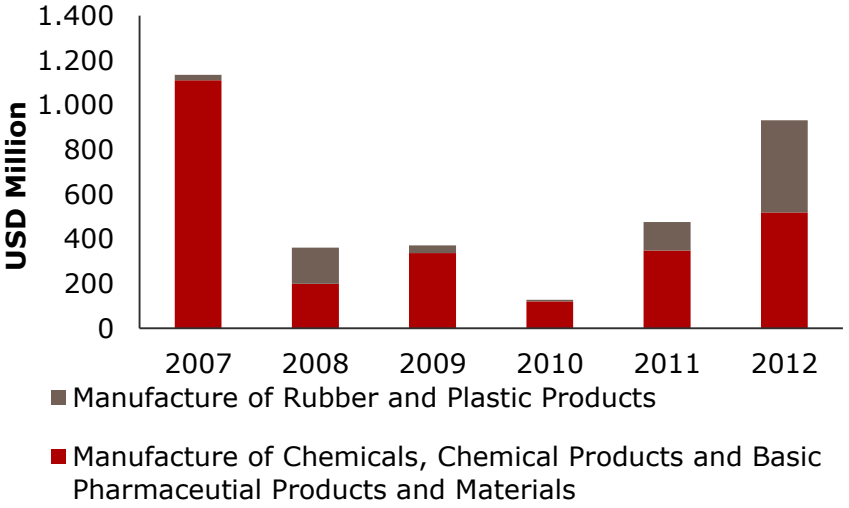
Figure 6: FDI Inflows to Turkey, 2003-2012



Source: World Development Indicators, World Bank DataBank

- Turkey has become an attractive destination for FDI. FDI inflows were weak after 2002, but then began to increase incrementally and reached a record level of USD 22 billion in 2007. A decrease in 2009 can be explained by the global crisis which lowered FDI all around the globe including Turkey. However, from economic indicators from 2009 onwards, Turkey has shown it has rebounded effectively. Impressed by the attractive investment environment in Turkey, foreign direct investors have been flooding the market over the past decade.

Figure 7: FDI in the Chemical Manufacturing Industry in Turkey



Source: CBRT

- In 2012, Turkey attracted **USD 12.56 billion** worth of FDI, which is a CAGR 24% increase from 2003.
- Turkey had the highest amount of FDI in chemical manufacturing in 2007 with more than USD 1.1 billion. Moreover, Turkey was able to attract an impressive level of FDI to the chemicals industry. FDI inflows to the industry increased CAGR 27% from 2008 to 2012 nearing almost USD 1 billion in 2012.

Major M&A's in Turkish chemicals industry from 2010 to 2013 accounted for more than USD 800 million

Table 2: M&As in the Chemicals Industry from 2010-2013

Acquirer	Origin	Target	Stake	Deal Value (USD million)	Year
Georg Fischer	Switzerland	Hakan Plastik	96%	98.1	2013
SOCAR	Azerbaijan	Petkim	10.3%	168.5	2012
Yves Rocher	France	Flormar	51%	135.0	2012
Nitto Denko Corporation	Japan	Bento Bantçılık	100%	100.0	2012
Dow Chemicals	USA	Aksa Karbon Elyaf Sanayi	50%	92.5	2011
Greif	USA	Sunjüt	100%	80.3	2010
Dabur India	India	Hobi Kozmetik, Zeki Plastik, Ra Pazarlama	100%	69.0	2010
EGGER Group	Austria	Roma Plastik	72%	58.0	2010

Source: Deloitte Annual Turkish M&A Review

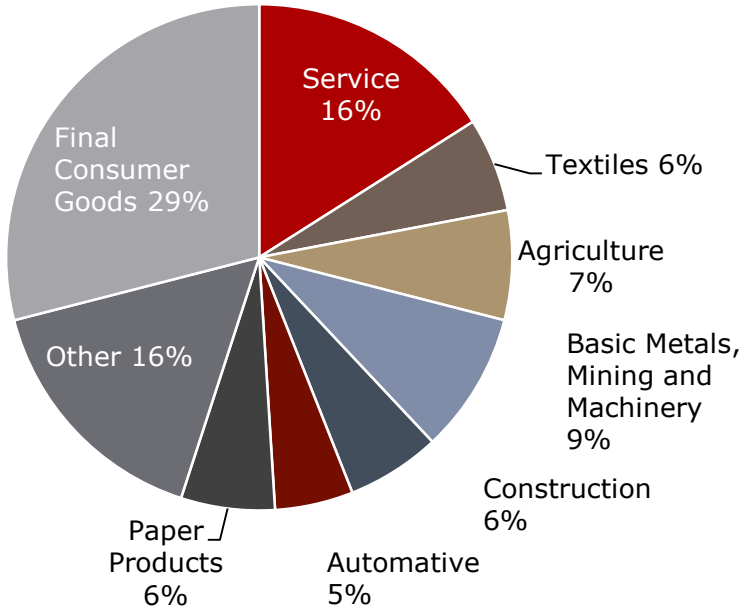
The largest M&A deal in chemicals industry in 2008 was the acquisition of Petkim with an amount of more than USD 2 billion by Socar

Acquirer	Origin	Target	Stake	Deal Value (USD million)	Year
Azells	Luxembourg	Tara Kimya	100%	N/A	2008
BASF Coatings	Germany	Yaşar Basf Otomotiv Boyaları	50%	N/A	2008
Brenntag	Germany	Aromaster, Trend Gıda	N/A	N/A	2008
Socar & Turcas Petrokimya A.Ş.	Azerbaijan	Petkim Petrokimya Holding A.Ş.	51%	2,040	2008

Source: Deloitte Annual Turkish M&A Review, Petkim

The chemicals industry feeds many other industries in Turkey.

Figure 8: Distribution of Chemical Outputs Across Various Industries in Turkey in 2012



Source: TKSD

- The chemicals industry has a unique position in the manufacturing industry as it not only manufactures end products such as plastics, cosmetics and pharmaceuticals, but also supplies intermediate products for countless other industries.
- The chemicals industry supplies products for numerous sectors. In 2012, chemical outputs were mostly used in final consumer goods with a 29% share, followed by the service sector with 16%, the basic metals, mining, machinery and electronics sector with 9%, and the agriculture industry with 7%.

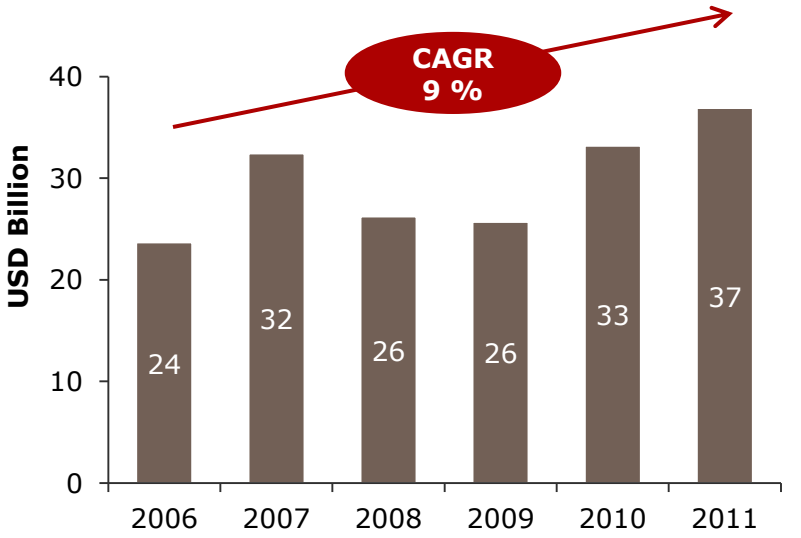
Turkey's chemicals industry will grow as these industries continue to improve.

Construction	• Repaints and new paints are estimated to make 85% and 15% respectively of total paint consumption in Turkey. • In line with the "Urban Transformation" law, which came into effect in 2013, 6.5 million residences will be undergoing renovation. The estimated cost of the renovations to be undertaken within the context of the law adds up to an estimated USD 400 billion, which will contribute to the expansion of the construction industry forecasted to grow at a CAGR of 11%.
Vehicles	• Turkey is the largest producer of light commercial vehicles and the second largest manufacturer of buses in Europe. Vehicle production will increase at a CAGR of 4.9% until 2017. In 2013, the production rate grew 5%, the market grew by 5.3% and exports increased 14% from 2012. • The paint and coating sub-sector will benefit from the increase in vehicle production. Moreover, the automotive industry uses 11% plastic and around 6% rubber* when manufacturing their vehicles. The industry's demand for plastics is expected to increase 50% by 2016 and reach 9.8 million tonnes.
Textiles & Apparel	• Textiles, leather and clothing output represented 7.9% of Turkish manufacturing and approximately 1.6% of the country's GDP in 2012. • The textiles industry uses around 4% of plastic produced during its own production process.
Home Appliances	• With a production capacity of 25 million units and an estimated production of 21.7 million units in 2012, the home appliances sector has become a significant focus of production. Turkey has become a leader in Europe in the home appliances sector. • 6% of the total plastics produced was used by producers of major appliances.
Packaging & Printing	• There is a direct correlation between the amount of plastics packaging created and the amount of ink required for that packaging. • Growth in the food sector has led to increasing demand for corrugated carton packaging. • In 2012, the packaging sector had the highest share in total plastics usage with 40% of total plastics produced being used in this sector.

Source: IGEME, BOSAD, BMI, PAGEV, Deloitte Analysis, OSD, Turkstat
*: 2012 PLASFED

Turkey has seen a surge in chemical production reaching nearly a double digit growth rate from 2006 to 2011.

Figure 9: Chemical Production in Turkey

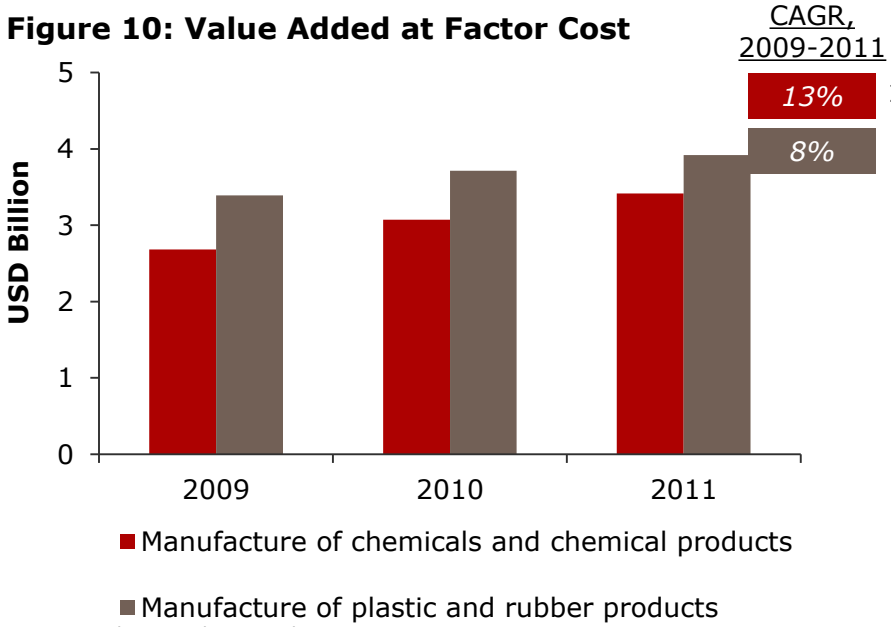


- Turkey's substantial economic growth combined with industry's strong positioning offer ample growth opportunities for Turkey's chemicals industry.
- Production value soared increasing by a CAGR as high as 9% between 2006 and 2011, reaching nearly USD 37 billion in 2011. The increase from 2010 to 2011 was a staggering 11%, showing great promise for the future.

Source: Turkstat, Deloitte Analysis
Note: HS Codes 27,28,29,31,32,33,34,35,36,37,38,39,40 were used in the analysis.
Some of the items were not disclosed according to the relevant article of Turkish Statistical Law No. 5429, confidential data cannot be disclosed.
Note: Year -end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

Turkey is concentrating on increasing the value added in the chemicals industry.

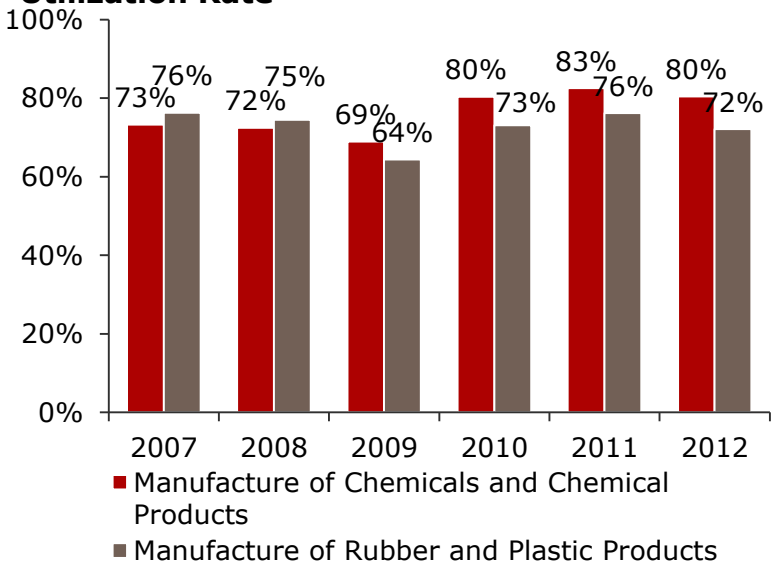
Figure 10: Value Added at Factor Cost



Source: Turkstat, Deloitte Analysis
Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889). NACE Rev. 2 Code 20 and 22 were used.

- The value added at factor costs for Turkey's manufacturing of chemicals and chemical products, and manufacturing of plastics and rubber products reached USD 3.4 billion and USD 3.9 billion, respectively in 2011.

Figure 11: The Weighted Average of Capacity Utilization Rate

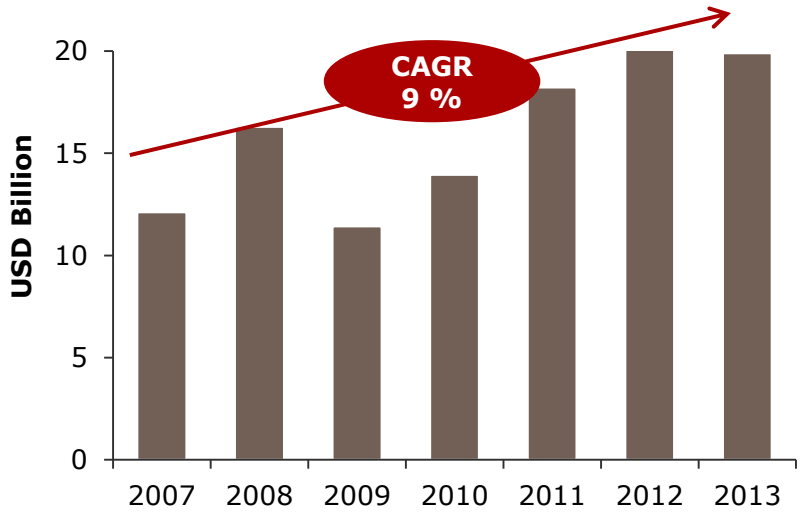


Source: CBRT

- The capacity utilization of the chemical manufacturing industry increased significantly starting from 2007. As demand for chemical products rose so did the amount of production, resulting in capacity utilization rates of 80%, while capacity utilization in the manufacturing of rubber and plastic products was 72%.

Turkey's exports grew with incredible momentum reaching CAGR 11% between 2007 and 2012.

Figure 12: Turkey's Chemicals Industry Exports, 2007-2012



Source: Turkstat, Deloitte Analysis
Note: HS codes 27,28,29,31,32,33,34,35,36,37,38,39,40 were used in the analysis

Figure 13: Top 10 Countries for Chemicals Industry Exports, 2013

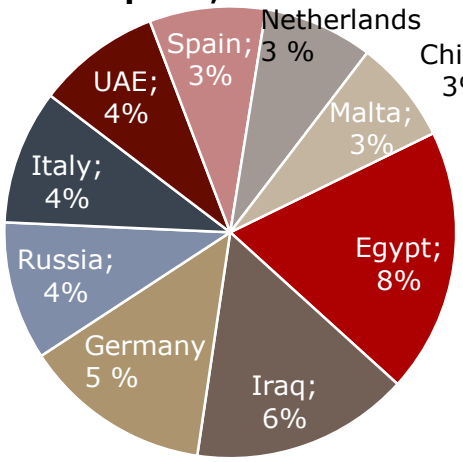
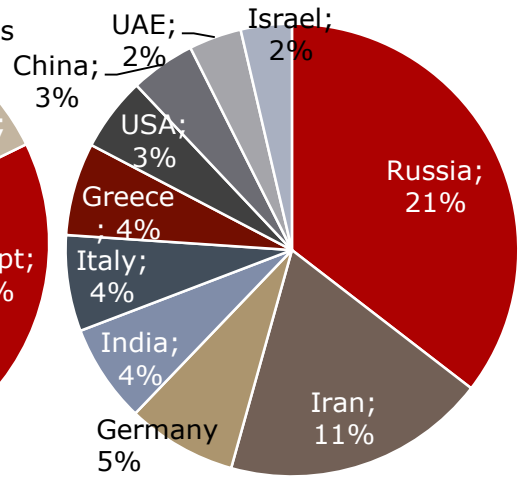


Figure 14: Top 10 Countries of Chemicals Industry Imports, 2013



- Turkey's customer base is diverse as it exports to the EU, the Middle East and Eastern Europe.
- Turkey's export growth reached double digits as it increased from USD 12 billion in 2007 to more than USD 20 billion in 2012.
- Proximity to neighboring markets and increasing demand in these markets placed Turkey in a very strategic vantage point. Egypt was Turkey's largest export market constituting 9.4% of total exports, followed by Iraq with almost 6% and Germany with approximately 5%.
- Turkey's chemical imports increased from more than USD 55 billion in 2007 to more than USD 90 billion in 2012, indicating a CAGR 10% growth during these years. Turkey's primary import partner is Russia with a 36% share, followed by Iran with 21% and Italy and Germany with 8% and 7%, respectively. Total imports retracted to USD 88 billion in 2013.

Major Chemicals Industry Institutions in Turkey

Name	Logo	Web Page	What They Do
Türk Plastik Sanayicileri Araştırma, Geliştirme ve Eğitim Vakfı - PAGEV **Turkish Plastics Industry Foundation**		http://www.pagev.org.tr/	PAGEV follows the latest developments in plastics production techniques throughout the world. Its main aim is help the sector conform to world standards and to contribute to the development of local plastics production.
Boya Sanayicileri Derneği - BOSAD **The Association of Paint Industry**		http://en.bosad.org/	BOSAD mission is to contribute to the development of the Turkish paint and coatings industry, to increase national paint consumption, to provide consumers with modern and eco-friendly products, and to contribute to the EU integration process on a sectorial basis.
Gübre Üreticileri ve İthalatçıları Derneği - GÜİD **Association for Fertilizer Producers and Importers**		http://www.guid.org.tr/	GÜID raises awareness of problems within fertilizer production as well as covering issues regarding import and export by organizing seminars and fairs in Turkey. Moreover, it ensures proper adaptation of the sector to the regulations published by EU and local regulations.
Temizlik ve Kozmetik Ürünleri Sanayicileri Derneği - KTSD **The Association of Cosmetics and Cleaning Products Industrialists**		http://www.ktsd.org.tr/	KTSD's mission is to support the development of the cosmetics and cleaning products industry in Turkey as well as to ensure consumers' access to healthy, reliable and high-quality products by raising overall awareness.
Plastik Sanayicileri Federasyonu - PLASFED **Turkish Plastics Industrialists' Federation**		http://www.plasfed.org.tr	PLASFED's mission is to inform the industry about subjects that include regulations, taxes, technology, employment, personnel, health and safety. It oversees plastics production so it is sustainable and eco-friendly as well as creating public awareness for this process.

Major Chemicals Industry Institutions in Turkey(2)

Name	Logo	Web Page	What They Do
Türkiye Kimya Sanayicileri Derneği - TKSD **Turkish Chemical Manufacturers Association**		http://www.tksd.org.tr/	TKSD holds discussions and negotiations with government authorities and the representatives of the Turkish chemical industry both nationally and internationally.
Kimyagerler Derneği – KİMYAGER **The Chemist Society**		http://www.kimyager.org/	KIMYAGER organizes seminars and panels in universities and within industrial entities in order to create a highly skilled workforce in the industry.
Türkiye Kimyagerler Derneği - TKD **Turkish Chemical Society**		http://www.turchemsoc.org/	TKD has been in operation since 1919. The society has many objectives including supporting cooperation between foreign and Turkish institutions and providing up-to-date information on every subject within chemicals industry.
TMMOB Kimya Mühendisleri Odası – TMMOB Chamber of Chemical Engineers		http://www.kmo.org.tr/	The Chamber consists of 12 representatives in various cities in Turkey and aims to protect natural resources, create growth in agricultural production, protect the rights of consumer and contribute to the development of chemical engineering.

B. Overview of the Chemicals Industry's Sub-Sectors

i) The Paint and Coatings Sector
ii) The Fertilizer Sector
iii) The Detergent, Cosmetics and Personal Care Sector
iv) The Plastics Sector
v) The Rubber Sector
vi) The Inorganic Chemicals Sector

The Paint and Coatings Sector:
Turkey's paint sector is ranked 6th largest in Europe.

Figure 15: Production Value of Turkey's Paint and Coatings Sector

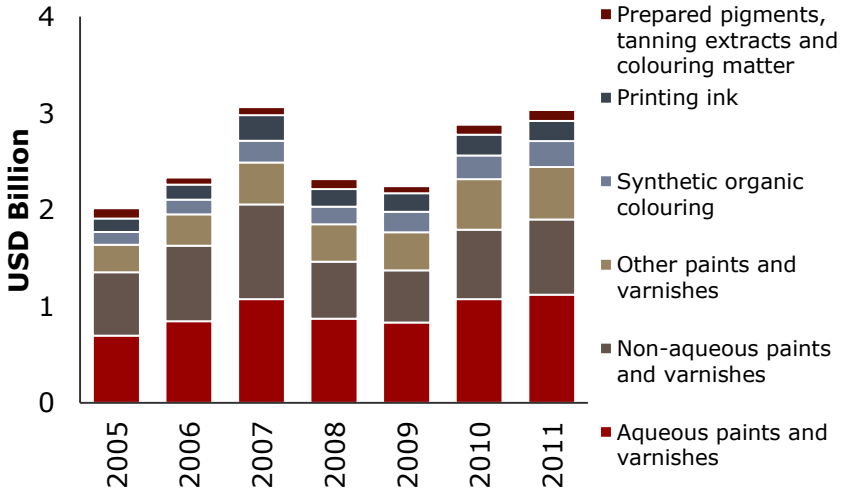


Table 3: Volume of Production (Thousand Tonnes)

Sub-Sectors	2007	2008	2009	2010	2011
Aqueous Paints and Varnishes	385	417	379	513	579
Non-Aqueous Paints and Varnishes	364	280	250	330	403
Other Paints and Varnishes	573	565	663	644	985
Printing Ink	60	51	45	58	62
Prepared Pigments and Opacifiers	31	34	31	59	73

- Turkey makes up approximately 2% of the global paint industry and is ranked as the **sixth largest paint producer in Europe**. Its market size was over **2 million tonnes** and its value accounted for more than **USD 3 billion** in 2011. According to the Ministry of Economy, the annual paint consumption per capita in Turkey was 11 kg in 2012.
- The sector has been growing at a fast pace over recent years. The sector grew with staggering growth rates of 28% and 5% in 2010 and 2011, respectively. The industry reached a total production value of **USD 3 billion in 2011**, equivalent to a **CAGR of 7%** since 2005.
- The Turkish paint industry is expected to continue its growth as rapid urbanization results in an ever increasing need for housing facilities. Moreover, a major urban redevelopment plan, which will in turn demolish some 6.5 million buildings in 20 years, is underway. As new buildings are constructed to replace those which will be demolished, the construction sector will also grow to meet the growing demand along with the paint industry.
- Moreover, according to BMI, the construction industry's value is expected to increase CAGR 11% from 2012 to 2022.

Source: Turkstat, BOSAD, Deloitte Analysis

Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

Paint and Coatings Sector:
Exports increased by a CAGR of 14% from 2007 to 2012.

Figure 16: The Paint and Coatings Sector, Foreign Trade

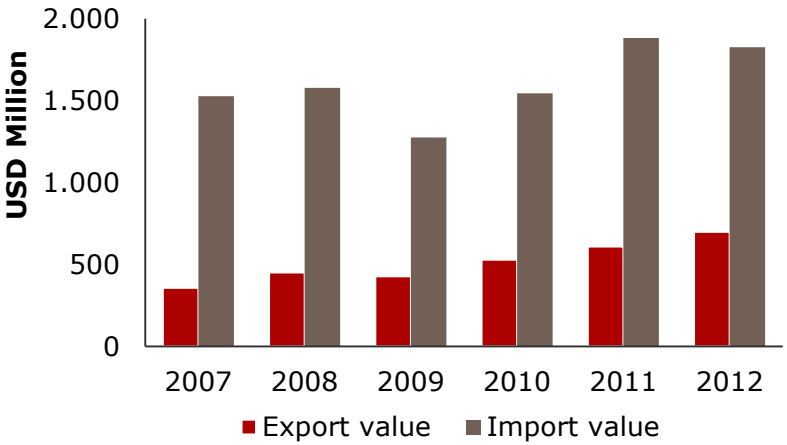
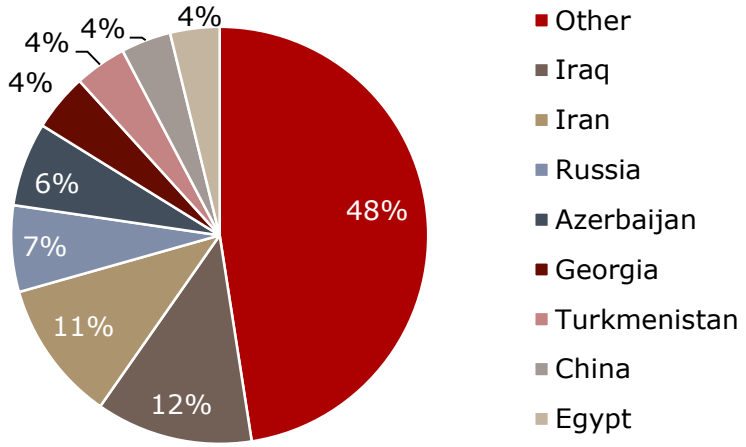


Figure 17: Top 10 Export Countries, The Paint and Coatings Sector 2012



Source: Turkstat, Deloitte Analysis

Note: HS Code 32 was used in the analysis.

- Turkey's paint **exports exceeded USD 700 million in 2012** from USD 610 million in 2011, increasing 15%. The year-over-year growth rate for paint and coatings exports has been positive and totaling at least 15% since the economic recession in 2009. Total **exports** increased at a **CAGR of 14%** from 2007 to 2012. The majority of exports in 2012 were to neighbouring markets such as Iraq (12%), Iran (11%), Russia (7%) and Azerbaijan (6.5%).
- Import values fluctuated between USD 1.5-1.8 billion during the past five years. Turkey's **paint imports reached USD 1.82 billion in 2012**, decreasing slightly compared to the previous year. The CAGR of the past five years has been low, equaling **4%**. Top import countries for 2012 were Russia (32%), Iran (18%), Italy (5%), Greece (4%) and India (4%).
- According to the Ministry of Economy, 39% of the paint and coatings output were used for decorative purposes, followed by the metal industry with 17% and transportation with 12%. The rest of its industrial use in Turkey, includes powder, printing ink, industrial wood and marine applications.

The Paint and Coatings Sector:
Selected Players

DYO Boya Fabrikaları

- DYO Boya was founded in 1954. It has two paint factories, one in Gebze Dilovası and the other in Izmir Atatürk Organized Industrial Zone. Their headquarters are also in Izmir. The majority of its shares are held by Yaşar Holding.
- DYO Boya is the first Turkish producer to use nanotechnology in the paint sector. It is the leading manufacturer of Teflon-coated paint.

Net Sales 2012:
USD 260 million

Polisan Boya

- Founded in 1985, Polisan Boya has a production capacity of 180,000 tonnes per annum as of 2012.
- The company has shown its concern for the environment and general health-related issues by creating water-based oil paint and developing the water-based paint mixing machine.
- Polisan Boya is the first developer of interior paint with seven unique features and exterior paints with nine features

Revenue in 2012:
USD 165 million

Kansai Altan Boya

- Kansai Altan was founded in 2007. Their headquarters are located in Izmir. The firm employees a staff of 529.
- Kansai has divided its production activity into 4 parts: automotive paint (42%), industrial paint (29%), paint used in construction (20%) and water and protective paints (9%).
- Kansai's R&D investments have paid off with market-leading products, making it an important player in the industry.

Revenue in 2012:
USD 159 million

PPG

- Founded in 1883, PPG produces coatings nad speciality products. It operates in nearly 70 countries around the world. Sales in 2012 were USD 15.2 billion globally.
- In Turkey, PPG produces and markets full line of coatings products and related services for automotive repair and refurbishing. The company's production facility in Turkey is in Bursa.

Revenue in 2012:
USD 15.2 billion*

Source : ISO 500 2012, DYO, Polisan, Kansai Altan, PPG
Note: Dyo, Polisan and Kansai Altan's annual revenues were converted to USD based on year end FX rate of 1.7776
* Global revenue of PPG

A Success Story: Betek Boya ve Kimya Sanayi

"There is an ongoing search for a new center for Western Europe that is based in the East. Turkey can become this new center for the paint sector. There is great opportunity in the Turkish market, for paint products and the insulation products as well. Only 6-7% of 16 million buildings are insulated."

Betek General Manager, Tayfun Küçükoğlu

Source: Interview in emlaktasondakika.com

- Betek Boya ve Kimya Sanayi was founded in 1993 as a joint venture with the German company, Caparol, the top name in the paint sector in Europe.
- Caparol's turnover from Turkey is greater than the company's total turnover from 24 other countries.
- By introducing European technology to the paint and coatings market, Betek became a leader in architectural paints and thermal insulation systems in Turkey with roughly 1,000 workers and 3,000 outlets.
- Betek Boya offers customized products of high quality utilizing advanced technology.
- Betek's annual revenue was USD 388 million* in 2012 and ranked 107th in ISO 500 2012 list.
- The company opened the Dr. Robert Murjahn Institute Scientific Research Center in 2007, which provides testing services on paint and coating products and is an accredited laboratory. The company had contributed to national R&D since 1993 in compliance with EU standards.
- The Kayseri production plant that opened in 2012 has a capacity of 150,000 tonnes and produces heat insulation systems equal to 36 million m^3.

* Converted at year end USD/TL exchange rate of 1.7776

A Success Story: Sika Yapı Kimyasalları A.Ş

- Sika was founded in 1910 in Switzerland by Kaspar Winkler, today serves in 80 countries with its 100 companies. It is active in processing materials used in sealing, bonding, damping, reinforcing and protecting load-bearing structures.
- Sika entered Turkey market in 1990. Since then, it has increased its production capacity consistently.
- Sika Turkey has two major production facilities one in Tuzla, Istanbul and one in Tarsus, Mersin. They have a production capacity total of 900,000 tonnes.
- The company had a revenue of USD 5.3 billion globally in 2012.
- The firm offers a wide range of products and services in Turkey including cement technology, concrete production and maintenance, floor covering, grouts and anchors, injection, insulation and bonding.

"Currently, as a regional power, Sika Turkey is in the top 10 producers of construction chemicals among the 80 countries that we serve, in terms of its production capacity, research and development, turnover, customer portfolio and distribution power."

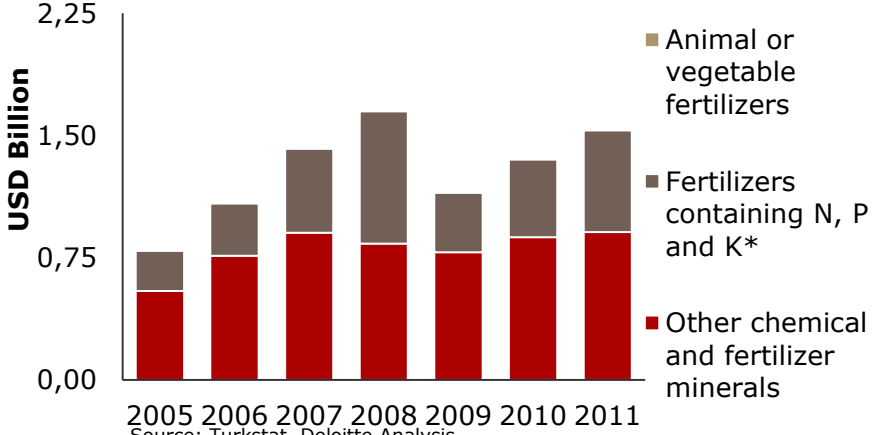
Manager of marketing and Technical services, Turgay Özkun

Source: Sika

The Fertilizer Sector:

Production value grew at an impressive double digit CAGR of almost 12% between 2005 and 2011.

Figure 18: The Production Value of Turkey's Fertilizer Sector

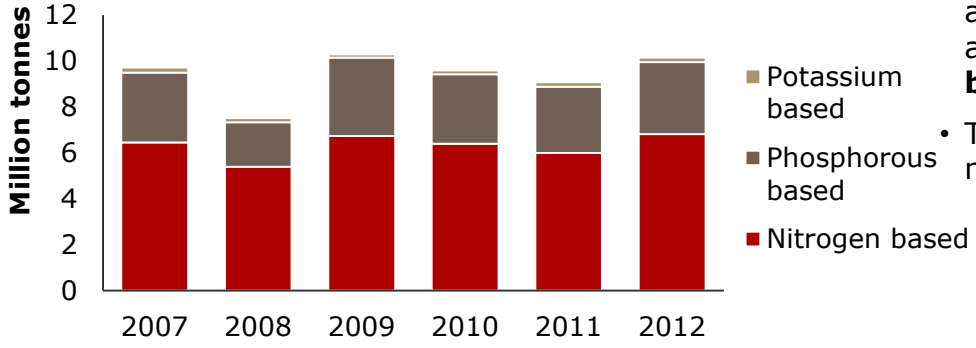


Source: Turkstat, Deloitte Analysis

*Nitrogen, phosphorus and potassium

Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

Figure 19: Turkey's Consumption Volume



Source: Ministry of Agricultural and Rural Affairs, Turkstat

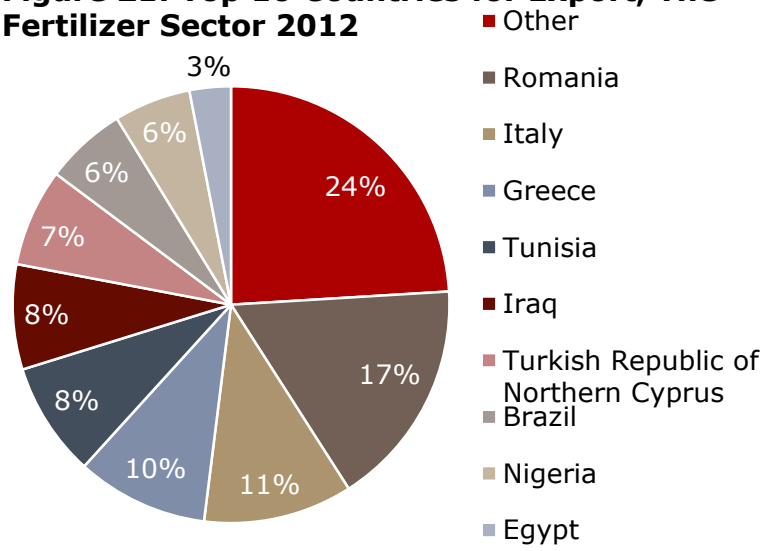
- The agricultural sector has always been vitally important to Turkey's economic well being since it constitutes 8.4% of the GDP and 10.7% of total exports as of 2012. As a result, the fertilizer industry has been relied upon to maintain productivity, which plays a crucial role in the success of the national economy. Total agriculture, hunting and forestry GDP, in constant prices, has increased almost CAGR 2% from 2005 to 2012.
- Turkey produces intermediate goods as well as compound fertilizers.
- Turkey's fertilizer industry has been on a high growth trajectory. Its production value greatly increased from 2007 to 2008 by 16% reaching USD 1.6 billion and the industry bounced back after the global economic downturn, exceeding pre-crisis levels by the year 2011. The industry grew by an accelerated growth rate of 17.7% between 2010 and 2011, reaching a production value of **USD 1.5 billion in 2011**.
- Total fertilizer consumption grew slightly from 9 million tonnes in 2007 to 10 million tonnes in 2012.

The Fertilizer Sector:

The fertilizer industry's high import rates indicate the high level of activity within the agricultural industry.

Figure 20: Turkey's Foreign Trade Statistics, The Fertilizer Sector

Figure 21: Top 10 Countries for Export, The Fertilizer Sector 2012



Source: Turkstat, Deloitte Analysis

Note: HS code 31 was used in the analysis.

- The top countries for imports within the fertilizer industry in 2012 include: Ukraine (21%), Russia (21%), Romania (15%), Lithuania (6%) and Tunisia (5%). Import values reached **USD 1.4 billion in 2012**.
- Turkey's main export partners in this sector are diverse and include: Romania (17%), Italy (11%), Greece (10%), Tunisia (8.5%) and Iraq (8%). Despite its distance from Turkey, Brazil is on the list of top fertilizer export countries with a 6% export share. Export values bounced back from a decline in 2009 and increased by triple digits to 148% creating a value of USD 204.5 million from 2009 to 2010 and then decreased to **USD 146 million in 2012**.

The Fertilizer Sector:
Selected Players

Gemlik Gübre Sanayi

- The company was established in 1973 as a subsidiary of Azot Sanayii T.A.Ş. Gemlik Gübre Sanayi then joined Yıldırım Holding in 2004.
- Their headquarters are located in Bursa.
- The company provides port service used for import-export shipments of fertilizer and ammonia.

Net Sales 2012:
USD 295 million

Istanbul Gübre Sanayi A.Ş

- İGSAŞ has 226 employees and its head office is in Kocaeli.
- The company has adopted national and European Union standards regarding the production of ammonia and urea fertilizers as well as composed fertilizers.
- IGSAŞ aims to produce qualified and customized products and services.

Net Sales 2012:
USD 269 million

Gübre Fabrikaları T.A.Ş

- Gübre Fabrikaları was established in 1953 and currently operates 2 facilities, in Iskenderun and Yarımca, with a total annual production capacity of 890,000 tonnes.
- Their headquarters are located in Istanbul.
- The company is the first Turkish producer of phosphoresce and compound fertilizers.
- It had 29% of the total market share by 2010.

Revenue in 2012:
USD 214 million

Bandırma Gübre Fabrikaları

- BAGFAŞ was founded in 1968 with the support and participation of local farmers and businessmen.
- The headquarters of the company are located in Istanbul.
- BAGFAŞ has two granulation facilities that produce various compound fertilizers with a capacity of 575 tonnes for compound fertilizers and DAP, respectively per day.

Revenue in 2012:
USD 204 million

Source: ISO 500 2012, Gemlik Gübre, İgsaş, Gübretaş, Bandırma Gübre, Emerging Markets Insight
Note: Gemlik Gübre, Igfaş, Gübretaş and Bagfaş's annual revenues were converted to USD based on year end FX rates.

A Success Story: Bayer CropScience

- Bayer CropScience is one of the leading companies providing crop protection solutions. Its products include insecticides, fungicides and herbicides.
- With operations in more than 120 countries, and 20,700 employees globally, Bayer CropScience increased its sales by 15.5% in 2012 to USD 11 billion*. In Turkey, sales reached USD 23 million**.
- Even though Bayer CropScience was formed through a merger between Bayer Crop Protection and Aventis CropScience in 2002, the Bayer group has been producing crop protection products in Turkey since 1965.
- The Turkish production facility, which started its operations in 1965 in Gebze, currently manufactures more than 60 kinds of crop protection products. In addition, the facility also includes a quality control laboratory, and a distribution center.
- The company started the Farmer's Club program in cooperation with Vodafone, which provides information to farmers about modern crop protection techniques through the use of Vodafone's mobile telecommunications web. The project has, so far, increased efficiency within the agriculture industry worth USD 137.7 million***.

"Turkey has a rapidly growing and increasingly stable economy with a rising population…the rising population will require additional food supplies. This will provide further opportunities for the growth of our CropScience subgroup, having been a long-time supporter of the Turkish agricultural sector."

Bayer Türk CEO , Dr. Axel Hamann

Bayer CropScience TÜRKİYE

Source: Bayer CropScience, Bayer, The Coordination Council for the Improvement of Investment Environment, Emerging Markets Insight

*Converted using 2011 year-end USD/EUR exchange rate of 1.3193
** Converted using 2011 year-end USD/TL exchange rate of 1.8889
***Converted using 2013 year-end USD/EUR exchange rate of 1.3774

The Detergent, Cosmetics and Personal Care Sector:
The sector's production increased at a CAGR of 19% between 2005 and 2011.

Figure 22: Turkey's Production Value for the Detergent, Cosmetics and Personal Care Sector

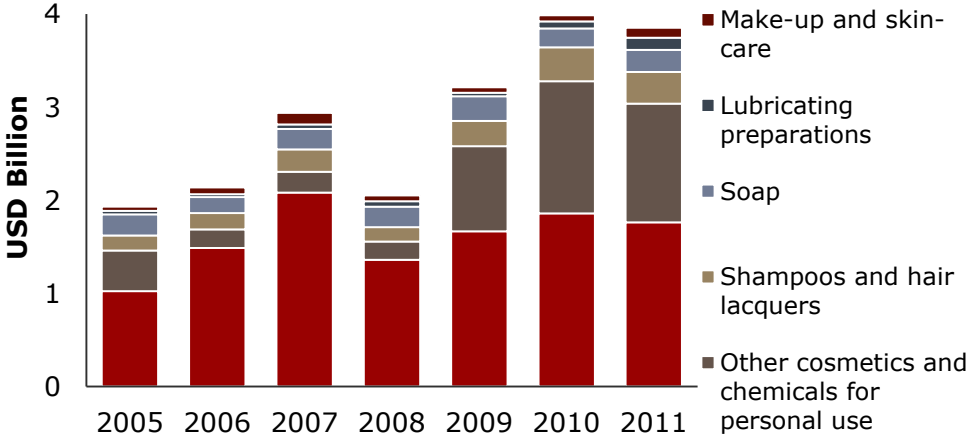


Table 4: Volume of Production (Thousand Tonnes)

Sub-Sectors	2007	2008	2009	2010	2011
Soap	143	168	169	170	197
Detergent	1376	1153	1279	1343	1423
Nail Polish and Hand/Body Creams	8.7	5.8	12.5	14.6	16.9
Perfume and Toilet Water (000' liters)	15.2	12.2	12.8	15.2	24.9

Source: Turkstat, Deloitte Analysis

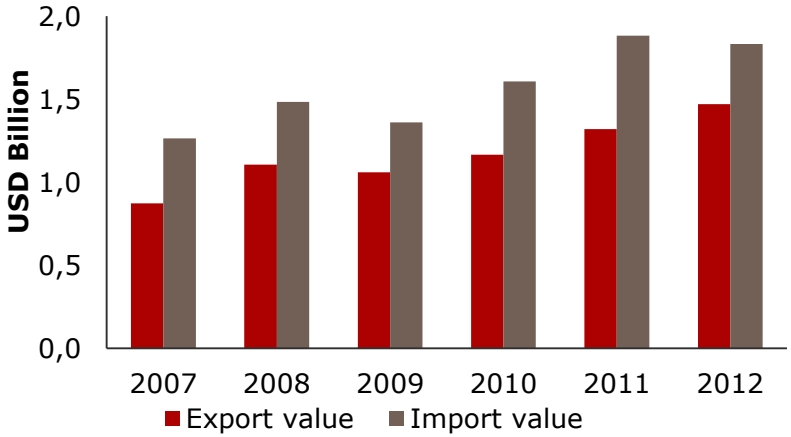
Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

- According to EMI's Report for Turkey's Chemicals Sector 2013, per capita spending on cosmetics **in Turkey stands at USD 36***, compared to USD 235* in Norway, USD 258* in Denmark and USD 231* in Austria. Thus, are opportunities and significant room for growth for this sector in Turkey.
- The Turkish detergent and cosmetics industry has been growing at a relatively fast pace. The impact of the 2009 recession proved to be short lived as the industry recovered reaching USD 4 billion in 2010 and even surpassing its pre-crisis levels.
- The industry reached a **USD 3.9 billion production value in 2011.** The CAGR for the six-year period of 2005-2011 equates to **12%**.
- The production volume of detergents reached **1.4 million tonnes in 2011**.
- According to the Ministry of Economy, the industry **employed approximately 12,000 people**, directly and indirectly, nationwide in 2012.

* Converted using 2013 year-end EUR/USD rate of 1.3774.

The Detergent, Cosmetics and Personal Care Sector:
The sector's exports reached USD 1.47 billion in 2012 and were concentrated in the Middle Eastern and Eastern European markets.

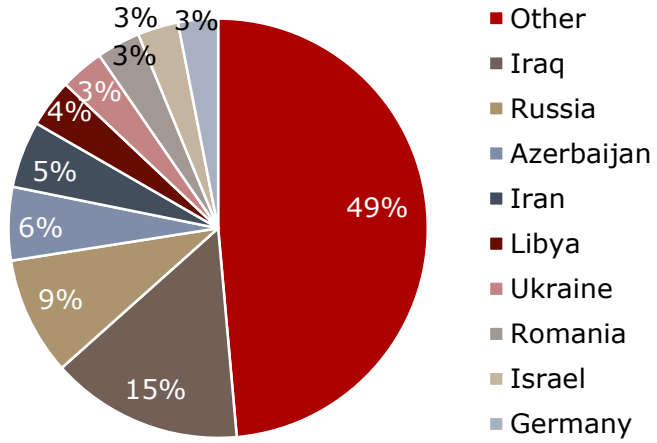
Figure 23: Foreign Trade in the Detergent, Cosmetics and Personal Care Sector



Source: Turkstat, Deloitte Analysis

Note: HS code 33 and 34 were used in the analysis.

Figure 24: Top 10 Countries of Export, The Personal Care Sector 2012



- Turkish detergent, cosmetics and personal care **exports reached USD 1.47 billion in 2012** with a **CAGR of 11%,** while the number of export markets reached **156**. These were achieved by recent modernization and technological improvements in production, management and distribution. The top export markets for the industry include Iraq (15%), Russia (9%), Azerbaijan (6%) and Iran (5%). Other significant export markets consist largely of Eastern European and Middle Eastern countries.
- **Import values reached USD 1.83 billion in 2012**, slightly decreasing compared to the previous year's value. Import values have been growing much like exports and have increased over the years with a **CAGR of 8%**. Top import countries include Germany (20%), France (13%), Poland (7%), Ireland (6.6%) and Italy (6.6%).
- According to the Ministry of Economy, in 2012 there were about **750 companies** in the industry with the majority of producers located in Istanbul, the largest production and trade center in Turkey. Most of the other manufacturers were located in Izmir, Kocaeli, Gaziantep, Mersin and Adana.

The Detergent, Cosmetics and Personal Care Sector:
Selected Players

Unilever

- Unilever, one of the world's leading suppliers of consumer goods, was founded in 1951.
- The company has 5,086 employees in Turkey and its headquarters are located in Istanbul.
- Unilever takes an active role in its R&D facilities with a budget of approximately EUR 1 billion per annum.

Revenue in 2012: USD 1.5 billion

Hayat Kimya Sanayi

- Hayat Kimya's headquarters are located in Istanbul.
- The company has invested in manufacturing as well as technological infrastructure support, permanent process control and maintains an environmentally-friendly approach.
- It manufactures household cleaning products, feminine hygiene products and personal care products in its Izmit -Yeniköy Integrated Manufacturing Facilities.

Net Sales 2012: USD 623 million

P&G

- P&G has entered the Turkish market in 1987.
- P&G produces and distributes powder detergent, diapers, sanitary napkins and bleach.
- P&G Turkey is the 3rd among the 52 countries in which the company operates in Middle and Eastern Europe, Middle East and Africa. In addition P&G Turkey is the 13th among the P&G Global Subcompanies.
- P&G has invested in Turkey for USD 550 million since 1987 .

Revenue in 2012*: USD 84.2 billion

Henkel

- Henkel has been operating in Turkey since 1963.
- Henkel Turkey continues its activities in the home care, personal care and adhesives businesses with its 3 production facilities in Tuzla, Gebze and Ankara.
- Henkel Turkey invested USD 68 million in last 5 years.
- Henkel wants to increase its sales in developing markets to USD 13 billion which gives Turkey a critical role.

Revenue in 2012: USD 552 million

Source: ISO 500 2012, Unilever, Hayat Kimya A.Ş, Emerging Markets Insight
* Global Revenue

A Success Story: Unilever

"Turkey has great potential. Turkey will play a key role as a bridge between the East and the West. Our production in Turkey is export-oriented, by multiplying these investments, we want to help Turkey's economy to reduce the current account deficit.
Turkey's youthful population, growing economy and increasing export market make the country very competitive on the global scene. I estimate that Turkey's aim of becoming one of the world's top 10 economies is an ambitious, but attainable target.
I value our investment in the Turkish people, including farmers and suppliers more than investment in production and facilities. I think they will increase Turkey's competitiveness."

CEO of Unilever, Paul Polson

- Unilever, one of the world's leading suppliers of consumer goods, entered the Turkish market in 1952 by establishing the SANA margarine factory.
- Today, the company has 5,086 employees in Turkey and its headquarters are located in Istanbul. Unilever provides revenue for more than 15,000 people in the Black Sea region thanks to its tea production subsidiary.
- Unilever allocates USD 1,391 billion* per annum to R&D, globally. Unilever has 120 employees working in their R&D center in Turkey.
- Unilever has 8 factories across Turkey including one ice cream factory located in Konya. Their products are exported to 36 countries in the EMEA region.
- The company's revenue in 2012 was more than USD 1.5 billion.

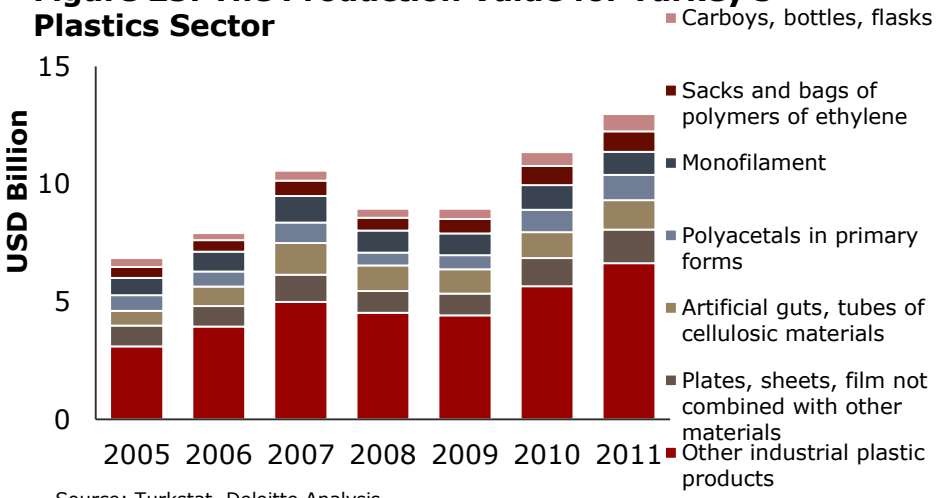
Source: Unilever, Emerging Markets Insights

*Converted using 2012 year end EUR/USD FX rate of 1.3193

The Plastics Sector:

The sector's production value tripled between 2005 and 2011 as demand for the product grew.

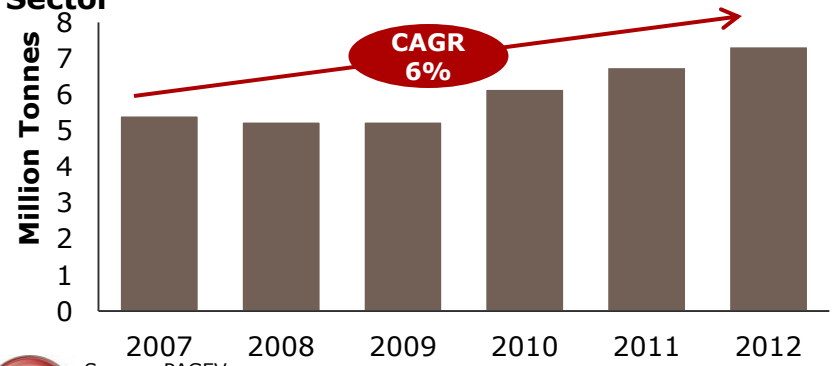
Figure 25: The Production Value for Turkey's Plastics Sector



Source: Turkstat, Deloitte Analysis

Note: Year -end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

Figure 26: Production Volume of Turkey's Plastics Sector



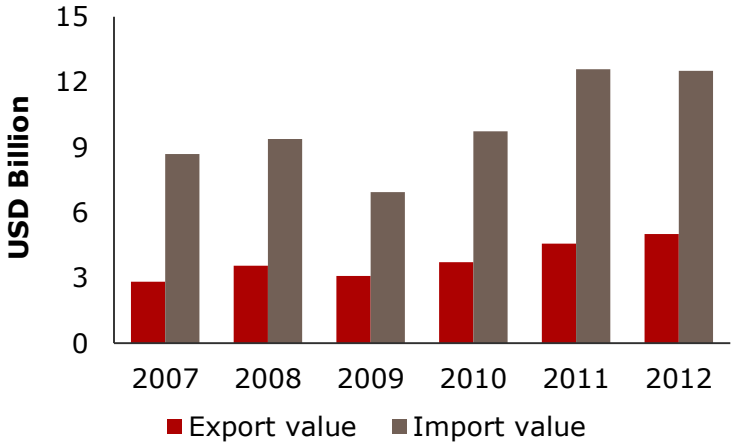
Source: PAGEV

- Despite being a relatively young sector, Turkey's plastics sector uses the latest technology, developments and designs. Most finished plastic products comply with regulations of the Turkish Standards Institute (TSE), International Standards and with the standards set by the EU.
- Plastics production has recovered and growth has accelerated, reaching **USD 13 billion in 2011**. The CAGR of the past six years exceeded **11%** and the sector has nearly tripled in terms of value.
- Turkish plastics production volume increased by a CAGR of 6% during 2007 to 2012 and surpassed 7.3 million tonnes.
- The capacity utilization rate of the sector was 72.1% in 2012. Parallel to the high capacity utilization rate, companies in the industry started to invest in high tech machinery. According to PLASFED, the total machinery investment in the sector increased a stunning CAGR 11.7% from 2003 to 2012, amounting to a total investment of USD 785 million in 2012.

Source: PAGEV, PLASFED

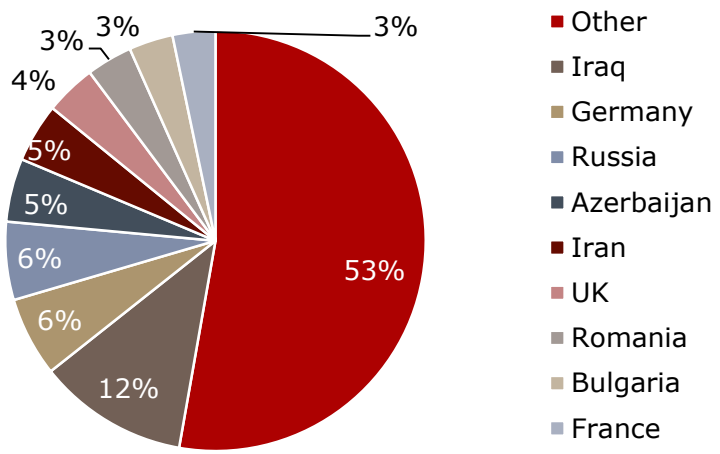
The Plastics Sector:
Exports exceeded USD 5 billion in 2012 with double digit growth since 2009.

Figure 27: Foreign Trade for the Plastics Sector



Source: Turkstat, Deloitte Analysis
Note: HS Code 39 was used in the analysis.

Figure 28: Top 10 Countries for Export, The Plastics Sector, 2012



Source: Turkstat, Deloitte Analysis

- Exports grew by 20% and 23% in 2010 and 2011, respectively, reaching USD 4.6 billion in 2011. The recent slowdown in the growth of developing countries has cooled the industry. **Export values reached USD 5 billion in 2012**, with a **CAGR of 12%** since 2007. The largest export markets in 2012 were Iraq (12%), Germany (6%), Russia (6%) and Azerbaijan (5%). Other notable export markets were mainly EU countries, the former Soviet states, Eastern European countries and Middle Eastern countries.
- The **import values** of the plastics industry increased with a **CAGR of 21.7%** in the past three years, reaching a value of **USD 12.5 billion in 2012** after experiencing a standstill in 2011. The largest import countries as of 2012 were Saudi Arabia (13%), Germany (12%), Belgium (6%) and China (6%).
- Moreover, Turkey was ranked as the 5th largest exporter of plastic pipes in the world with a share of 4% of total plastic pipes exports in 2012.

Source: ITC

The Plastics Sector:
Selected Players

Pakpen Plastik

- Pakpen Plastik was founded in 1989.
- Their headquarters are located in Konya.
- The company uses the latest technology in its 300,000 square meter facilities.
- Pakpen Plastik laboratories are accredited by the Turkish Accreditation Agency (TÜRKAK) and have their certificate.

Net Sales 2012: USD 235 million

Polinas Plastik

- Polinas Plastik was founded in 1982.
- Polinas's factory is located in the Manisa Organized Industry Zone.
- Their headquarters are in Istanbul.
- Polinas is a global biaxially oriented polypropylene film producer with a capacity of 100,000 tonnes. It continuously invests in qualified manpower and state of the art technology.

Net Sales 2012: USD 186 million

Polyplex Europa

- Polyplex Europa was founded in 2004 .They are headquartered in Tekirdağ. The company manufactures PET and metallized film.
- The factory in Çorlu has a capacity of 58,000 tonnes per year.
- Polyplex produces 210,000 tonnes of bottle-grade PET resin per year.
- In September 2013, PE incorporated a 100% owned distribution subsidiary in Turkey to facilitate better market reach in Turkish market.

Net Sales 2012: USD 112 million

Köksan Pet ve Plastik Ambalaj

- Köksan was founded in 1968.
- The headquarters are located in Gaziantep.
- Köksan manufactures its products in their 145,000 square meters production facilities in Gaziantep and Manisa.
- The company has a production capacity of USD 200 million for plastic bottle production and also an export volume of USD 10 million per annum.

Net Sales in 2012: USD 176 million

Source: ISO 500 2012, Pakpen, Polinas, Polyplex, Köksan, Emerging Marketsi Insight
Note: Polinas and Köksan Plastik's revenues were converted using year end exchanges rate of 1.7776

Success Story: Wavin Pilsa

"The acquisition of Pilsa provides Wavin with an excellent opportunity to benefit from the positive economic developments in Turkey and surrounding countries. The emerging markets of Europe continue to outperform Western Europe, albeit at a considerably lower pace than the exceptional growth record last year. In some of these countries, we are experiencing margin pressure from dollar-denominated competition. In Turkey, Wavin's recent acquisition of Pilsa Plastic is delivering revenue and margin levels ahead of expectations."

CEO of Wavin, Philip Houben

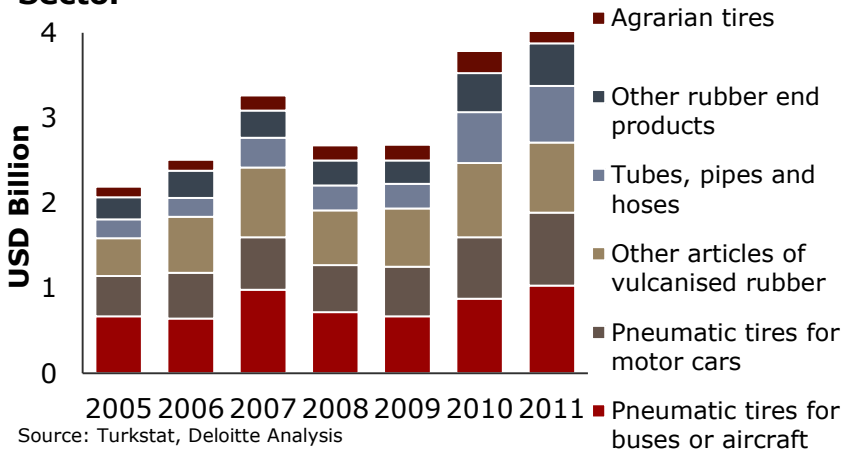
Source: Wavin

- Wavin is the leading supplier of plastic pipe systems and solutions in Europe. Occupying the either the first or second position in more than half the countries in which it operates, Wavin serves its clients in Europe through sales and distributions centers in 25 countries. In addition, it has 40 manufacturing sites located throughout Europe.
- Founded in 1955, 50% of Wavin's shares were acquired by Royal Dutch Shell in 1962. It has 6,200 employees globally and a revenue of USD 1.75 billion* in 2011.
- In 2007, Wavin acquired Pilsa Plastic, a prominent Turkish manufacturer of pipes and fittings from Sabancı Group for USD 125 million. According to the ISO 500 2012 list, Wavin TR Plastik Sanayi A.Ş ranked as the 450th biggest company in Turkey with a total sales of USD 105 million.
- At the time of the acquisition, Pilsa had a factory located in Adana with 390 employees. The company was a significant player in its home market and had strong export businesses in several Central and Eastern European countries.
- Wavin Pilsa is one of the top 500 industrial companies of Turkey. Wavin describes Turkey as a key growth market in its 2011 Annual Report and has plans to increase its market share until 2015 through its investments.

*Converted using 2011 year-end USD/EUR exchange rate of 1.3193.
**Converted using 2012 year-end USD/TL exchange rate of 1.7776.

The Rubber Sector:
Rubber production doubled from 2009 to 2011, reaching USD 8 billion.

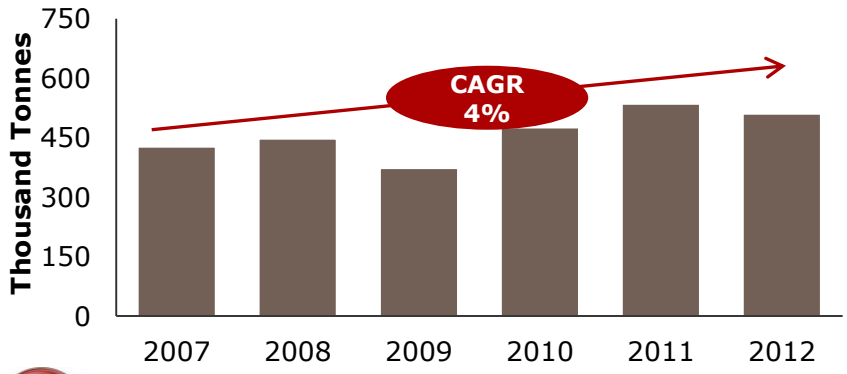
Figure 29: Production Value of Turkey's Rubber Sector



Source: Turkstat, Deloitte Analysis

Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

Figure 30: Production Volume of Turkey's Rubber Sector



Source: PAGEV

- Turkey is **the largest light commercial vehicle manufacturer in Europe** and it expects to become the **third largest auto manufacturer in Europe by 2015**. This means the automotive industry in Turkey will continue to demand large amounts of rubber.
- The sector experienced impressive growth rates between 2005 and 2011 in terms of value, surpassing USD 4.2 billion in 2011, which demonstrates a CAGR 11% increase between 2005 and 2011.
- The production volume of the rubber sub-sector reached 510,000 tonnes in 2012, growing at a CAGR of 4% between 2007 and 2012. The increase in production can be attributed to the increasing use of rubber especially in the automotive sector. According to PLASFED, the total amount of rubber used in vehicles increased at a CAGR of 4.2% from 2005 to 2012. Currently, a vehicle on average is 6% rubber.

Rubber Sector:
Exports reached USD 2.42 billion in 2012.

Figure 31: Turkey's Foreign Trade Statistics, The Rubber Sector

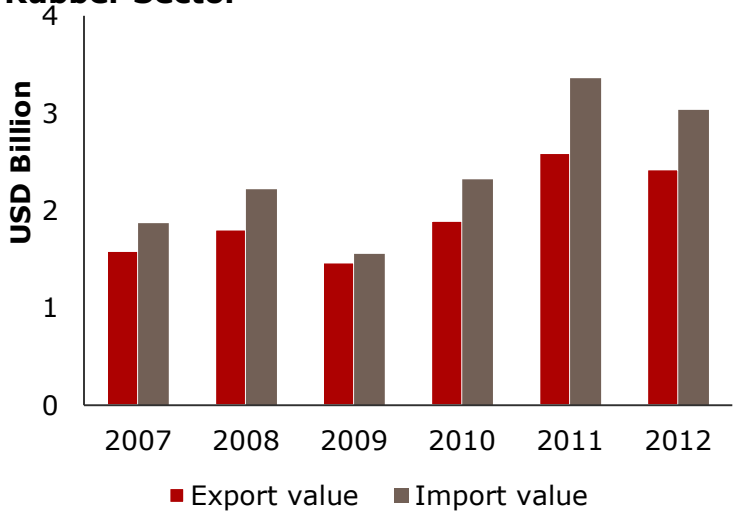
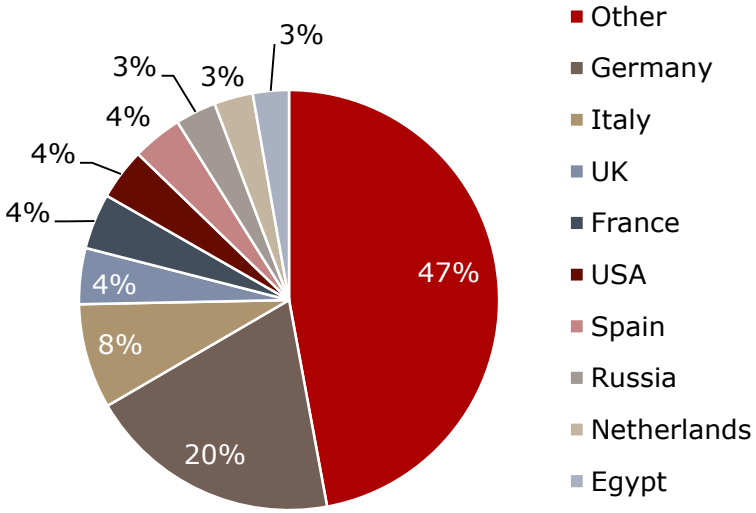


Figure 32: Top 10 Countries for Exports, Rubber Sector 2012



Source: Turkstat, Deloitte Analysis

Note: HS code 40 was used in the analysis.

- **The sector's exports** were recovering from the global crisis in 2009. In 2012, it reached a total of **USD 2.42 billion**. The main export markets are mainly EU countries with Germany (19.5%), Italy (8%), the UK (4%) and France (4%). Turkey has also been able to export to other countries including the USA (4%) and Russia (3%).
- The **import values** paralleled the fluctuations of export values and reached **USD 3 billion in 2012**. Notable import markets of 2012 include Germany (10%), Indonesia (7.5%), Italy (7%), South Korea (6.6%) and Thailand (6%).
- Most of the main rubber producers have chosen the Marmara region in order to be close to raw material sources and the supply and demand markets of Istanbul and Bursa. International players such as Pirelli and Goodyear opened production facilities in Turkey and constitute an important portion of the sales market.

The Rubber Sector:
Selected Players

Brisa

- Lassa was originally established by the Sabancı Group in 1974.
- Lassa entered into a joint venture shareholder with the Bridgestone Corporation of Japan in 1988. It was renamed as Brisa after the venture.
- The company has a 196,000 m^2 factory and is equipped with state-of-the-art technology.
- Brisa is the market leader in Turkey and 7th largest tire producer in Europe.

Revenue in 2012: USD 801 million

Pirelli Lastik

- Pirelli Lastik was founded in 1960 in Turkey.
- The Pirelli factory is located in Izmit, while its headquarters are in Istanbul. The production capacity of the factory is 8 million tires per year.
- The company employs more than 1,700 people.
- Pirelli attaches importance to research and development facilities basing its strategy on 'Green Performance'.

Revenue in 2012: USD 669 million

Goodyear Lastik

- Goodyear Lastik T.A.Ş was founded in 1961.
- The Goodyear factories are located in Adapazarı and Izmit and employ more than 1,300 people.
- 25.4% of Goodyear shares are open to public, while 74.6% of the shares is owned by Goodyear S.A as of 31.12.2012.

Revenue in 2012: USD 639 million

Petlas Lastik

- Petlas Lastik was founded in 1976. The company produces tires for land vehicles and aircraft in its factory of 250,000 square meters.
- Petlas is the 113th biggest industrial enterprise in Turkey, in 2012.
- Japanese Sumitomo Rubber manufacturing company is investing USD 516 million with Petlas to jointly establish a rubber production facility.

Revenue in 2012: USD 357 million

Source: ISO 500 2012, Brisa, Pirelli, Goodyear, Petlas, Emerginf Markets Insights
Note: Note: 2012 year end exchange rate of 1.7776 was used to convert TL to USD

Success Story: Goodyear

- Goodyear is one of the largest producers of rubber tires globally with a presence on six continents and global sales of more than USD 15 billion.
- With its more than 72,000 employees, Goodyear operates 52 production facilities in 22 countries, and sells its goods in 185 countries. Additionally, it spends USD 400 million annually for its R&D activities.
- Goodyear has been active in Turkey since 1961 and currently has two production facilities located in Izmit and Adapazarı. With more than 1,300 employees in Turkey, Goodyear Turkey had a revenue of USD 639 million* in 2012.
- Goodyear has made investments totaling more than USD 190 million in Turkey within the last 15 years.

"Turkey has a young population and a rapidly growing economy. We would be delighted if Turkey would start manufacturing its own brand of automobiles and we would increase our investments accordingly."

The Goodyear Tire & Rubber Company, Europe, Middle East & Africa Business Vice-President, Michel Rzonzef

Source: Goodyear, Milliyet

*Converted using 2012 year end TL/USD exchange rate of 1.7776

The Inorganic Chemicals Sector:

Production equaled USD 2.3 billion in 2011, growing a staggering 33% compared to the previous year.

Figure 33: Production Value of Turkey's Inorganic Chemicals Sector

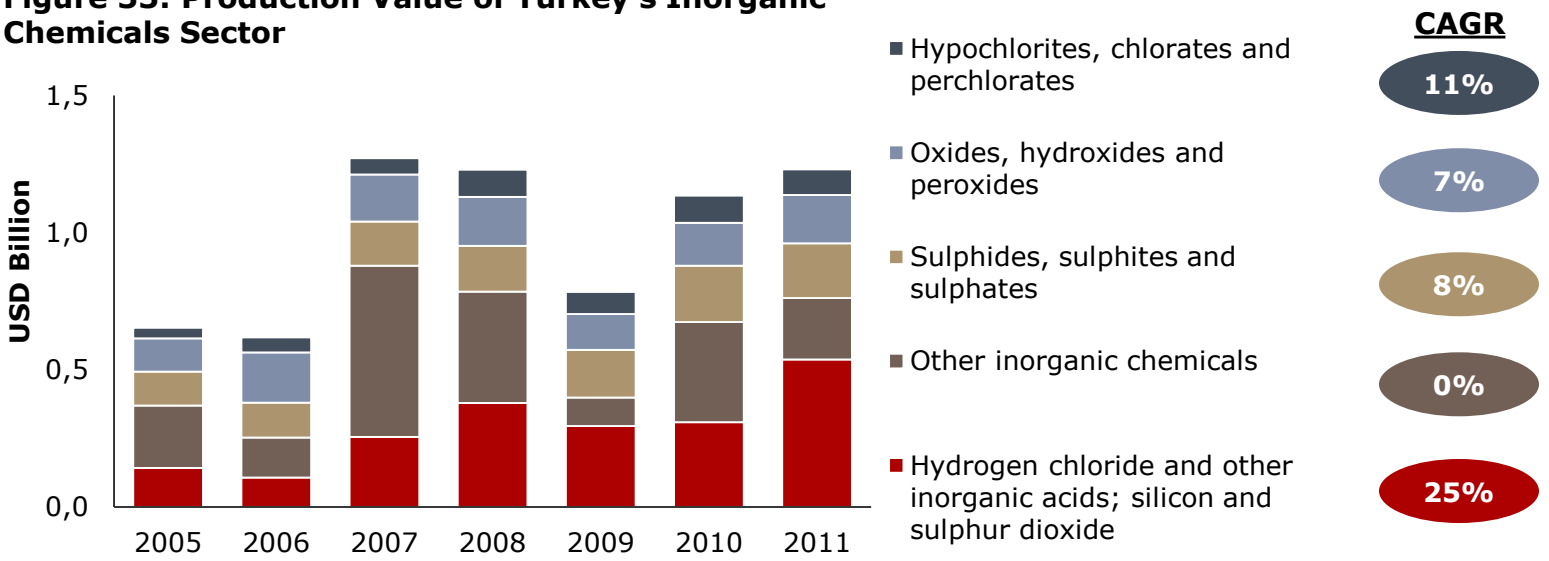


Table 5: Volume of Production (Thousand Tonnes)

Sub-Sectors	2007	2008	2009	2010	2011
Hypochlorites, Chlorates and Perchlorates	196	252	228	314	347
Inorganic Oxygen Compounds of Non-Metals	162	114	95	106	105
Metal Oxides, Peroxides and Hydroxides	3.98	(*)	3.95	4.75	6.87

- The production value of the industry reached **USD 1.2 billion in 2011** with a CAGR 11% growth rate between 2005 and 2011.
- The production volume increased more than 8% in 2011 from the previous period, surpassing **458,000 tonnes**. The total volume of production also increased **CAGR 6%** from 2007 to 2011.

Source: Turkstat, Deloitte Analysis
(*): not disclosed by Turkstat
Note: Year-end exchange rates were used to convert TL to USD 2006 (1.4056), 2007 (1.1593), 2008 (1.5213), 2009 (1.4873), 2010 (1.5376), 2011 (1.8889).

The Inorganic Chemicals Sector:

Exports are on a positive growth trajectory and reached USD 1.3 billion in 2012.

Figure 34: Foreign Trade for the Inorganic Chemicals Sector

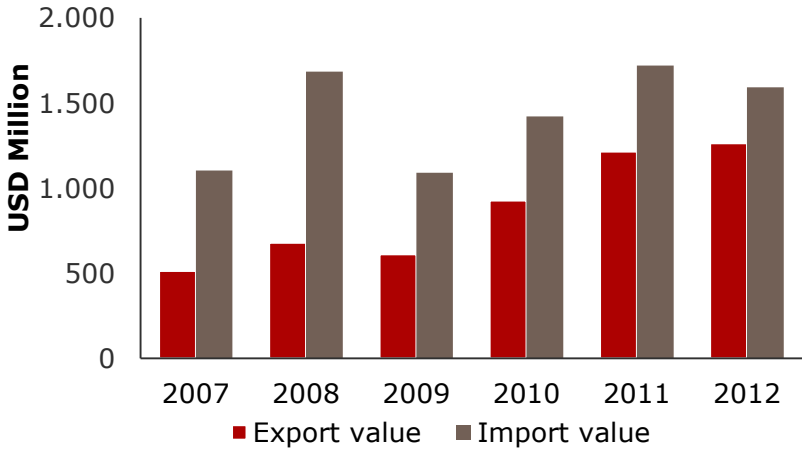
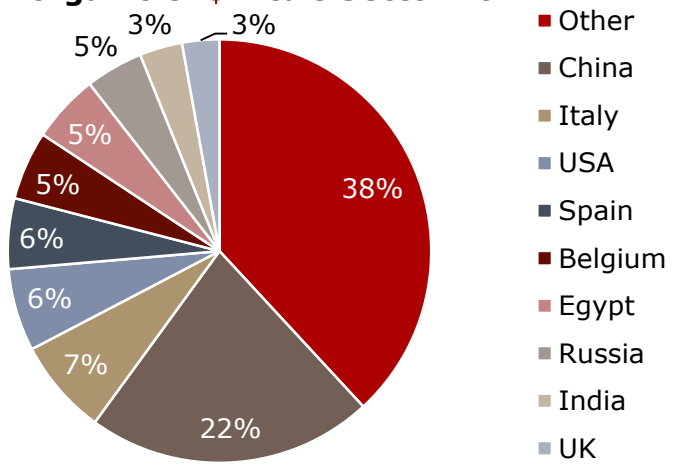


Figure 35: Top 10 Countries for Export, The Inorganic Chemicals Sector 2012



Source: Turkstat, Deloitte Analysis

Note: HS 28 code was used in the analysis.

- **Export values** were equal to USD 600 million in 2008 and today have nearly doubled. Despite slightly shrinking exports in the 2009 economic downturn, the sector's exports grew at a CAGR of 27% in the following years reaching **USD 1.26 billion in 2012**. Turkey's largest export markets are China (22%), Italy (7%), the USA (6%) and Spain (5%).
- After experiencing a sharp decline in 2009, import values have greatly increased, reaching **USD 1.5 billion in 2012** growing at a **CAGR of 13%** since 2009. As of 2012, the largest import markets are Russia (14%), Egypt (10%), China (9.6%) and Germany (9.3%).
- Chemical facilities are concentrated in the Marmara and Aegean regions because of their proximity to both low cost transportation routes such as ports and demand markets in need of manufactured goods. The facilities in the Marmara region are mostly around Istanbul and close to industrial zones.

The Inorganic Chemicals Sector:
Selected Players

ACH Inorganic Chemicals

- ACH was founded in 2007 to produce Polyaluminum Chloride Hydroxide Sulphate.
- The production facilities of the company is located in Bursa and is the first producer of the product in Turkey.
- Through the KOSGEB R&D innovation program support, the company conducts research in non-flammable chemicals and descaling chemicals.

Revenue in 2012:
N/A

Akdeniz Kimya

- Akdeniz Kimya A.Ş. was incorporated in Izmir in 1976.
- The company is one of the world's leading and most trusted producers of PVC additives and specialty chemicals such as metallic soaps, several basic stabilizing components, lubricants, beta diketones, hydrotalcite and acrylic-based processing aids and impact modifiers.
- The company has an end product capacity of more than 250,000 tonnes/year and employs over 500 people with sales to more than 90 countries in the world.

Revenue in 2012:
~USD 200 million*

Source: ISO 500 2012, Akdeniz Kimya
- Akdeniz Kimya does not have financial statements that are open to public but thier web site indicates a revenue reaching USD 200 million.

A Success Story: 3M

- Founded in 1902, 3M is a global company with operations in more than 70 countries. Its global sales reaching USD 30 billion in 2013, 3M has 88,000 employees.
- Active in a number of different sectors such as automotive, healthcare, chemicals and consumer goods, 3M produces a wide range of products including paint and coatings, adhesives, abrasives and non-woven materials.
- 3M commenced its operations in Turkey in 1987. In 1992, it started manufacturing goods in Turkey which supply not only the domestic market, but are also exported to nearly 40 countries.
- In 2012, encouraged by Turkey's steady economic growth and the new government incentive plan, 3M decided to establish a regional production center in Çorlu, Turkey.
- This "Super Hub", which will be the third of its kind in Europe, will require an investment of USD 500 million just for its construction. However, its economic impact will undoubtedly be larger as it will employ at least 1,000 qualified workers.

"The decision to make a large investment in Turkey runs parallel to our growth targets in the region. In addition to expanding 3M within Turkey, this will also be a critical step in supporting our growth in Western and Eastern Europe. Production in Turkey will serve the Middle East and North African regions as well."

3M Vice President for Central and Eastern Europe, Giuseppe Castaldi

Source: 3M, ISPAT

A Success Story: Polyplex

- Founded in 1987, Polyplex Corporation is among the world's largest manufacturers of thin PET film. It also produces thick PET film and has a number of integrated downstream capabilities including metallizing, silicone coating and extrusion coating.
- Polyplex commenced its activities in Turkey in 2005. Since then, it has increased its production capacity consistently.
- In 2012, Polyplex upgraded its facilities in Turkey by launching a new production line in the Free-Trade Zone in Çorlu, Turkey. The facility in Çorlu has an installed capacity of 56,000 tonnes/annum for thin PET film, 11,000 tonnes/annum for metallized film, 57,600 tonnes/annum for PET resin and an offline chemical coating project with an annual capacity of 2,300 metric tonnes.
- The company has also announced plans to invest, in the short term, to set up a brownfield project for manufacturing bottle-grade PET resin with a planned capacity of 210,000 tonnes per annum.

"To focus and establish our market position in the European and Mediterranean markets, we took steps to establish a polyester film plant in Turkey, and in September 2004 we formed a company in Turkey; Polyplex Europa Polyester Film San. ve Tic. A.Ş. Ever since that decision we have been very content… Thanks to the location, we now have ready access to the large existing market in Western Europe, where no new capacity has been added in the past 3-4 years, notwithstanding continued growth in the market. This market also imports significant quantities."

Senior Vice President of Polyplex, Kapil Gupta

POLYPLEX

Source: Polyplex, Bloomberg, ISPAT

A Success Story: Aditya Birla Group

- The Aditya Birla Group, a Fortune 500 company worth USD 40 billion, has 136,000 employees globally in more than 40 different countries.
- A large conglomerate operating in a number of different sectors, the group is among the leading producers of metals, viscose staple fiber (VSF), cement as well as owning some of the most energy-efficient fertilizer plants in the world.
- In 2011, Aditya Birla Group announced an investment in Adana for a greenfield integrated viscose staple fiber plant which is planned to start operations in 2014. With this project, the group will invest a total of USD 510 million in five years, and will provide employment to 550 people.
- The planned viscose staple fiber plant in Adana will initially supply the domestic market. However, the group has plans to export 20% of production to neighboring countries.
- In 2012, the group announced that they are considering a second investment worth USD 500 million.

"Turkey, I believe is the 4th largest consumer of VSF in the world. It is expected to become the 2nd largest consumer over the next 5 years. So setting up the VSF manufacturing facility here makes immense sense. We used to export VSF to Turkey. Now, setting up a plant here will help us to cater to local demand and export to neighboring countries."

Aditya Birla Group Chairman, Kumar Mangalam Birla

ADITYA BIRLA GROUP
PREMIUM GLOBAL CONGLOMERATE

Source: Aditya Birla Group, The Times of India

A Success Story: DowAksa

- DowAksa was established in 2012 as a 50:50 joint venture between The Dow Chemical Company and Aksa Akrilik Kimya Sanayii A.Ş.
- Aksa Akrilik Kimya Sanayii A.Ş. is the world's biggest produced of acrylic fiber with a total capacity of 308,000 tonnes per year. This corresponds to a 14% share of the worldwide market. Aksa's turnover was USD 907 million in 2012 and has more than 3,200 employees.
- Dow had annual sales of approximately USD 57 billion and employed approximately 54,000 people worldwide.
- DowAksa produces carbon fiber and carbon fiber reinforced composite solutions for industrial applications in its production facility in Yalova, Turkey.

"Making Turkey the second biggest acrylic fiber market in the world with its leading position in technical fiber and production capacity in acrylic fiber, AKSA has achieved an important position in the international market with the carbon fiber.."

Akkök Grup Companies CEO and Aksa Board Chairman, Mehmet Ali Berkman

DOWAKSA

C. Competitiveness of Turkey's Chemicals Industry

i. Labor Force and Education

ii. Foreign Trade

iii. Infrastructure and Refineries

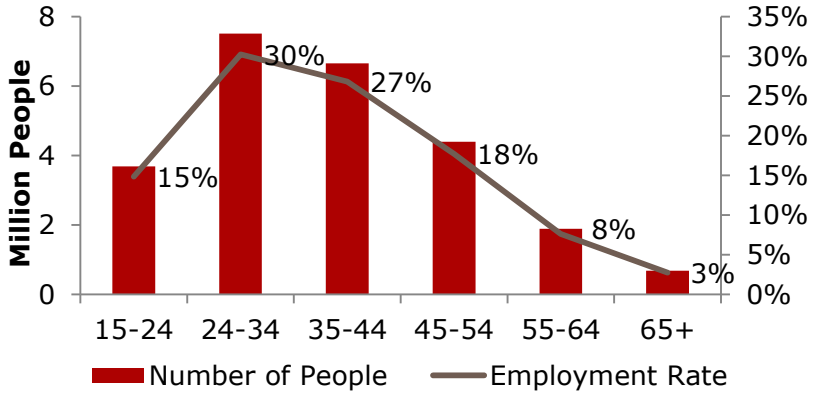
iv. TDZs, R&D Centers, OIZs and Patent Applications

v. Gross Profit Margins

vi. Ease of Doing Business in Turkey

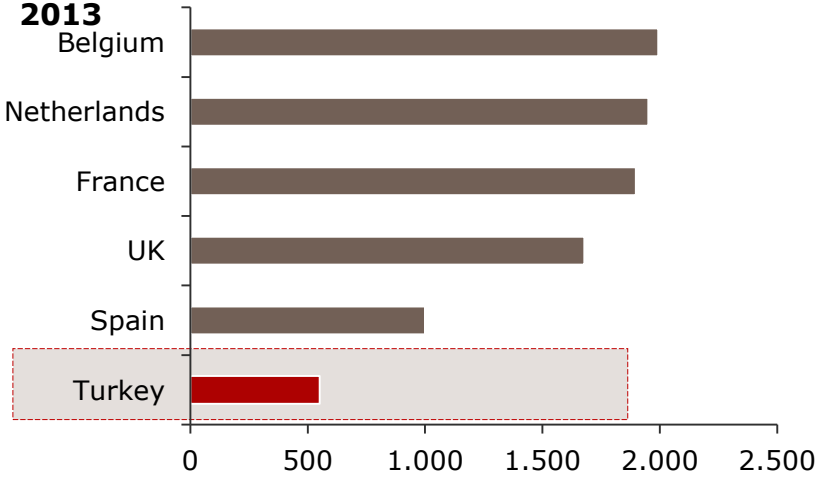
Turkey's human resources, a young and cost effective labor force, create a pillar for the industry.

Figure 36: Employed Population, 2012



Source: Euromonitor

Figure 37: Monthly Minimum Wage, October 2013



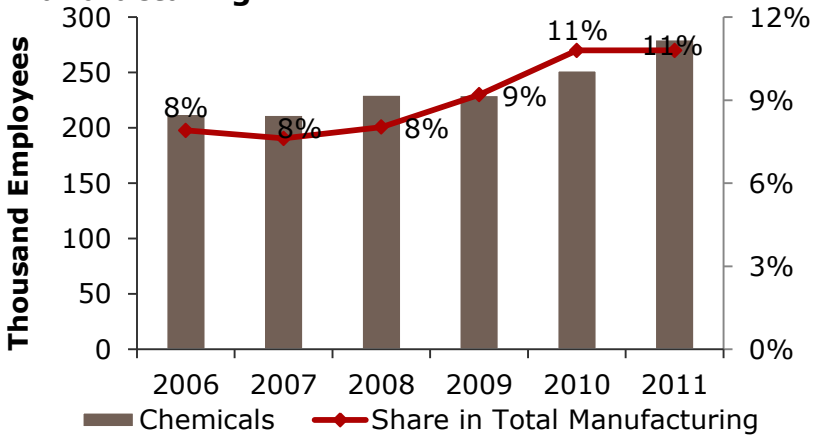
Source: Eurostat

Note: Converted using 31 October 2013 EUR/USD exchange rate of 1.3672.

- The workforce in Turkey is one of the **youngest and largest** in **Europe**. It has the necessary education, training, skills, technology and management experience required for growing the industry.
- **More than 65%** of the population is aged **between 24 and 54,** giving Turkey a huge advantage in this sector.
- Turkey has one of the lowest minimum wage rates in Europe coming in at USD 551 per month as of October 2013.

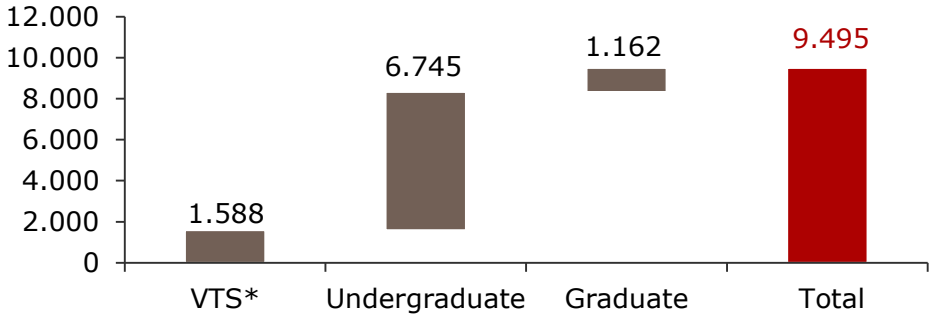
This is supported by 10,000 students graduating every year with a degree directly related to the chemicals industry.

Figure 38: Number of Workers in Chemical Manufacturing



Source: Ministry of Science, Industry and Technology, Turkstat, Deloitte Analysis
Nore: Nace Rev. 2 Codes: 20, 21, 22 were used.

Figure 39: The Number of Students Graduating from Chemical-Related Fields in 2012



Source: ÖSYM, Deloitte Analysis
* Vocational Training Schools

- According to the Ministry of Science, Industry and Technology, the total number of people employed in the chemical manufacturing industry rose approximately 20% from 2004 to 2009.
- In 2009, employment in the chemical manufacturing sector constituted about 9% of total employment with the manufacturing sector.
- Moreover, Turkey benefits from a highly skilled workforce that is trained specifically for the chemicals industry.
- There are departments in universities and vocational high schools tailored for education in chemistry and chemical manufacturing. These departments include chemistry, petrochemicals, chemical technologies, chemical engineering and the like.
- The total number of graduates, including all vocational training schools, undergraduate degree holders and graduates with advanced degrees surpassed 9,000 people in the 2011-2012 academic year.

Turkey's advantageous geographical position helped increase its total trade volume to more than USD 389 billion in 2012.

- Turkey's geographical location and logistical capabilities, its unique positioning at the intersection of trade routes and its rapidly progressing investment climate are major factors contributing to Turkey's strategic and regional importance. Turkey's easy access to 1.5 billion customers in Europe, Eurasia, the Middle East and North Africa allows it to create a link between three continents with a projected GDP of USD 25 trillion.
- To increase and promote trade, Turkey has 19 free trade zones, where export-oriented production is encouraged and no legal or administrative legislation is applied (or partially applied). Total trade volume in free zones exceeded USD 23 billion in 2012.
- Moreover, Turkey has taken crucial steps to increase its Free Trade Agreements all around the world. As of 2012, Turkey has FTAs with 19* countries. These countries include the European Free Trade Association (EFTA), Macedonia, Bosnia-Herzegovina, Albania, Israel, Palestine, Morocco, Tunisia, Egypt, Syria, Georgia, Serbia, Montenegro, Chile, Jordan, South Korea and Mauritius. The top countries that Turkey exported to in 2012 include Egypt with USD 3.7 billion, followed by the ETFA countries with USD 2.6 billion, Israel with USD 2.3 billion and Morocco with USD 1 billion.

Table 6: Turkey's Total Foreign Trade Volume in Chemicals Industry by Region, 2013

Region	Trade Volume (USD Billion)
Europe (EU-28)	29.4
Europe (Non-EU)	22.1
North America (NAFTA)	3.61
Central & South America	1.9
Africa, Caribbean and Pacific	1.2
Neighboring Countries	18.3
Total	**76.5**

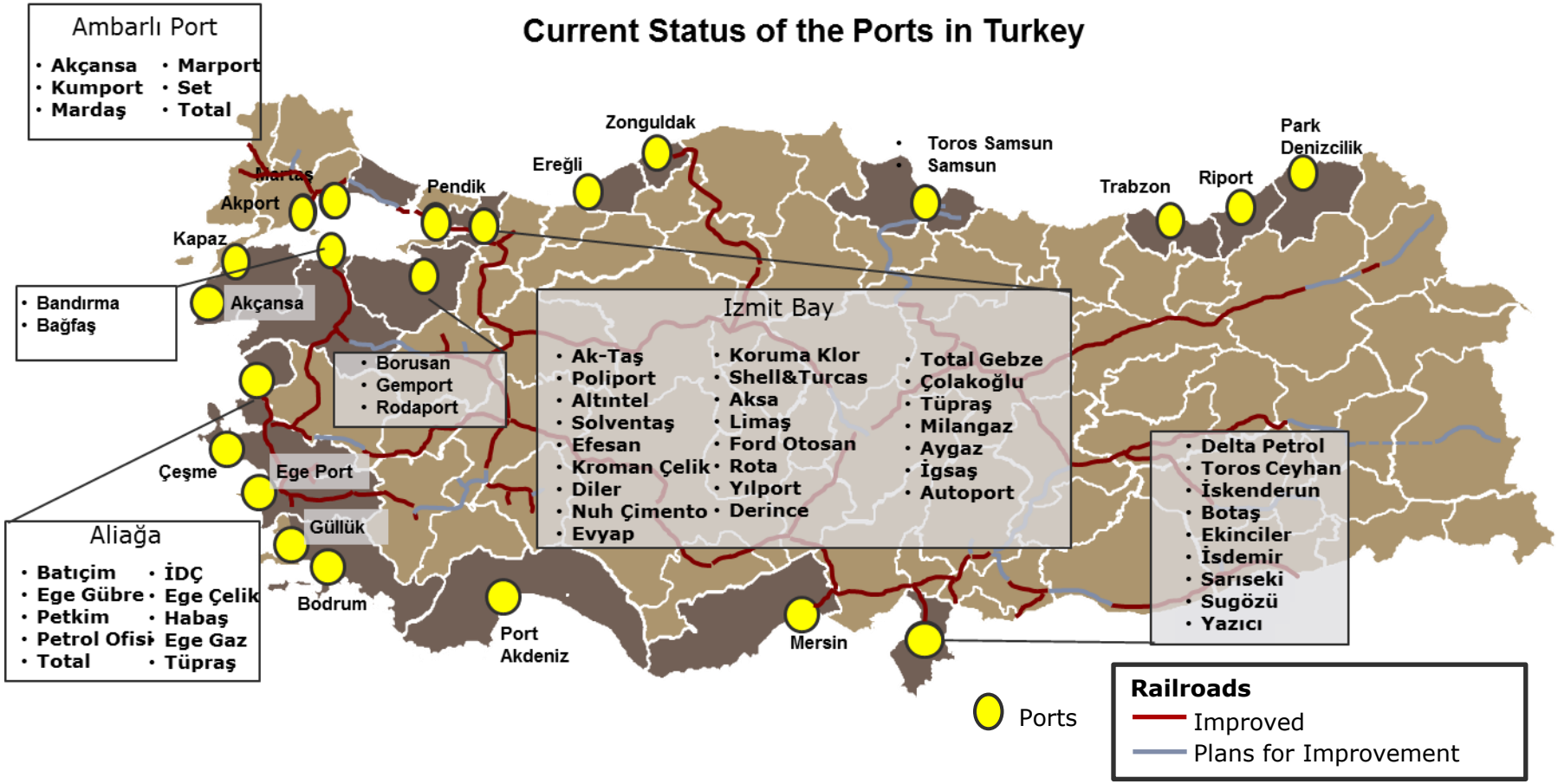
Source: Turkstat
Note: HS codes 27,28,29,31,32,33,34,35,36,37,38,39,40 were used in the Analysis. There may be differences due to rounding

- Additionally, Turkey has launched initiatives to start FTA negotiations with the USA, Canada, Japan, Thailand, India, Indonesia, Vietnam, Peru, the Central American countries, African, Caribbean and Pacific countries, Algeria, Mexico and South Africa.

Source: Turkstat, Deloitte Analysis, TKSD, Ministry of Economy
* Including EFTA: Iceland, Liechtenstein, Norway and Switzerland

Turkey has extensive infrastructure as ports are connected to railways.

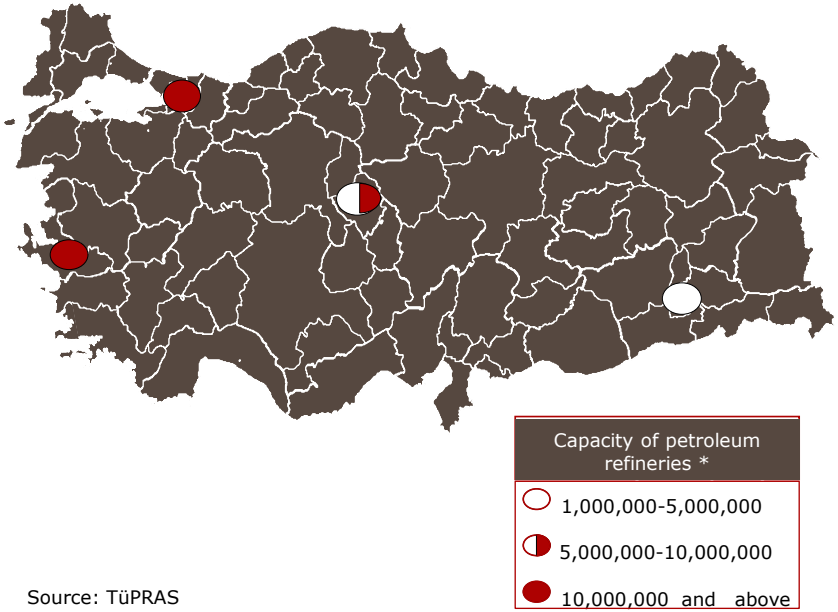
Figure 40: Ports and Railways in Turkey



Source: Ministry of Transport, Maritime Affairs and Communications, UTIKAD

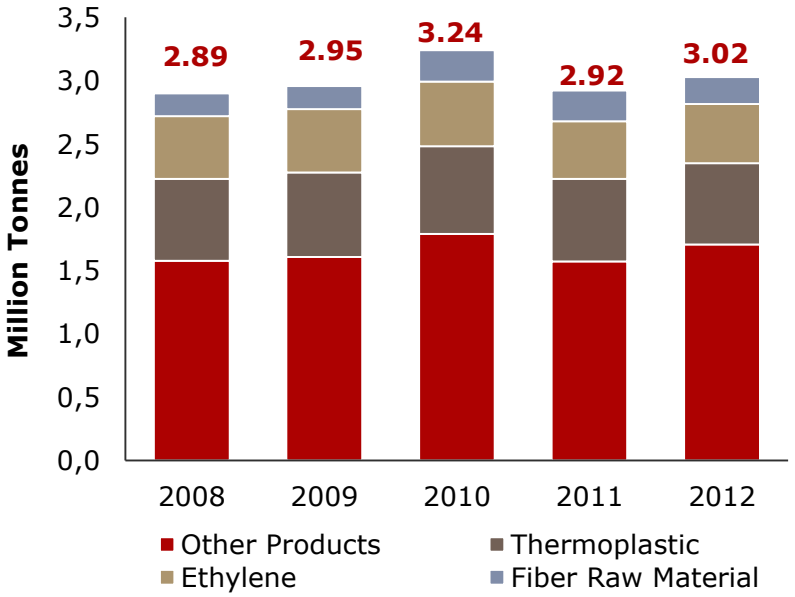
Turkey’s refineries are located near western ports.

Figure 41: Petroleum Refinery Capacities, 2012



Source: TüPRAS
* tonnes/year

Figure 42: PETKIM’s Production



Source: Petkim

- Turkey’s refining capacity exceeded 28 million tonnes in 2012. Moreover, the market size in terms of sales in 2012 was more than TL 50 million.
- Turkey’s petroleum refineries are located in Izmit, Kırıkkale, Batman and Izmir with varying production capacities. Izmit and Izmir have the largest capacities among other refineries. Another refinery investment is planned in Adana with a budget of more than TL 15 billion.
- Petkim’s total production of ethylene, thermoplastics, fiber raw materials and other chemicals industry related products were more than 3 million tonnes in 2012.

Case Study: SOCAR

SOCAR

- SOCAR Turkey has obtained the Strategic Investment Incentive Document two times. The first one was given for the building of STAR refinery, which is a deal worth USD 4.3 billion.
- Socar plans to invest USD 17 billion in Turkey by 2018. Approximately USD 7-8 billion of this investment will be used for Star Refinery. The refinery will lead to an establishment of chemicals industry park on Petkim Peninsula.
- The facility is expected to produce 1.3 million tonnes of naphtha, 455,000 tonnes of xylene per annum to be used as petrochemical raw material. Moreover, the facility will have a production capacity of 4,950,000 tonnes of ultra low sulphur diesel, 1,695,000 tonnes of jet fuel and 261,000 tonnes of LPG per annum to be used as fuel oil. Other products, namely reformat, petroleum coke and sulphure will have a capacity of 525,000 tonnes, 698,000 tonnes, and 157,000 tonnes per year, respectively. The facility is expected to be operational by the second half of 2017.
- Petkim General Manager Sadettin Korkut stated that with the Strategic Investment Incentive Document, the investments, including increasing the capacities of the production facilities that produce ethylene and pure terephthalic acid, will be easier. The increase in the production capacity of the ethylene factory will be 13%, as for the naphtha factory the increase will be 50%. With these investments the total annual production capacity will increase to 3.5 billion tonnes from 3.2 billion tonnes and the production costs will be lowered.

Source: Petkim, Emeging Markets Insight

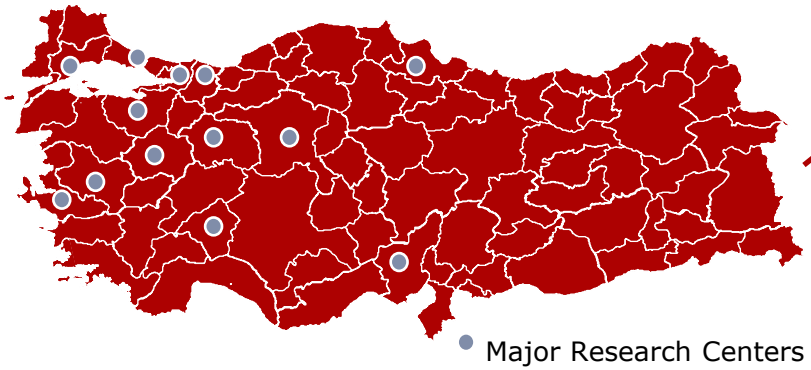
A Look at the R&D Side: More than 40 chemicals industry firms operate in Technology Development Zones.

Chemical Firms Operating in TDZs

- 2% of the firms in TDZs are a part of the chemicals industry in Turkey.
- The total number of firms in TDZs reached 2,247 in June 2013, which indicates more than 40 firms work in the chemicals industry.
- Every year, approximately 4 new TDZs are opened in Turkey. This trend in the number of TDZs is expected to continue as Turkey proceeds towards its goals for the year 2023.
- There are 72 foreign investors among the 2,209 firms in TDZs and their investments total approximately USD 683 million.
- The number of projects developed in these zones reached 5,717 in April 2013 and export total reached USD 893 million at the end of 2012.
- Firms working in TDZs applied for 322 patents.
- Employment within the TDZs consists of 15,960 in R&D and 3,536 support personnel totaling 19,496 people employed as of 2012.

Source: Ministry of Science, Industry and Technology

Moreover, there are more than 150 university and public research centers that cooperate with the industry



- To encourage research and foster innovation in Turkey, research centers are established.
- These centers conduct research in many areas including chemicals, nanotechnology, energy and other engineering related fields.

Selected Research Centers	Areas of Activity
Bilkent University	• Future networks, network technologies, novel internet architecture, future computing systems, cloud computing, future internet technologies addressing societal challenges, advanced software engineering, CT for health, ICT for governance and policy making, e-learning, intelligent tutoring systems, embedded systems, adaption of business & manufacturing processes
9 Eylül University	• 9 Eylül University's electronic materials production and application research center in Izmir conducts research in areas such as nanotechnology, biomedicine, aerospace, the defense industry and textiles.
Istanbul Technical University	• ITU's Mechatronic Education and Research Center was established to conduct research in areas such as electric and hybrid vehicles, rail vehicles and robotics among others. • The center cooperates with producers in the automotive field as well as electric and electronics manufacturers to foster innovation and growth in the industry as a whole.
TÜBITAK	• Marmara Research Center has various institutes included within it. These institutes are the Environmental Institute, the Energy Institute, the Genetic Engineering and Biotechnology Institute, the Food Institute, the Chemicals Institute, the Materials Institute and the Earth And Sea Institute. • The center has various industry partners. It works cooperatively with entities that including the Turkish Armed Forces, universities and other national R&D centers.

Source: TUBITAK, Ministry of Science, Industry and Technology
* As of July 26th, 2012

Turkish Chemicals Industry has 9 R&D centers.

- Law No. 5746 supports and encourages the development of technology so Turkish companies can become globally competitive through R&D and innovation. Moreover, it also aims to increase product quality and standards, create innovation in products and manufacturing, to decrease production costs, increase productivity, commercialize technical knowledge, develop pre-competitive R&D cooperation between rival companies, increase technology-intensive production and entrepreneurship, increase the amount of FDI directed to R&D and innovation funding, and increase employment for R&D personnel and qualified workforce.
- The law encompasses the support, incentives and exemptions given to R&D centers employing at least 50 R&D employees, R&D projects funded by public institutions or international funds, institutions that are in partnership with at least one R&D center (these institutions and R&D centers may operate in the same or different sectors), pre-competitive R&D collaboration projects, entrepreneurs supported by the Techno-Enterprise Capital Support, and technology centers established by the SME Development Administration in April 12, 1990 under Law No. 3624.

Table 7: List of Companies Operating Active R&D Centers in Turkey

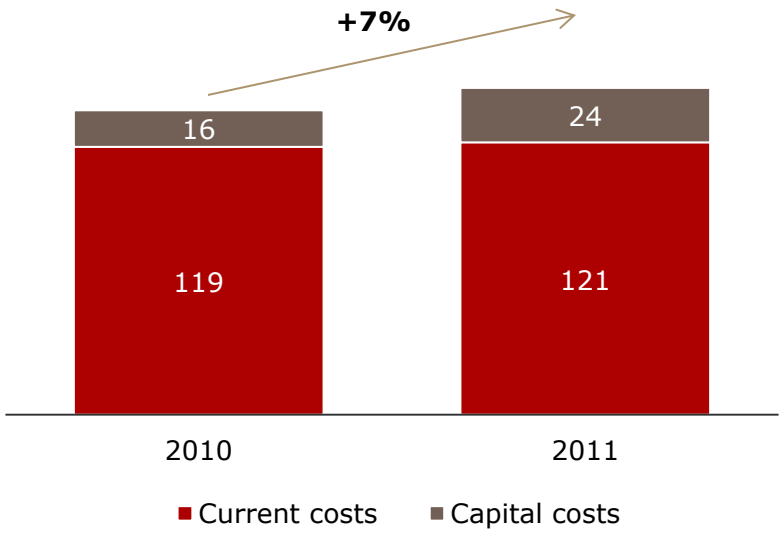
Company Name	Location
Akdeniz Kimya A.Ş.	Izmir
Aksa Akrilik Kimya A.Ş.	Yalova
DYO Boya Fabrikaları A.Ş.	Izmir
Hayat Kimya A.Ş.	Kocaeli
Kansai Altan Boya A.Ş.	Izmir
Kayalar Kimya A.Ş.	Istanbul
Organik Kimya A.Ş.	Istanbul
Setaş A.Ş.	Tekirdağ
Unilever A.Ş.	Istanbul

Source: ISPAT

- The industry received 4% of TÜBITAK grants amounting to more than TL 117 million*, calculated cumulatively from 1995 to 2012. The total support given by TÜBITAK to the chemicals industry for projects constitutes 7% of the total projects supported between 1995 and 2012, which totals 680 projects.

R&D expenditure of Turkey's chemicals manufacturing industry has increased 32% from 2010 to 2011.

Figure 43: R&D Expenditure in Chemical Manufacturing (USD Million)



Source: Turkstat, (NACE REV.2 Code:(19-20)1-22)
Note: (NACE REV.2 Code:(19-20)1 data is given together in accordance to the code of secrecy of Turkish Statistical Law No. 5429.
* Converted using the 2010 year-end USD/TL exchange rate of 1.5376.
** Converted using the 2011 year-end USD/TL exchange rate of 1.8889.

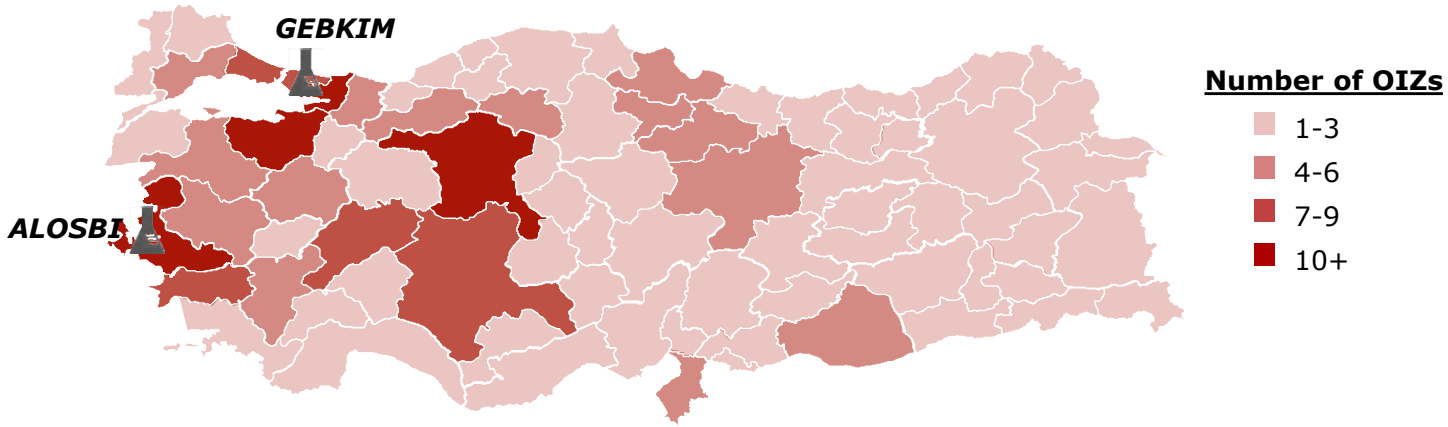
- Turkey's research and development expenditure on chemical manufacturing increased as production values, volumes and exports increased.
- Turkey's total R&D expenditure for the chemical manufacturing industry increased from USD 135* million in 2010 to USD 145** million in 2011, growing 7% in a single year.
- Current costs account for the majority of the R&D expenditure (above 80%) and grew by 2% from 2010 to 2011, nearing USD 120* million.
- Current R&D costs consist of labor and other costs. Labor costs account for 55% of total current R&D costs.
- Capital costs contribute to a smaller portion of total R&D expenditure (below 20%) with USD 24** million in 2011, growing 50% in just a year.
- Capital R&D costs are divided into equipment and machinery costs and land and buildings costs. Equipment and machinery costs account for more than 80% of total capital costs.

Investment Tip: R&D investments can be supported by EU funding, provided they fulfill certain criteria.

* Converted using the 2010 year-end USD/TL exchange rate of 1.5376.
** Converted using the 2011 year -end USD/TL exchange rate of 1.8889.

OIZs present opportunities such as tax exemption for investors ready to invest in particular zones.

Figure 44: Distribution of OIZs Across Turkey



Source: Union of Chambers and Commodity Exchanges of Turkey

- Organized Industrial Zones (OIZs) are designed to allow companies to operate within approved boundaries with high quality infrastructure. The main objectives in establishing OIZs are to promote industries in less developed regions, enabling relationships among industries to grow and allowing more cooperation between industrial firms that increase production overall along with an increase in profits.
- Firms operating in the OIZs can benefit from advantages such as exemption from VAT in land acquisition, exemption from real estate taxes for five years starting from the construction of a plant, and exemption from the municipality tax for construction and usage of a plant.
- Of the total 263 OIZs in Turkey, 148 are currently operational. There are two sole chemical-related clusters that exist in Turkey: ALOSBI (Aliağa Organized Industrial Zone) and GEBKİM (Gebze-Kocaeli Chemical Organized Industrial Zone).

Further opportunity awaits industry investors as chemicals industry clusters emerge throughout Turkey.

- Turkish companies operating in the chemical industry experience difficulty in finding land. Many chemical products are known to have toxic effects on human and environmental health and are considered dangerous. Containing this type of production in specialized chemical regions will minimize the impact of the industry. Therefore, it is imperative to attract investments to specialized areas in order to advance the industry.
- Clustering is a tested and reliable method to increase industrial competitiveness. Investing in specialized industrial regions and implementing the sector-based clustering method helps solve the industry's environmental issues and provides a competitive setting for investments. Turkey's chemicals industry is establishing these clusters in order to enhance its competitive position.
- The principles of 'economies of scale' become apparent when one invests in Turkey's chemical sector, which is import dependent for the acquisition of chemical raw materials. As the scale of production increases, the unit cost decreases. In a capital intensive industry such as the chemical industry, large scale investments are not possible without foreign direct investment.

- **Specialized chemical regions will be established on the coast, integrated with the surrounding ports and sea-land-railway transportation system.**
- **TDZs located in specialized chemical regions and/or regions where the chemical industry is dense will help the industry grow in terms of number of companies and overall development.**

Source: 2011-2015 Chemicals Strategy Paper and Action Plan

Chemical manufacturing clusters will increase to advance the production of chemicals and to preserve the environment.

- GEBKIM is located on a total of 2.4 million square meters in the Gebze-Kocaeli region and is Turkey's first solely chemical OIZ. Currently, there are 40 member companies in GEBKIM. It is located 3 km away fro the TEM highway and 4 km to the closest port in the town. GEBKIM OIZ provides cleaning services, a fire brigade, a truck parking lot, a gas station and a clinic along with high quality infrastructure.

- ALOSBI is based on 1.7 million square meters of land in Izmir and had been designed to attract chemicals industry investment to the Aegean region. It has access to sea transportation via Izmir's port and has modern infrastructure. It aims to install 100 chemical facilities and a facility for liquid storage. Currently, 58% of the zone is occupied, leaving 164 property lots open. According to plans of the site, ALOSBI will comprise of a shopping center, sports facilities, a clinic, social and cultural facilities, a nursery, a high school and job training facilities, a techno-park and housing, which will make ALOSBI a live-in industrial center.

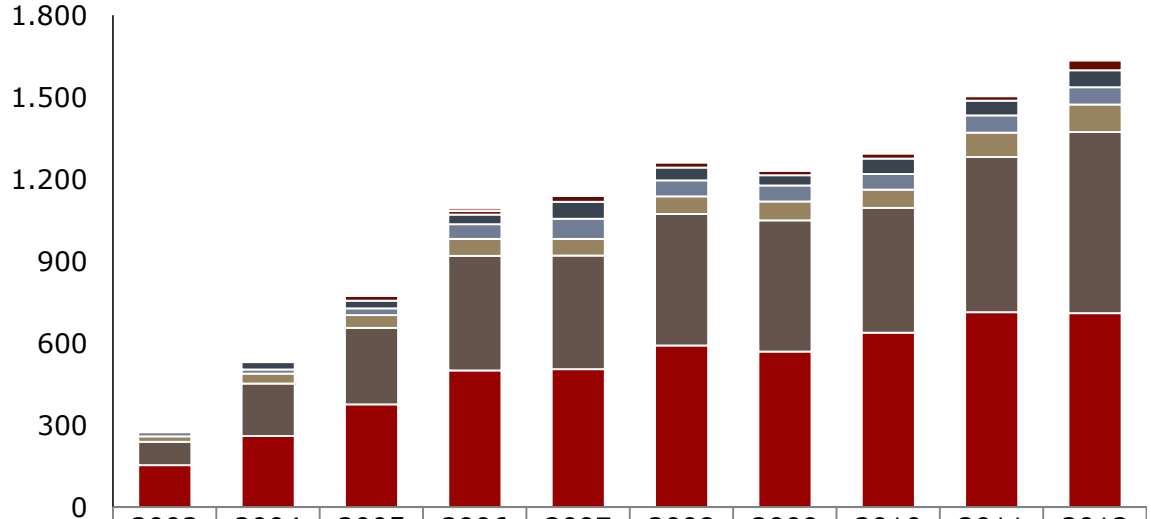
Source: www.gebkim.org.tr , www.alosbi.org.tr

Bandırma Specialized OIZ

- Producers active in the chemicals industry have initiated a project to build a complex of ports, storage facilities, industrial production facilities and various service areas. The complex will be situated in Southern Marmara (in Bandırma, an area located between the Gulf of Izmit and Biga) and will have a total area of 30 million square meters. The project will follow a clustering model.
- The clustering model will enable the firms to cooperate through know-how transfer and improve their products. The firms operating in the chemicals cluster will be able to take advantage of economies of scale.

As a result of the increasing number of TDZs, R&D centers and OIZs, innovation in Turkey has greatly increased.

Figure 45: Number of Patent Applications According to Sub-Sector, 2003-2012



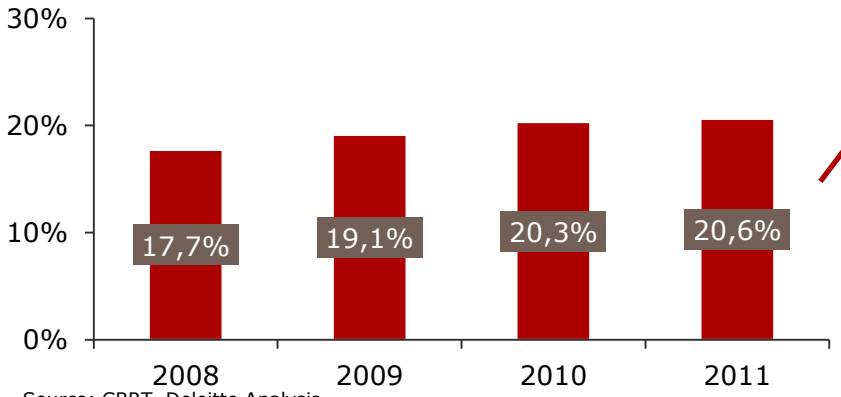
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Paint and coating	1	3	4	12	1	2	2	4	4	1
Artificial fiber	3	7	18	13	21	18	17	18	17	36
Other chemicals	6	27	28	35	62	47	37	57	53	63
Cosmetics and detergents	15	15	24	53	74	59	58	57	64	63
Pesticides	20	37	47	63	60	64	70	67	89	100
Primary chemicals	85	192	280	419	416	481	479	456	567	663
Plastics and rubber	154	260	376	500	505	592	570	639	714	710

Source: Turkstat

- The number of patent applications for the industry has grown since 2003. The main drivers are applications for primary chemicals and for plastics and rubber products. These have accounted for 40.5% and 43.4% respectively of total applications in 2012.
- The total number of applications grew at a CAGR of 21.5% from 2003 to 2012.
- Plastics and rubber patents or advantageous model appeals grew CAGR 19% from 2003 to 2012, while primary chemicals grew a staggering CAGR 26% during the same period.

The gross profit margin of the industry indicates a thriving market.

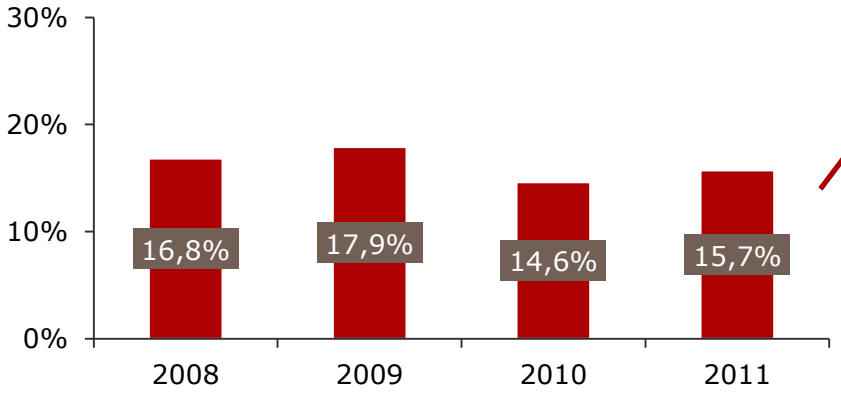
Figure 46: Gross Profit Margins of Turkey's Basic Chemicals Industry



Source: CBRT, Deloitte Analysis

- With strong growth in the industry, profit margins have also grown. The gross profit margins for Turkey's basic chemicals industry has been growing for the past 4 years. The reported gross profit margin for 2011 was 20.6%, having surpassed its previous value for growth of 17.7% in 2008.

Figure 47: Gross Profit Margins of Turkey's Plastics and Rubber Industry



Source: CBRT, Deloitte Analysis

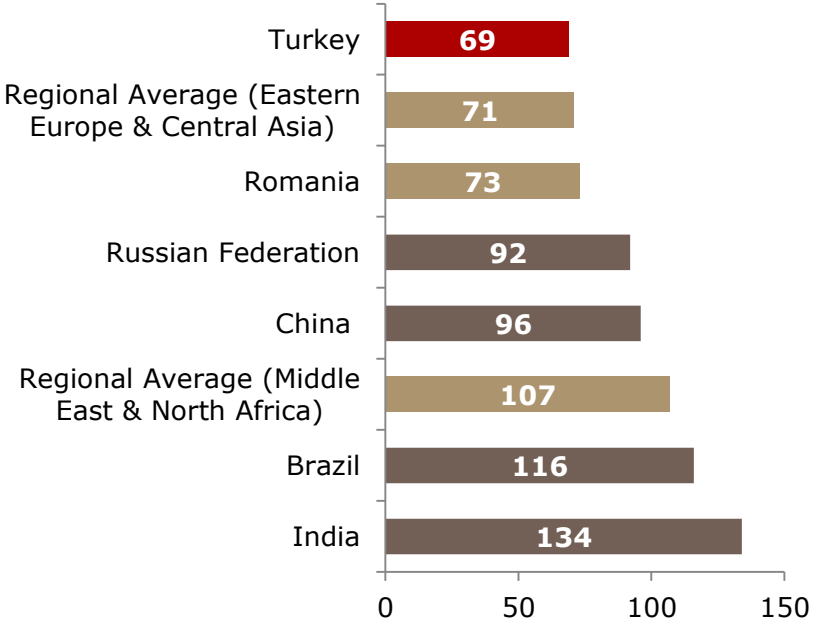
- Turkey's plastics and rubber industry margins were squeezed compared to earlier years following the global trend in the industry. The gross profit margin rate was 16.8% in 2008, but later decreased to 15.7% in 2011.

Overall, Turkey is 69th in Doing Business 2014 Report

- Foreign Direct Investment Law in Turkey – which complies with international standards- came into force in 2003. The objective of this Law is to regulate the principles to encourage foreign direct investments; to protect the rights of foreign investors; to define investment and investor in line with international standards; to establish a notification-based system for foreign direct investments rather than screening and approval; and to increase foreign direct investments through established policies.
- With this law, unless stipulated by international agreements and other special laws:
  1. Foreign investors are free to make direct investments in Turkey,
  2. Foreign investors shall be subject to equal treatment with domestic investors.
- As a result, the number of expats has increased significantly. According to the Ministry of Labor and Social Security, number of work permits given to foreigners increased by 86% in 2012 reaching 32,272. Since 2003 a total of 125,697 permits were provided to foreigners.
- It is also crucial to note that the availability of free transfer of funds in Turkey adds positively to its investment friendly environment.

- According to Doing Business 2014 report by the World Bank, Turkey is ranked 69th among 189 countries on the ease of doing business.
- Turkey has a higher ranking compared to BRIC countries. The averages of Eastern & Central Asia and Middle East & North Africa are ranked 71st and 107th respectively, below the rank of Turkey.

Figure 48: Ease of Doing Business Analysis Ranking, 2014



Source: Doing Business 2014, The World Bank

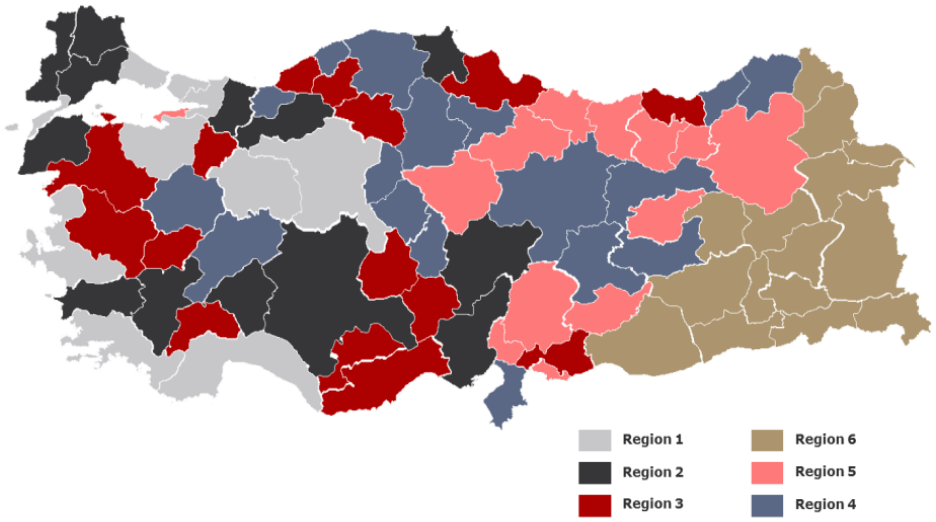
D. The Policy and Regulatory Landscape of the Industry

i. Incentives

ii. Environmental Impact Assessment

Turkish Investment Incentives Program: Various incentives are available both for CAPEX and OPEX.

Figure 49: Incentive Regions



- The investment incentive program of 2012 comprises 4 different plans: general, regional, large scale and strategic.
- All investment types, except the ones that are specifically excluded from the investment incentives program, will be supported by the General Investment Incentives Program. Under this scope, the minimum fixed investment amount is TL 1 million in Region 1 and 2 and TL 500,000 in Regions 3, 4, 5 and 6.

Table 8: General and Regional Investment Incentives

Support Measures	General Inv.	Regional Inv.	Large Scale Inv.	Strategic Inv.
Vat Exception	✓	✓	✓	✓
Customs Duty Exemption	✓	✓	✓	✓
Tax Deduction	☒	✓	✓	✓
Land Allocation	☒	✓	✓	✓
Interest Support	☒	✓	☒	✓
Vat Refund	☒	☒	☒	✓
Employer's Social Security Premium Support	☒	✓	✓	✓
	Only For Region 6			
Income Tax Withholding Support	✓	✓	✓	✓
Employees' Social Security Premium Support	☒	✓	✓	✓

REGIONAL INVESTMENT INCENTIVE PLAN MEASURES							
Region	OIZ	1	2	3	4	5	6
Tax Reduction (%)	Out of OIZ	15	20	25	30	40	50
	Within OIZ	20	25	30	40	50	55
Employer's Social Security Premium Support Period (years)	Out of OIZ	2	3	5	6	7	10
	Within OIZ	3	5	6	7	10	12

Source: Ministry of Economy

Strategic investment incentives are given to support production of intermediate and final products.

- Certain investment categories are supported by the Large Scale Investment Incentive Plan with varying industry investment amounts in order to receive incentives. The chemicals industry, specifically petrochemicals sector, is eligible depending on the investment amount.
- Strategic investment incentives are given to support production of intermediate and final products with high import dependence in order to reduce the current account deficit. In order to be eligible for this support:
  - Production of intermediate and final goods must have high import dependence, specifically more than 50% of the production must be done via imports.
  - The minimum investment amount of TL 50 million.
  - The goods produced must have at minimum 40% value added (not applicable to refined petroleum and petrochemicals production investments).
  - The import values of goods produced in the previous year must be at least USD 50 million (not applicable to goods with no domestic production).

Table 9: Large scale investment requirements

LARGE SCALE INVESTMENT REQUIREMENTS	
Investment Subject	**Minimum Investment Amount (TL Million)**
Production of Refined Petroleum Products	1,000
Production of Chemical Products	200

Source: Ministry of Economy

Table 10: Large scale investment incentives

LARGE SCALE INVESTMENTS INCENTIVE PLAN MEASURES							
Region	**OIZ**	**1**	**2**	**3**	**4**	**5**	**6**
Tax Reduction (%)	**Out of OIZ**	25	30	35	40	50	60
	Within OIZ	30	35	40	50	60	65
Employer's Social Security Premium Support Period (years)	**Out of OIZ**	2	3	5	6	7	10
	Within OIZ	3	5	6	7	10	12

Source: Ministry of Economy

The National Environmental Political Act minimizes the environmental damage caused by the industrial activities of the chemicals industry.

Figure 50: Environmental Impact Assessment (EIA) Regulation Application Process

- If under the scope of Annex 1the document is send to the Ministry, if under the scope of Annex 2 it is presented to the Office of the Governor.
- Projects under the scope of Annex 2 may or may not require EIA. However, each project in Annex 1 requires EIA approval if not stated otherwise.
- Project is reviewed by the Ministry. EEC is established to review the project
- Public participation meetings are held
- Report is presented to the Ministry
- Report is evaluated by the EEC and finalized
- Report is presented to public for comments.
- EIA application approval decision made by the Ministry as to whether the investment can begin.

Source: Ministry of Environment and Urban Planning
Note: Ministy in the above figure is Ministry of Environment and Urban Planning
*EEC: Examination and Evaluation Committee

- **The Environmental Impact Assessment (EIA) is** a procedure governed by EIA Regulation and is conducted to outline and minimize the environmental impact of a proposed project. There are two procedures under the Regulation: the Annex 1 Procedure for large scale projects and the Annex 2 Procedure for smaller scale projects, as shown in the figure above. Normally, the interim approval process in the Ministry takes 2 months to complete. But it may take up to 18 months to prepare the EIA report by the investor.
- In Specialized Organized Industrial Zones, an EIA will be conducted for the Industrial Zone as a whole. Provided that the enterprises planning to set up in these zones do not use different manufacturing processes than those under review in the EIA report, they do not have to obtain a separate EIA approval. Moreover, the EIA process takes 10-15 days less because there is no public participation meetings held. This was the case in the Kocaeli-Gebze V (Chemicals) Industrial Zone. An EIA approval is obtained for the industrial zone as a whole. There is no need for enterprises setting up there to apply separately for EIA approval.

E. Strategic Goals and Action Plans

i. Quantitative Goals for 2023 for the Chemicals Industry

ii. Strategic Action Plan for the Chemicals Industry

iii. Input Supply Strategy for the Chemicals Industry

Turkey's ambitious 2023 targets for the chemicals industry include USD 50 billion in exports.

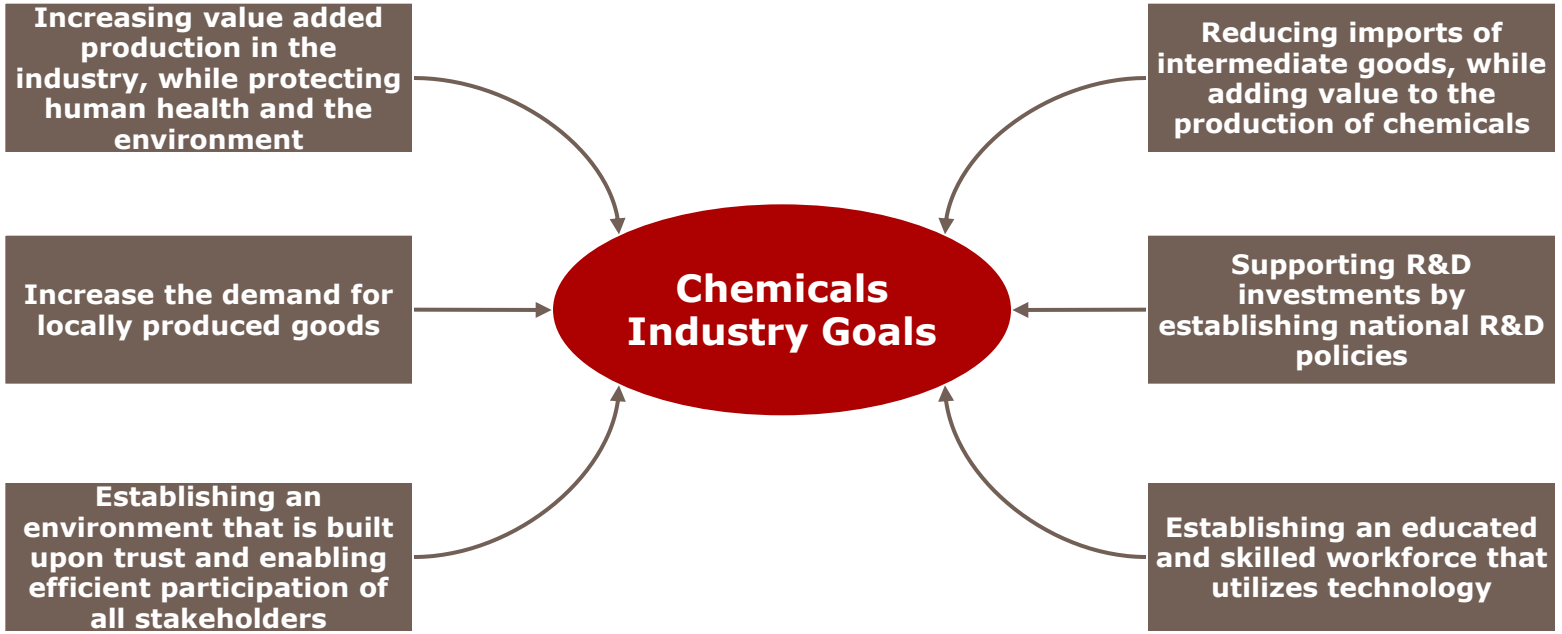
- According to Turkey's *Chemicals Industry Strategy and Course of Action Document*, there are six strategic targets. These are:
  - ***Producing high value added, environmentally friendly products to grow the exports market.***
  - ***Transforming facilities to enable high value added production so as to decrease intermediate goods import.***
  - ***Structure R&D policies specifically designed for the industry.***
  - ***Educate a high skilled workforce for the industry.***
  - ***Develop and ensure a cooperative environment for the stakeholders of the industry.***
  - ***Increase demand for locally produced products to reduce foreign trade.***

- Turkey's chemicals export goal for 2023 is **USD 50 billion**, securing a 0.79% share of the global chemicals market. The sector aims to represent 9.17% of Turkey's total exports. The 2023 quantitative targets for export in the industry's sub-sector can be summarized as follows:
  - ***Organic and inorganic chemicals: USD 5.9 billion***
  - ***Mineral fuels and mineral oils: USD 11.7 billion***
  - ***Paints and raw materials: USD 2.5 billion***
  - ***Soaps, detergents, cosmetics: USD 3.3 billion***
  - ***Plastics and rubber products: USD 23.3 billion***
  - ***Pharmaceuticals: USD 3.3 billion***

Source: TIM, Ministry of Science, Industry and Technology

The Ministry of Science, Industry and Technology prepared 2012-2016 strategic goals for the chemicals industry.

- The main objective of the abovementioned strategy document is to achieve continued growth in the Turkish chemicals industry.
- Strategies for the chemicals industry in Turkey for the period of 2012-2016 can be summarized as follows: increase the competitiveness and efficiency of the Turkish chemicals industry, expedite the transformation of the industry structure to a more competitive state (where high-tech products with high added value are produced), guarantee a qualified workforce and establish an industry that is sensitive to the environment and the society.



Source: Ministry of Science, Industry and Technology

The government's GITES Strategic Action Plan for chemicals and fertilizers introduces further opportunities in the industry.

- The Input Supply Strategy (GITES), coordinated by the Ministry of Economy, addresses the dependence of production on imported inputs. Due to fluctuations in commodity prices around the world, Turkey has developed strategic action plans. The strategic plan forms synergies between exports, production, investments and employment policies in order to cope with these fluctuations and create value added production and manufacturing, which will allow Turkey to increase its exports.

	Strategic Goals	Overview
1	**Meeting the investment needs for the petrochemicals industry**	The majority of the main raw materials used in the petrochemicals and the plastics industry is met through imports. The largest value-added production chain, from crude oil to final plastic product, is provided by monomer production. Naphtha, monomer and polymer production hold great importance for integrated refinery and petrochemical investments, which would ensure the security of the industry's supply lines and increase domestic added value potential.
2	**Decreasing the cost and facilitating the supply of oil and natural gas, both used as raw materials**	Raw materials that are subject to fuel control policies complicate supply opportunities in the chemicals industry. Distinguishing between intermediate goods and fuel functions for both LPG and natural gas that are used as raw materials will be effective in reducing raw material costs, and will facilitate supply opportunities. As an alternative raw material, LPG is combined with naphtha in the petrochemicals industry. Natural gas constitutes a large share of fertilizer production costs as a raw material to process ammonia which is a basic input for all fertilizer varieties. Existing ammonia plants are operating under-capacity due to cost problems.
3	**Developing standards for the plastics sector's raw materials and implementing them effectively**	The use of non-standard scrap and raw materials reduces the quality of plastics production, whose products are used as inputs for many sectors and poses a risk for the environment and human health. Also, developing standards is important in terms of more efficient use of domestic resources.

Source: Ministry of Economy

GITES – The Strategic Action Plan for the Chemicals Industry

	Strategic Goal	Overview
4	**Ensuring efficient procurement of and reducing external dependency of raw materials in the rubber industry**	The entire raw material requirements of the sector is met through imports. Natural and synthetic rubber imports in 2010 reached USD 1 billion. Dependency on raw materials creates a risk to the security and continuity of supply and inhibits the production of final products. By-products of petrochemicals production such as C3 and C4 chemicals are exported with low added-value due to the absence of production facilities in Turkey. Measures guaranteeing security and continuity of supply; and the targeting of efficiency and productivity have to be taken.
5	**Increasing the production of high value added products via the use of local and alternative sources**	It is vital to increase the use of domestic and alternative sources starting with inorganic chemicals products, and to improve production of high value added products like fine chemicals and advanced composites.
6	**Making much needed investments in the fertilizer industry**	The status quo of fertilizer production - which is one of the most important inputs in the agricultural sector – shows an industry unable to meet domestic consumption. To cope with this problem, investments in the fertilizer industry are crucial for increasing domestic production. Investing in countries with a low supply of raw materials or supplying raw materials at competitive prices through partnerships in these particular countries as domestic production increases would allow sustainable competitiveness.
7	**Reducing import dependence on raw materials in the paint industry**	The paint industry is currently importing approximately 70% of the raw materials used in production, which causes a decrease in industrial competitiveness by increasing freight costs and inventory costs. Therefore, opportunities should be considered for domestic production of main raw materials of the industry.
8	**Increasing the effectiveness and efficiency of the input supply of cosmetics and cleaning products**	The sector is import dependent on herbal ingredients such as palm oil, which has many uses in cosmetics and cleaning production. Producing processed raw materials in our country for use within this field would be crucial to ensure cost advantages in the raw material supply line and keeping more added values within the country.

Source: Ministry of Economy

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