TURKISH CHEMICAL INDUSTRY, 2015-2016

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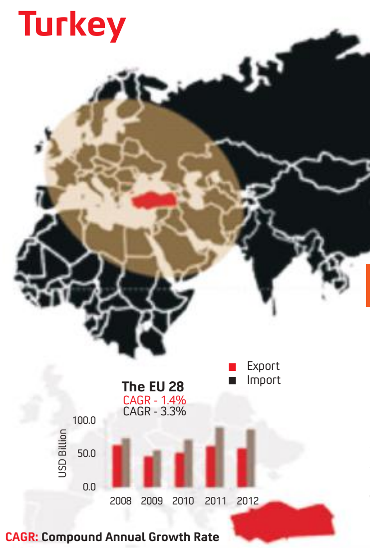


CAGR: Compound Annual Growth Rate

INTERNATIONAL TRADE

Regions	Trade Volume (USD billion)
Free Zones in Turkey	3.34
Europe (EU)	146.65
Europe (Non-EU)	51.78
North America	21.75
Central & South America	8.11
Middle & Near East	63.86
Africa	19.28
Asia & Pacific	61.53
Other	12.71
Total	**389.01**

INTRODUCTION

The chemical industry in Turkey greatly benefitted from the export-oriented economic policy changes in 1980, and has shown an impressive increase both in production and exports during the last five years, contributing significantly to the growth of the national economy. Currently, the Turkish chemical sector – with its modern technology and diversified products – is the key component of the manufacturing industry and integrated into the supply chain of national industries, especially the textiles and automotive sectors.

The Turkish chemical sector covers a wide range of products in 14 distinct product chapters In foreign trade statistics. The production of the sector is generally aimed at the products required by the manufacturing industry and the directly consumable products; namely, petrochemicals, thermoplastics, fertilizers, organic and inorganic chemicals, pharmaceuticals, synthetic fibres and yarns, soap and detergents, paints, etc. A total of 126 million tons of chemicals were produced in 2010. About 84% of production originates from the private sector.

Most of the companies in the chemical industry, especially private sector companies, are located in Istanbul, Izmir, Kocaeli, Sakarya, Adana, Gaziantep and Ankara. The Turkish chemical industry has developed significantly in terms of quality, productivity and protection of the environment, and has been successful in adopting the EU's technical standards. In addition, Responsible Care, the chemical industry's trademarked voluntary initiative on environmental, health and safety issues, has been successfully implemented since 1992.

The Turkish CLP (Classification, Labelling and Packaging) by-Law was issued in December 2013. Implementation for substances will be obligatory after January 1, 2015. For mixtures, the deadline is June 1, 2016.

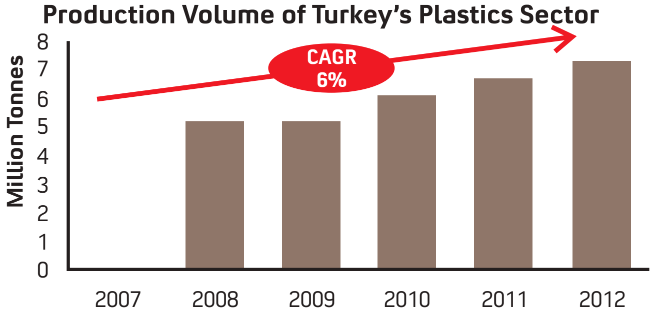
PETROCHEMICALS

The Turkish petrochemicals industry has shown considerable growth since 1970. The dominant organisation in the Turkish petrochemical sector is Petkim PetroKimya Holding A.Ş., which was privatised recently. There are two petrochemical complexes – one being the Petkim Aliaga complex in İzmir and the other Tupras (Turkish Petroleum Refineries Corporation) Korfez Petrochemical and Refinery in Kocaeli. In these two complexes, a wide range of petrochemicals, all common plastics (HDPE, LDPE, PS, PVC, and PP), aromatics,

TURKEY IN BRIEF

Capital City	Ankara
Population	78.7 million (2015)
Labor Force (Population)	29.7 million (2015)
Median Age	31,1 (2015)
Time Zone	GMT +2
Neighboring Countries	Bulgaria, Greece, Syria, Iraq, Iran, Azerbaijan, Armenia, Georgia
Major Cities (Population)	Istanbul (14.7 million), Ankara (5.3 million), Izmir (4.2 million), Bursa (2.8 million), Antalya (2.3 million) (2015)
Currency	Turkish Lira (TRY)
Financial Center	Istanbul
GDP	USD 729 billion (2015 - Current Prices)
GDP Per Capita	USD 9,261 (2015)
Exports Value	USD 144 billion (2015)
Imports Value	USD 207 billion (2015)
Foreign Direct Investment	USD 16,8 billion (2015)
Number of Companies w/ Foreign Capital	46,756 (2015)
Inflation Rate	8,81% (CPI - 2015)
Major Exports Markets	Germany (9.3%); UK (7.3%); Iraq (5.9%); Italy (4.8%); USA (4.4%); France (4.1%); Switzerland (3.9%); Spain (3.3%); UAE (3.3%); Iran (2.5%) (2015)
Major Imports Sources	China (12%); Germany (10.3%); Russia (9.8%); USA (5.4%); Italy (5.1%); France (3.7%); South Korea (3.4%); Iran (2.9%); India (2.7%); Spain (2.7%) (2015)
Trade Agreements	• Customs Union Agreement with the EU, • Free Trade Agreements with Albania, Bosnia Herzegovina, Chile, Croatia, EFTA member countries (Switzerland, Norway, Iceland and Liechtenstein), Egypt, Georgia, Israel, Jordan, Macedonia, Montenegro, Morocco, Palestine, Serbia, Syria, Tunisia
Airports	52 (21 international)

Production Volume of Turkey's Plastics Sector



Source: PAGEV

ethylene glycol, phthalic anhydride, terephthalic acid, carbon black, synthetic rubber, acrylonitrile and caustic soda are produced. The total production of these petrochemicals reaches about 2.9 million tonnes/year, and meets about 25% of domestic demand.

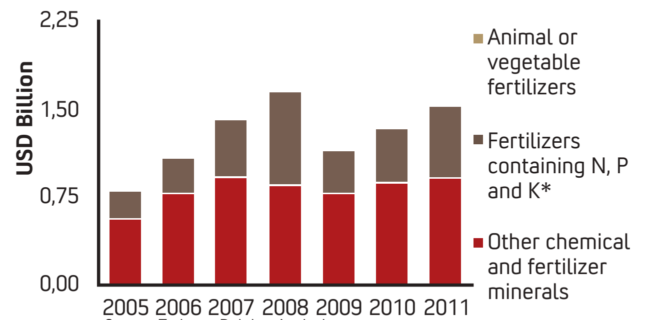
TEXTILE FIBERS

Since the textile sector is well-developed in Turkey, polymer production related to textiles and the production of textile chemicals have also developed simultaneously. Large plants for the production of polyamide, polyester and acrylic fibres have been built, and production has been directed to both foreign markets as well as the domestic. Almost all synthetic fibres are produced by the private sector, and synthetic fibre production is around 850 000 tonnes/year.

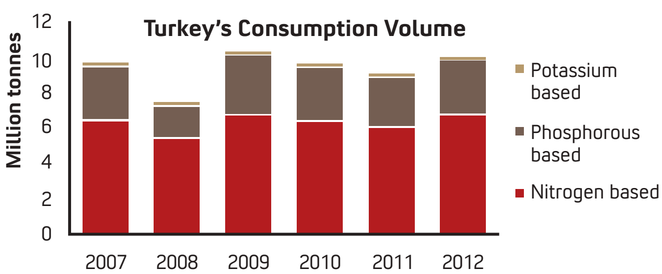
FERTILIZERS

The fertilizer industry is also one of the key industries for Turkey, which has been supporting vast agricultural potential of the country. Currently, there are seven private sector companies producing fertilizers with total production capacity of 5.8 million tonnes/year. Turkey's fertilizer production meets domestic demand and the surplus is exported.

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).

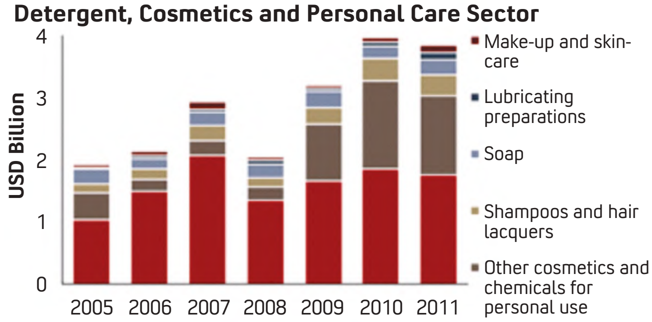


Source: Ministry of Agricultural and Rural Affairs, Turkstat

SOAP, DETERGENTS AND COSMETICS

The Turkish soap and detergent industry has shown very good performance in terms of quality, capacity and exports. There are many companies in the soap and detergent industry, about 15 of them being the major ones; among these there are multinational groups which have worldwide reputations. Since 1990 domestic and foreign investments in the Turkish cleaning products industry have increased considerably. As a consequence, detergent production capacity has reached 1.3 billion tonnes and soap production capacity has reached 550 000 tonnes; both have great export potential. The consumption and production of cosmetics and personal

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



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, Deioitte Analysis

care products are growing rapidly. The number of cosmetics and personal care products is increasing every year. Hair care has the largest share of the cosmetics and personal care products market in Turkey. Natural cosmetic production is on the rise, due to growing demand for these products.

PHARMACEUTICALS

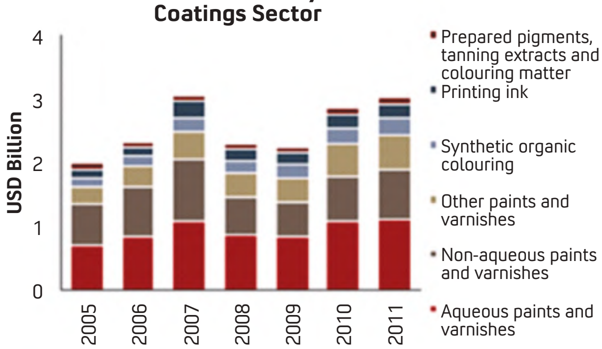
The pharmaceuticals industry has become one of the leading sectors of the chemical industry, accounting for approximately 10% of the chemical industry's production. Production trends of pharmaceuticals are closely related to domestic demand. Turkish pharmaceutical companies manufacture a wide range of pharmaceutical products, mostly generic formulas. The number of pharmaceuticals

on the market is 3 100 and this number reaches 7 200 when alternative posologies are included. It is worth mentioning that the Afyon Alkaloids Factory produces 20% of the morphine consumed by pharmaceuticals industries all over the world.

PAINT AND COATINGS

Parallel to the developments in Turkey's construction, automotive and marine industries, the paints and coatings industry has also developed to become one of the most dynamic sectors of the Turkish chemical industry. Today the industry produces about 800 000 tons/year of paints and coatings and is comprised of about 600 manufacturers, 20 of them being large-scale companies. In addition to meeting domestic demand, the Turkish paint sector has recently tended to export more.

Production Value of Turkey's Paint and Coatings Sector



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

SODA ASH

Turkey has the largest soda factory in the Middle East, with a total capacity of 750 000 tonnes per year. In addition to light and dense soda ash, refined sodium bicarbonate and sodium silicate are produced at the Mersin plant. An extremely rich trona (natural soda ash) deposit was found near Ankara, at Beypazari and at present Turkey has substantial export potential for soda ash. Eti Soda A.č. started operation in 2009, with 1 million tonnes/year soda ash planned to be produced.

CHROMIUM CHEMICALS

Being among the top five countries supplying chrome ore to world markets, Turkey produces and exports some of the most important chrome chemicals and derivatives such as sodium bichromate, basic chrome sulphate, chromic acid and chrome oxide.

BORON AND SODIUM SULPHATE

Turkey also enjoys a comparative advantage in boron chemicals – borax decahydrate, borax pentahydrate, boric acid and sodium perborate – due to the size of its reserves, the quality of minerals and proximity to consumer markets. Eti Maden Isletmeleri Genel Mudurlugu is the dominant producer of boron minerals and boron chemicals and the sole exclusive exporter of boron chemicals.

Turkey has developed a substantial capacity and production of sodium sulphate. In sodium sulphate production, Turkey is second largest in Europe and sixth in the world.

MEDICINAL AND AROMATIC OILS

Owing to Turkey's climatic and ecological conditions, many medicinal and aromatic plants are cultivated or gathered from nature. Turkey is one of the most important rose oil exporters in the world market. The majority of

INTERNATIONAL TRADE OF CHEMICALS

TURKISH CHEMICAL INDUSTRY EXPORTS & IMPORTS BY PRODUCT GROUPS

		TURKISH CHEMICAL INDUSTRY EXPORTS & IMPORTS (2012-2014) Arithmetic Averages for the Last Three Years			
STIC REV 3	**PRODUCT GROUPS**	**EXPORTS, MILLION**	**TOP 10 EXPORT COUNTRIES**	**IMPORTS, MILLION**	**TOP 10 IMPORT COUNTRIES**
51	Organic Chemicals	$572	Italy, Spain, USA, China, Greece, Holland, Portugal, Iran, Azerbaijan, Israel	$5.257	China, USA, Germany, S. Arabia, Netherlands, Russia, Spain, UK, India, Belgium
52	Inorganic Chemicals	$1.262	China, Italy, USA, Egypt, Spain, Belgium, Russia, UK, India, France	$1.574	Russia, China, Egypt, Germany, Morocco, Ukraine, Italy, Bulgaria, France, Israel
53	Dyeing, tanning and cooling materials	$760	Iraq, Iran, Azerbaijan, Russia, Georgia, Turkmenistan, China, Egypt, Uzbekistan, Ukraine	$1.968	Germany, China, Italy, India, Spain, France, Belgium, UK, Netherlands, USA
54	Medicinal and pharmaceutical products	$794	Germany, S. Korea, Iraq, Iran, Switzerland, USA, N. Cyprus, Azerbaijan, Russia, UK	$4.522	Germany, USA, Switzerland, France, Italy, UK, Ireland, Belgium, India, China
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	$1.598	Iraq, Russia, Azerbaijan, Iran, Israel, Romania, Germany, BAE, Libya, Ukraine	$1.719	Germany, France, Pland, Ireland, Italy, UK, Switzerland, USA, Romania, Netherlands.
56	Mineral Chemical Fertilizers	$131	Romania, Greece, Italy, Iraq, N. Cyprus, Suriye, Tunusia, Brazil, Croatia, Lebanon	$1.440	Russia, Ukraine, Romania, Iran, Tunusia, Egypt, China, Urdun, Belgium, Litvania
57	Plastics in primary forms	$1.043	Germany, Italy, Russia, Egypt, Iran, Bulgaria, Azerbaijan, Greece, Israel, Iraq	$10.657	S. Arabia, Germany, S. Korea, Belgium, Italy, France, Iran, Netherlands, Spain, USA.
58	Plastics in non-primary forms	$2.643	Iraq, Russia, Azerbaijan, UK, Iran, Germany, Romania, France, Georgia, Libya	$1.748	Germany, China, S. Korea, Italy, France, UK, USA, Belgium, Spain, India
59	Other Chemical materials and products	$688	Iran, Iraq, Russia, Azerbaijan, Turkmenistan, Egypt, S. Arabia, Georgia, Uzbekistan, Germany	$2.704	Germany, France, Italy, China, USA, Belgium, UK, Netherlands, Spain, Egypt

these exports originate from the Isparta region. Laurel oil, thymus oil, lavender oil and origanium oil are also produced in Turkey.

In conjunction with recent industrial growth in Turkey, the consumption and production of many other chemicals are growing rapidly, and the number of chemicals produced is increasing every year. The recent developments in textile and leather chemicals are also worth mentioning, and many small- and medium- size companies have recently started to operate in these two sectors. In the Turkish chemical industry, there are about 314 companies with foreign investment. The Turkish chemical industry has a 13% share of total foreign capital in Turkey.

STRENGTHS AND GROWTH POTENTIAL OF THE TURKISH CHEMICAL INDUSTRY

- Unique geographical location for the world markets and oil & gas pipeline routes
- Presence of high younger population ratio as near-future employment potential
- Good adoption of international industry standards and EU harmonization with EU market rules
- Presence of entrepreneurial capacity/potential of SMEs and Organized Industry Zones
- Presence of well-developed industry sectoral diversity and infrastructure

Incentives by the state government were recently declared for new chemical industry investments, with the goal of reaching a US$50 billion in chemicals exports by 2023. Incentives in the form of land allocation and investment credit support for establishment of clusters of integrated chemical industry zones were also developed, both at national and at regional level, to encourage and sustain innovation and new domestic and international production facility investments.

INTERNATIONAL TRADE OF CHEMICALS

TURKISH CHEMICAL INDUSTRY EXPORTS & IMPORTS BY COUNTRY

(Arithmetic Averages for the Last Three Years) (2012-2014)

	EXPORTS		IMPORTS	
	COUNTRY	**MILLON $**	**COUNTRY**	**MILLON $**
1	Germany	$864	Germany	$4.336
2	Iraq	$855	China	$2.085
3	Russia	$614	Saudi Arabia	$2.040
4	Italy	$610	USA	$1.956
5	Iran	$568	France	$1.949
6	Azerbaijan	$470	Italy	$1.914
7	China	$387	Belgium	$1.571
8	UK	$346	S. Korea	$1.424
9	Egypt	$345	Spain	$1.263
10	Spain	$327	The Netherlands	$1.148
11	Romania	$319	UK	$1.133
12	USA	$307	India	$1.009
13	France	$282	Russia	$964
14	Bulgaria	$279	Switzerland	$753
15	The Netherlands	$230	Iran	$733
16	Georgia	$229	Egypt	$692
17	Ukraine	$208	Israel	$519
18	Saudi Arabia	$201	Ireland	$505
19	Poland	$194	Romania	$434
20	Turkmenistan	$194	Ukraine	$431
21	Belgium	$192	Poland	$412
22	Libya	$189	Japan	$376
23	Israel	$171	Sweeden	$370
24	Greece	$161	Austria	$309
25	Algeria	$156	Taiwan	$293
26	Uzbekistan	$149	Greece	$291
27	Kazakistan	$148	Thailand	$260
	Others	$2.936	Others	$4.188
	TOTAL EXPORTS	**$11.930**	**TOTAL IMPORTS**	**$33.357**