

Turkey's Chemicals Industry Expands into Global Markets

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The Turkish chemicals industry has the potential for significant growth, with increasing demand coming from both domestic and global markets. To capture this potential, the industry will need to increase production capacity and diversify its product portfolio.

The chemicals industry in Turkey produces a wide variety of products, ranging from specialty polymers to personal care products, that serve a diverse set of industrial sectors. About 70% of the chemicals produced in Turkey are used as intermediates or raw materials in other sectors, with the remaining 30% sold directly to end-users. Turkey is the 14th largest importer of chemicals in the world and the 27th largest exporter of chemicals (1).

Although the country does not have abundant fossil resources, it is a key hub for the transport of oil and gas. Oil pipelines originating from Northern Iraq and the Caucasian region (the region at the border of Europe and Asia, situated between the Black and the Caspian seas, which includes parts of Russia, Georgia, Azerbaijan, and Turkey) terminate in Turkey. A new gas pipeline running from Russia to Turkey is currently being discussed (2), and another pipeline is under construction to bring natural gas from the Caucasian region to Europe through Turkey (3).

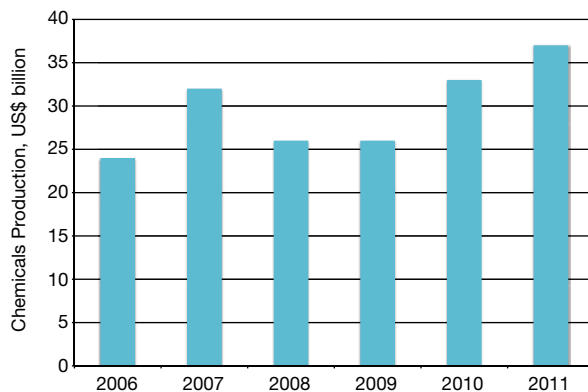
This article discusses the origins of the chemicals industry in Turkey and how this industry has evolved. It provides statistics on the country's chemicals production capacity and sales broken down by end-use sector, identifies the country's top chemicals companies, and highlights the regions where these chemicals are produced. Finally, the article outlines the future challenges and opportunities for Turkey's chemicals industry.

Note: Monetary values were converted from Turkish lira to U.S. dollars, based on year-end rates of ₺=~\$0.71 (2006); ₺=~\$0.86 (2007); ₺=~\$0.66 (2008); ₺=~\$0.67 (2009); ₺=~\$0.65 (2010); ₺=~\$0.53 (2011).

The beginning of a chemicals industry

Turkey's chemicals industry can be traced to the establishment of the first chemistry department at the only university in Istanbul in 1918. After the establishment of the Republic of Turkey in 1923, the industry saw tremendous growth.

The industry initially focused on domestic markets with manufacturing processes based on technology licensed from Europe and the U.S. The first manufacturing plants produced cement, sugar, fertilizers, glass, boric acid, caustic soda, and paper. In 1961, the first large-scale refinery was built in Turkey, followed by the first petrochemicals complex in 1962.



▲ **Figure 1.** Chemicals production in Turkey has increased after it dipped during the 2008–2009 global financial crisis.

Ups and downs of the chemicals industry

Turkey's chemicals industry has experienced ups and downs over the past decade, with very strong economic growth during the 2006–2007 period, followed by stagnation in 2008 and 2009 in the wake of the global financial crisis of that time. Recent statistics indicate a strong recovery after 2009, with total chemicals production increasing by 27% between 2009 and 2010, and by 12% between 2010 and 2011 (Figure 1).

Chemicals produced in Turkey can be classified into six categories: paints and coatings; fertilizers; detergents, cosmetics, and personal-care products; inorganic chemicals; plastics; and rubbers. Table 1 summarizes the production volume of these categories between 2009 and 2011 (the latest year for which data are available). Paints and coatings experi-

enced the largest growth — 31%, from 1.37 million m.t./yr to 2.10 million m.t./yr — between 2010 and 2011; the plastics and rubbers sectors saw growth of about 15%, while the inorganic chemicals sector and the detergents, cosmetics, and personal-care products sector grew by about 8%. Only the fertilizers segment saw a slip in production over this period. Growth in paints and coatings is likely to continue, spurred by the construction of new buildings to support the Urban Transformation Law, under which 6.5 million buildings will be demolished and replaced.

The majority of the chemicals produced in Turkey (71% in 2011, based on the value of sales) are sold as raw materials and intermediates to several other industries (Figure 2). The services sector accounts for the largest share (16%), followed by the basic metals, mining, machinery, and electronics industries, which have a share of 9%. The remaining 29% are sold to final end-users.

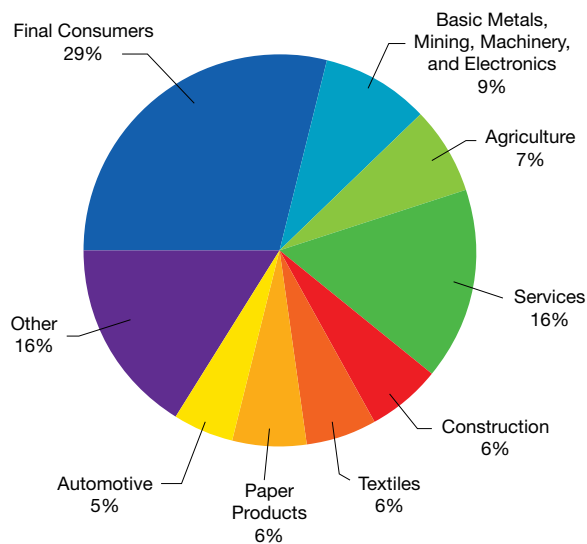
Table 1. Production of most categories of chemicals rose between 2009 and 2011.			
Product	2009	2010	2011
Paints and Coatings, m.t.			
Aqueous Paints	379,000	513,000	579,000
Nonaqueous Paints	250,000	330,000	403,000
Other Paints	663,000	644,000	985,000
Printing Inks	45,000	58,000	62,000
Pigments	31,000	59,000	73,000
Fertilizers, m.t.			
Nitrogen-Based	7,100,000	6,900,000	6,500,000
Phosphorous-Based	2,900,000	2,400,000	2,400,000
Detergents, Cosmetics, and Personal-Care Products, m.t.			
Soaps	169,000	170,000	197,000
Detergents	1,279,000	1,343,000	1,423,000
Creams	12,500	14,600	16,900
Perfumes	12,800	15,200	24,900
Inorganic Chemicals, m.t.			
Hypochlorites	228,000	314,000	347,000
Oxygen Compounds	95,000	106,000	105,000
Metal Oxides	3,950	4,75	6,870
Plastics, US\$ billion			
Industrial Plastics	4.1	5.1	5.5
Sheets and Films	0.80	0.90	1.1
Cellulosic Tubes	0.80	0.90	1.0
Polyacetals	0.30	0.50	0.80
Rubbers, US\$ billion			
Tires	1.1	1.5	1.8
Vulcanized Rubber	0.6	0.7	0.7
Tubes, Pipes, Hoses	0.2	0.5	0.6

Employment

Employment in the chemicals industry rose 20% from 2004 to 2009, by 11% from 2009 to 2010, and by another 10% between 2010 and 2011. The chemicals industry accounted for 8% of total employment in the manufacturing sectors from 2006 through 2008, 9% of total employment in 2009, and 11% in 2010 and 2011.

The main source of employees is vocational training schools and universities. In 2012, vocational training schools graduated 1,588 students, while university chemistry and chemical engineering programs graduated 6,745 students with BS degrees and 1,162 students with MS and PhD degrees.

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▲ **Figure 2.** Turkey's chemicals industry supplies raw materials to a variety of other manufacturing sectors.

Global Outlook



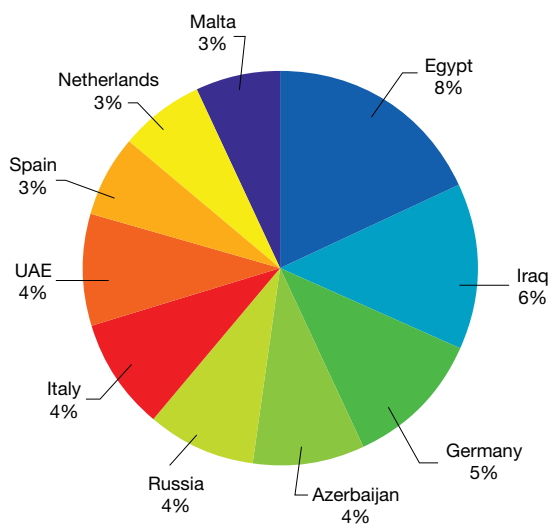
▲ **Figure 3.** Although Turkey is not rich in fossil resources, several natural gas pipelines (dotted blue lines) and oil pipelines (dotted red lines) run through the country and others are under construction. Major cities for chemicals production include Izmit, Izmir, Kirikkale, and Batman, among others.

Industrial zones

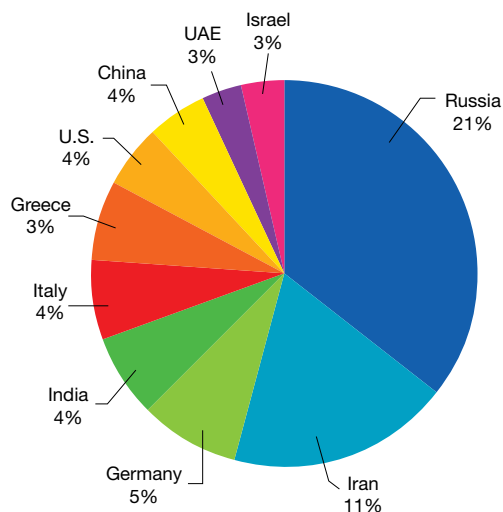
The Turkish chemicals industry is clustered in several industrial areas (Figure 3). Petroleum refineries feed many of the petrochemicals manufacturing complexes and other manufacturing facilities. The main refineries are located in the region of Kocaeli, and the cities Izmit, Izmir, Kirikkale, and Batman. The largest refineries (in Izmit and Izmir) mostly supply raw materials to adjacent petrochemicals complexes. These complexes produce ethylene, propylene, polystyrene, polyvinylchloride (PVC), and other petro-

chemicals that are the main raw materials for the smaller manufacturers in the plastics, personal-care products, detergents, and rubber sectors. The Kirikkale refinery supplies transportation fuel and chemicals to the growing industrial zones in Anatolia.

Many manufacturing complexes serving different industries are clustered around Kocaeli, which is close to Istanbul. Izmir is a strategic port, and the petrochemicals complex in the region feeds many regional industries, as well as provides the bulk of exports from the chemicals



▲ **Figure 4.** Turkey's chemicals industry exports raw materials and final products to neighboring countries. The top 10 recipients of Turkey's exports are shown here.



▲ **Figure 5.** Turkey's chemicals industry imports raw materials and final products from neighboring countries. The top 10 suppliers (led by Russia and Iran) are shown here.

Table 2. Most of the chemicals companies (top 10 listed here) are very small and employ fewer than 50 people.

Company	Sector	2013 Sales, US\$ million
TUPRAS	Refining	18,652
Petkim	Petrochemicals	1,813
Unilever	Personal Care	1,401
Turkish Sugar Factories	Sugar	1,290
AKSA	Plastics, Fibers	897
Konya Sugar	Sugar	836
Abalioglu	Animal Feed, Paint	655
Brisa	Rubber	627
Toros	Fertilizer	587
Hayat	Detergents, Cosmetics	543
Sasa	Polyester	535
Pirelli	Rubber	533
Soda Industries	Inorganic Chemicals	503

industry. Cities such as Eskisehir, Kayseri, and Konya are increasing their industrial output at a steady pace. The natural gas hubs located in Samsun and Adana could provide easy access to raw materials required by the industry.

Imports and exports

Strategically located close to several markets with increasing demand for chemicals, Turkey is the 27th largest chemicals exporter in the world. The industry's exports have increased from US\$12 billion in 2007 to US\$14 billion in

2010, and to US\$20 billion in 2012. Turkey's chemicals industry exports mainly final products to the European Union, Middle East, and Eastern Europe (Figure 4).

Turkey's chemicals industry imports raw materials and final products from neighboring countries (Figure 5). Although the two large petrochemicals complexes in Turkey produce raw materials for chemicals production, they do not produce enough to meet increasing raw material demand due to increasing domestic market size and export demand. Therefore, large volumes of raw materials and final products are imported. Turkey ranks as the 14th largest chemicals importer in the world, with imports valued at US\$55.5 billion in 2007 and US\$88 billion in 2013 (1). The largest shares of imports come from Russia (21%) and Iran (11%). Imported chemicals include (1): polyethylene (US\$1.09 billion), polypropylene (US\$1.38 billion), polystyrene (US\$0.45 billion), and PVC (US\$0.77 billion). Imports have been increasing steadily by about 10% per year since 2000 (1).

Mergers and acquisitions

The chemicals industry in Turkey has evolved and expanded into global markets. The industry consists of small and very small companies, many of which have annual sales of less than US\$1 billion (Table 2) and employ fewer than 50 people. Several mergers and acquisitions of Turkish chemicals companies have occurred during the 2008–2013 time period (Table 3). Some examples include DowAksa, the 50:50 joint venture between Dow Chemical and Aksa Karbon Elyaf Sanayi established in 2011; Brenntag's acquisition of Aromaster and Trend Gida in 2008; and Nitto Denko's acquisition of Bento Bantcilik ve Temizlik Maddeleri Sanayi Ticaret in 2012.

Table 3. With mergers and acquisitions on the rise, Turkey's chemicals industry has evolved into a global presence.

Investor	Turkish Company	Investor's Stake	Value of Deal, US\$ million	Year of Deal
Socar & Turcas Petrochemical, Azerbaijan	Petkim Petrokimya Holding	51%	2,040	2008
Brenntag, Germany	Aromaster and Trend Gida	100%	Not Available	2008
BASF, Germany	Yasar BASF Automotive Coatings	50%	Not Available	2008
Azelis, Luxembourg	Tara Kimya	100%	Not Available	2008
EGGER Group, Austria	Roma Plastik	72%	58	2010
Dabur, India	Hobi Kozmetik, Zeki Plastik, Ra Pazarlama	100%	69	2010
Grelf, U.S.	Sunjut	100%	80.3	2010
Dow Chemical, U.S.	Aksa Karbon Elyaf Sanayi	50%	92.5	2011
Nitto Denko, Japan	Bento Bantcilik	100%	100	2012
Yves Rocher, France	Flormar	51%	135	2012
SOCAR, Azerbaijan	Petkim	10.3%	168.5	2012
Georg Fischer, Switzerland	Hakan Plastik	96%	98.1	2013

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Challenges and prospects

As it looks ahead to the 2023 centennial anniversary of the founding of the Republic of Turkey, the country's chemicals industry faces the following prospects and challenges.

Production capacity. The per-capita income in Turkey is steadily increasing, expanding the consumer base for high-quality products. At the same time, Turkey is attracting investments from major manufacturing sectors, such as the automotive, electronics, home appliances, textiles, and construction industries — significantly increasing demand for the chemicals industry's products. Thus, the chemicals industry is under pressure to increase production capacity and diversify its product portfolio to meet a broader range of needs.

Transportation infrastructure. Currently, most imports and exports of bulk chemicals are transported by seagoing vessels, and most of the chemicals manufacturing plants in Turkey are clustered near ports. Many of the other manufacturing sectors, however, are located in inland cities, such as Eskisehir, Kayseri, and Sivas, and receive their raw materials by truck. These modes of transportation are not necessarily the most economical. Thus, to transport raw materials and finished products in the most cost-effective and least risky manner, the chemicals industry needs access to a range of transportation modes with sufficient infrastructure, including sea, rail, road, and pipelines.

Company size. Most of the companies in Turkey's chemicals industry employ fewer than 50 employees. Although these companies are highly innovative and can respond to changes very quickly, they do not have the financial resources and manpower to take on large projects.

Organized industrial zones. Turkey's chemicals industry has had difficulty establishing organized industrial zones, which require common transportation infrastructure, waste-treatment facilities, and utility systems. The main reason for this difficulty is the lack of capital investment for developing the industrial zone, including to purchase the land and to establish the utilities and transportation infrastructure. The Turkish economy experienced very

high inflation between 1980 and 2000, rendering long-term investment risky. Although the steady growth and low inflation are encouraging many companies to take a longer-term view of investments, major players in the sector continue to maintain their risk-averse perspectives (4).

Governance and clustering. Developing clusters that include all parts of a value chain within designated industrial zones would benefit the chemical process industries (CPI). In addition, governance mechanisms to take advantage of the increased competitiveness and collaboration among organizations would be helpful.

Looking ahead

Turkey's chemicals industry is positioned for steady growth. An important driver of this expected growth is the increasing domestic market. As population and per-capita income in Turkey increase, the demand for the products of the chemicals industry is expected to increase. In addition, due to Turkey's proximity to and historical ties with emerging markets in Eastern Europe, Western Asia, the Caucasian region, the Middle East, and North Africa, trade with these regions is also steadily increasing.

While the prospects are bright, realizing the potential will depend on how the industry addresses a major challenge — increasing capacity for the production of raw materials. The Turkish petrochemicals industry is heavily dependent on naphtha as a feedstock. New investments in petrochemicals should consider replacing naphtha with ethane as a raw material, since ethane enables lower-cost petrochemicals production.

The chemicals industry recently started to explore the use of biomass as a feedstock for different sectors, including the automotive, textiles, and personal-care products segments. Turkey's geography makes the country suitable for generating biomass. The industry will need to invest in the transportation and utilities infrastructure, as well as establish biomass-based research programs, to realize this potential.

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