

The following member country profile is an excerpt from Chapter 4 of the publication Energy Supply Security 2014 and is not intended as a stand-alone publication.

CHAPTER 4: Emergency response systems of individual IEA countries

The ability of the International Energy Agency (IEA) to co-ordinate a swift and effective international response to an oil supply disruption stems from the strategic efforts of member countries to maintain a state of preparedness at the national level. Energy security is more than just oil, as the role of natural gas continues to increase in the energy balances of IEA countries. The most recently completed cycle of Emergency Response Reviews (ERRs) reflected this change by assessing, for the first time, the member countries' exposure to gas disruptions and their ability to respond to such crises. This chapter provides general profiles of the oil and natural gas infrastructure and emergency response mechanisms for 29 IEA member countries.

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Key data

Table 4.27.1 Key oil data

	1990	2000	2005	2010	2011	2012	2018*
Production (kb/d)	72.5	52.8	43.5	48.3	45.6	44.9	43.4
Demand (kb/d)	477.0	662.8	647.5	649.8	655.3	670.5	745.4
<i>Motor gasoline</i>	74.0	83.6	61.9	47.3	44.9	41.2	-
<i>Gas/diesel oil</i>	153.7	184.8	216.8	300.1	310.8	327.8	-
<i>Residual fuel oil</i>	119.8	141.5	117.8	20.2	18.7	19.8	-
<i>Others</i>	129.6	252.9	251.1	282.3	280.9	281.7	-
Net imports (kb/d)	404.5	610.0	604.0	601.5	609.7	625.6	702.0
Import dependency (%)	84.8	92.0	93.3	92.6	93.0	93.3	94
Refining capacity (kb/d)	725.0	690.9	714.3	630.0	630.0	630.0	-
Oil in TPES** (%)	44	40	34	29	27	27	-

* Forecast.

** TPES data for 2012 are estimates.

Table 4.27.2 Key natural gas data

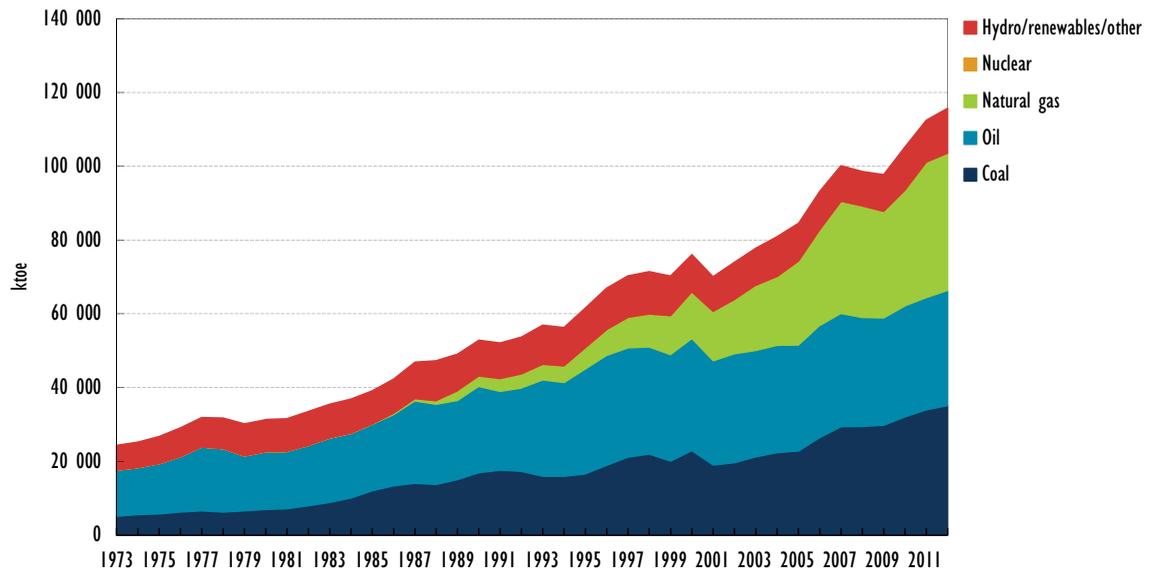
	1990	2000	2005	2010	2011	2012*	2018**
Production (mcm/y)	212	639	897	682	761	632	595
Demand (mcm/y)	3 468	14 835	27 375	38 127	44 686	45 254	59 653
<i>Transformation</i>	2 585	8 845	15 157	20 708	21 570	0	-
<i>Industry</i>	814	2 098	3 839	7 901	9 878	0	-
<i>Residential</i>	49	3 218	5 747	5 888	8 779	0	-
<i>Others</i>	20	674	2 632	3 630	4 459	0	-
Net imports (mcm/y)	3 256	14 196	26 478	37 445	43 925	44 622	59 059
Import dependency (%)	93.9	95.7	96.7	98.2	98.3	98.6	99.0
Natural gas in TPES (%)	5	17	27	30	33	32	-

* 2012 data are estimates.

** Forecast.

Note: This section on the emergency response systems of individual member countries was written by the IEA. All countries provided valuable information and comments. All opinions, errors and omissions are solely the responsibility of the IEA.

Figure 4.27.1 Total primary energy source (TPES) trend, 1973-2012



Map 4.27.1 Oil infrastructure of Turkey



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Map 4.27.2 Gas infrastructure of Turkey



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Country overview

Oil has been one of the main energy sources in Turkey, accounting for 27% of the country's total primary energy supply (TPES) in 2012. Turkey's oil demand increased slightly from 637 thousand barrels per day (kb/d) in 2003 to 670 kb/d in 2012, although in 2009 it dropped down from 678 kb/d to 650 kb/d in 2010. The transport sector accounted for half of total oil consumption in 2011. Domestic oil production is in decline in Turkey, amounting to 45 kb/d or about 7% of total demand in 2012.

In 2012, Turkey imported 712 kb/d, consisting of about 392 kb/d of crude oil and some 320 kb/d of refined products. Iran was the largest supply source of crude oil with 39% of the 2012 total, followed by Iraq (19%), Saudi Arabia (15%) and Russia (11%). Crude oil and petroleum products are mainly delivered by tankers and two major international pipelines running through the country with a total annual handling capacity of 2.8 million barrels per day (mb/d). There are four operational refineries with a total crude distillation capacity of around 610 kb/d in the country.

Turkey meets its 90-day stockholding obligation to the International Energy Agency (IEA) by placing a minimum stockholding obligation on industry. Under the relevant acts, refineries and fuel distribution companies are obliged to hold at least 20 days of product stocks based on the average daily sales of the previous year, while eligible consumers who use more than 20 000 tonnes annually are required to hold 15 days' consumption of each type of liquid fuel.

Turkey held some 63 mb of oil stocks at the end of April 2013. Around 56% of total oil stocks are held in the form of crude oil. The use of emergency oil stocks is central to Turkey's emergency response policy, which can be complemented by demand restraint measures.

The share of natural gas in the country's TPES significantly increased to 32% in 2012. Turkey's gas demand significantly increased from 0.7 bcm (2 mcm/d) in 1987 to 45.3 bcm (124 mcm/d) in 2012, while indigenous natural gas production totalled some 0.63 bcm in the same year. The transformation sector was the largest consumer of natural gas in 2011, representing about 48% of the country's total gas consumption.

The Russian Federation was Turkey's largest supplier, representing 58% of total imports in 2012. Turkey has four international gas pipelines in operation with a total import capacity of some 46.6 bcm, and it plans to diversify its natural gas import pathways by constructing new major cross-border pipelines and liquefied natural gas (LNG) terminals.

Key elements of Turkey's overall gas security policy are diversifying its long-term supply contract portfolio, forming an energy hub from Central Europe and the Middle East to Europe, increasing natural gas storage facilities, cutting back contractual supplies and fuel switching to alternative fuels for power generation. Gas importers are obliged to hold a gas storage capacity corresponding to 10% of their annual gas import. The country has also planned to oblige all power plants with fuel-switching capacity to hold sufficient amounts of secondary fuel such as diesel.

In the event of a crisis, the transmission system operator (TSO), BOTAŞ, would take the lead under the supervision of the Energy Market Regulatory Authority. In case of a gas supply disruption in which the responsible gas suppliers are not identified, the TSO will endeavour to curb gas consumption by reducing the contractual capacities of interruptible contracts and gas-fired power plants which can switch to alternative fuels.

Oil

Market features and key issues

Domestic oil production

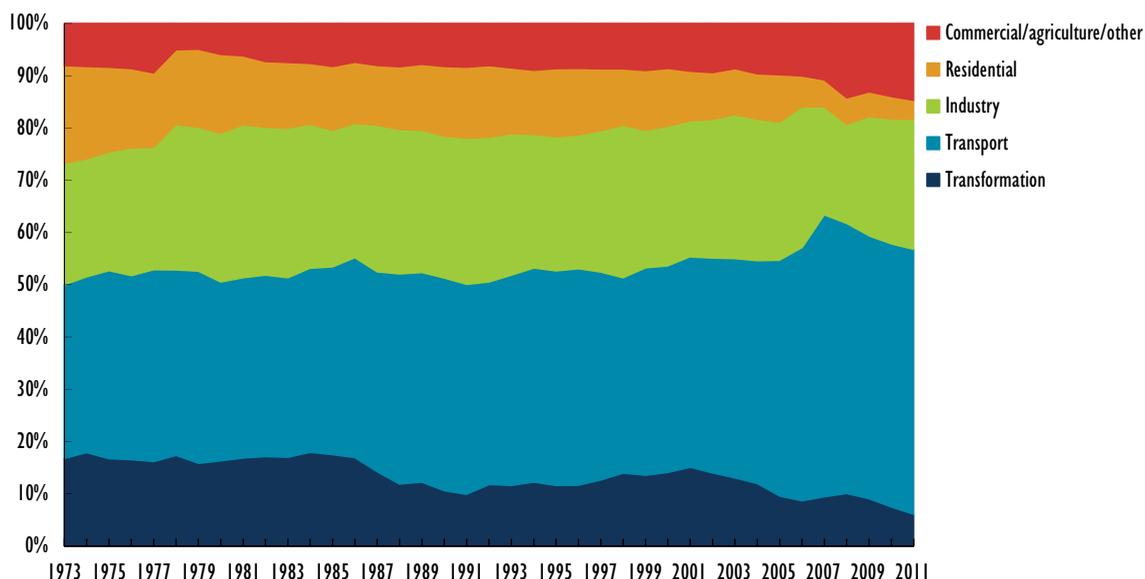
In 2012, Turkey produced 45 kb/d of crude oil; this was equivalent to some 7% of its total consumption. Around 50 upstream companies were granted exploration and production licences in 2012. About 75% of exploration areas are covered by Turkish Petroleum Company (TPAO). The industry estimates that unless new abundant oil fields are discovered, crude oil production will decrease to 12 kb/d by 2030.

Oil demand

Turkey's oil demand slightly increased from 637 kb/d in 2003 to 670 kb/d in 2012, although it dropped from 678 kb/d in 2009 to 650 kb/d in 2010.

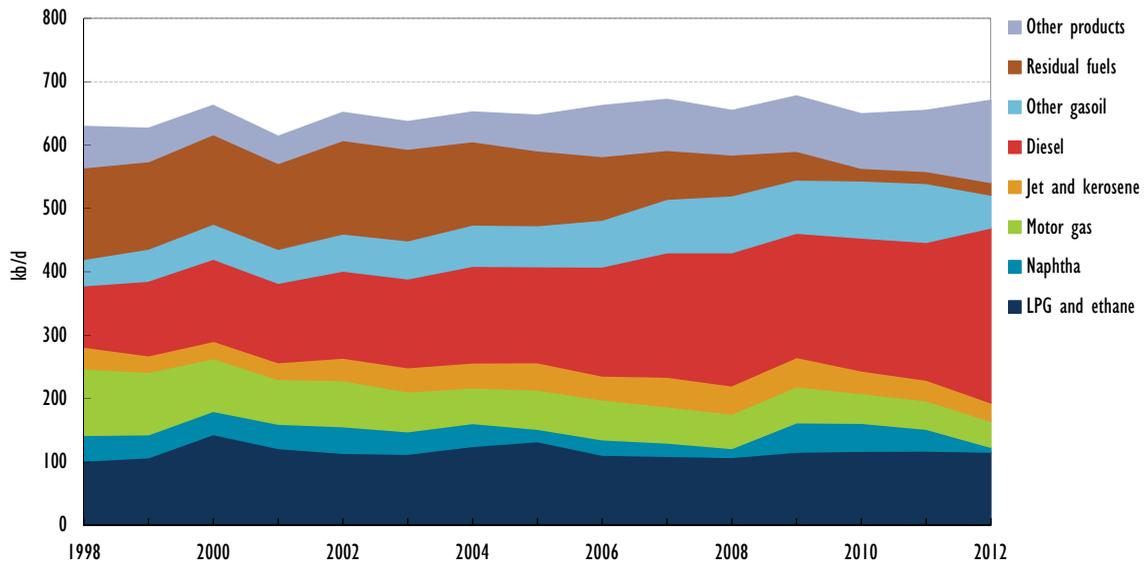
In 2011, around 51% of Turkish total oil demand was consumed by the transport sector, while the industry sector and the commercial/agriculture/other sector accounted for 25% and 15% respectively. Relatively high oil demand in the industry sector is driven by the construction sector (around 43% of the industry share) and the chemical sector (23%).

Figure 4.27.2 Oil consumption by sector, 1973–2011



Turkey's demand for diesel almost doubled from 2003 to 2012 whereas demand for gasoline decreased by 34%. Demand for heating oil/other gasoil also increased during the same period. Demand for residual fuels dropped significantly by 86%. The Turkish Petroleum Industry Association (PETDER) forecasts that consumption of gas oil will significantly increase from 2010 to 2020 at a compound annual growth rate of around 3.7%.

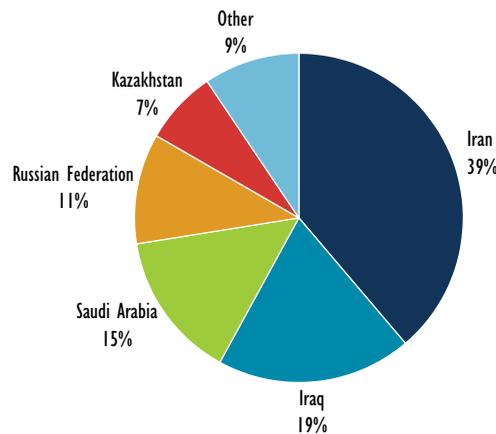
Figure 4.27.3 Oil demand by product, 1998-2012



Imports/exports and import dependency

In 2012, Turkey's oil imports in 2012 were about 712 kb/d, consisting of 392 kb/d of crude oil and 320 kb/d refined products. Iran was the largest supply source of crude oil with 39% of the 2012 total, followed by Iraq (19%), Saudi Arabia (15%) and Russia (11%). In 2012, refined product imports came from Russia (19%), Italy (12%), Greece (9%) and India (8%).

Figure 4.27.4 Crude oil imports by origin, 2012



Oil company operations

TPAO, a state-owned company, is the country's main domestic crude oil producer, covering about 75% of total domestic production in 2011. In 2012, 50 companies were licensed to conduct exploration and production activities. Half of these were foreign-capitalised companies.

TÜPRAŞ, the country's largest industrial company, operates four refineries, while two other refineries are being constructed by Star Refining and Eastern Mediterranean (Doğu Akdeniz) Refinery.

In 2011, 49 distributors operated 12 441 filling stations in the country. There are also 70 liquefied petroleum gas (LPG) distributing companies running 9 663 LPG autogas stations.

Oil supply infrastructure

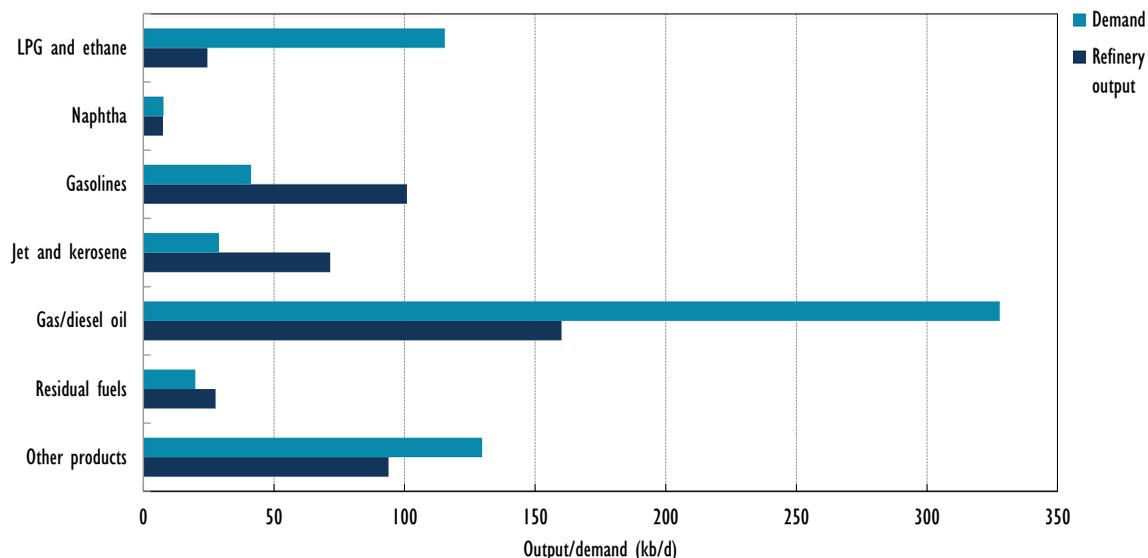
Refining

Turkey's four operating refineries have a total crude distillation capacity of around 610 kb/d. All four are owned by TÜPRAŞ. Three refineries in Izmit, Izmir and Kırıkkale are medium complex refineries, while the Batman Refinery is a simple refinery with atmospheric and vacuum crude units; the refinery is located close to the crude oil production area in southeastern Turkey.

In 2011, TÜPRAŞ processed 13 types of crude oil from nine countries; their gravities ranged between 23 API and 45 API with a sulphur content between 0.6% and 4.1%. Almost 65% of crude oil processed in the country was medium and heavy sour crude in 2011, followed by heavy sour (28%) and light sweet (7%).

Two refineries are under construction or planned: one refinery in Izmir to be run by Star Refining, is expected to be operational by 2015, while Eastern Mediterranean (Doğu Akdeniz) Refinery is carrying out a feasibility study for another refinery in Adana. When construction of these two refineries is completed, the country's total crude distillation capacity will rise to 1.1 mb/d with a new distillation capacity of around 510 kb/d.

Figure 4.27.5 Refinery output vs. demand, 2012



In 2011, the total crude throughputs averaged 413 kb/d. The total utilisation rate of the four refineries is around 75%: Izmit (82%), Izmir (73%), Kırıkkale (59%) and Batman (86%). In 2012, the refined product output totalled 486 kb/d. The main products of those refineries were gas/diesel oil (33%), which was followed by gasoline (21%), kerosene (15%), residual fuel oil (6%) and LPG (5%).

In 2012 domestic production of gas/diesel oil was able to meet 52% of domestic oil use, while LPG and ethane amounted to some 21% of domestic demand.

Ports and pipelines

Imports of crude oil and petroleum products are mainly by pipeline and tanker. While Izmit refinery and Izmir refinery import crude oil by tanker, crude oil is delivered to the Kırıkkale Refinery and the Batman Refinery by pipeline.

The country has almost a dozen important oil ports: Antalya, Mersin-Ataş, Trabzon, Hopa, Izmir/Aliağa, Gemlik, Tekirdağ, Izmit, Iskenderun, Zonguldak and Istanbul. In 2011, the country's handling capacity at ports totalled 5.9 mb/d.

Two major international pipelines run through Turkey: Kirkuk-Ceyhan Pipeline and Baku-Tbilisi-Ceyhan Pipeline. There are also three domestic pipelines: Ceyhan-Kırıkkale Crude Oil Pipeline, Batman-Dörtyol Crude Oil Pipeline and Şelmo-Batman Crude Oil Pipeline. The total length of crude oil pipelines in the country is about 3 374 km with a combined handling capacity of about 2.8 mb/d in 2012.

Kirkuk-Ceyhan Crude Oil Pipeline runs from Kirkuk, Iraq, to the Ceyhan Oil Terminal on the Mediterranean Sea and has been active since 1976. A second pipeline parallel to the first was commissioned in 1987, which carries a total maximum annual capacity of 1.4 mb/d. In September 2012, Iraq and Turkey agreed to extend the carriage of Iraqi crude oil import through the pipeline by 15 years. In 2011, this pipeline brought 163.3 mb of crude oil from Iraq to Turkey.

The Baku-Tbilisi-Ceyhan Crude Oil Pipeline has been in operation since 2006. This pipeline carries crude oil from the Caspian region, from Baku to Ceyhan via Georgia. It has a total length of 1 760 km. The original capacity of the pipeline was 1 mb/d, but at present 1.2 mb/d can be transported with the aid of drag-reducing agents. There is also a plan to expand the capacity to 1.6 mb/d. In 2011, this pipeline brought 257.2 mb of crude oil from the Caspian Sea to Turkey.

Among Turkey's domestic pipelines, Ceyhan-Kırıkkale Crude Oil Pipeline has a maximum capacity of 135 kb/d, running from Ceyhan to Kırıkkale Refinery. In 2011, this pipeline carried around 20 mb of crude oil. Batman-Dörtyol Crude Oil Pipeline, with a capacity of 86.4 kb/d, aims to transport crude oil produced in the southeastern Anatolia region to the Dörtyol Marine Terminal. Around 10 mb of crude oil was brought through this pipeline in 2011. The Şelmo-Batman Crude Oil Pipeline has a capacity of 16 kb/d to transport crude oil produced in the Şelmo area to the Batman Terminal; this pipeline has not been in operation since 2008.

Turkey also plans to construct a pipeline from Samsun on the Black Sea to Ceyhan with a capacity of some 1.1 mb/d, which could be expanded to 1.5 mb/d. This pipeline will help to reduce increasing tanker traffic in the Turkish Straits.

Storage capacity

Total storage capacity in Turkey is estimated at some 79 mb (12.5 mcm). Most storage facilities are located in the regions bordering the Sea of Marmara, the Aegean Sea and in Central Anatolia where the refineries are located, as well as in the region bordering the Mediterranean Sea which includes the Ceyhan Oil Terminal. At the end of 2011, around 44% of total storage capacity was owned by TÜPRAŞ, Turkey's largest industrial enterprise, followed by fuel distributors (37%), BOTAŞ (18%) and TPAO (1%). Construction of new refineries will add 18.9 mb (3 mcm) of storage capacity, while the Samsun-Ceyhan oil pipeline project plans to construct 14 oil tanks amounting to 13.2 mb (2.1 mcm). With the completion of these two new infrastructure projects, the total storage capacity of the country will be expanded to over 110 mb (17.5 mcm).

Decision-making structure

The National Oil Stock Commission (NOSC) is responsible for energy security in the event of supply disruption. The commission is chaired by the Undersecretary of the Ministry of Energy and Natural Resources (MENR) and is composed of the Undersecretary of the Treasury and representatives from the Ministry of National Defence, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Interior Affairs, the Energy Market Regulatory Authority (EMRA), and the General Directorate of Petroleum Affairs (GDPA). The MENR and the GDPA serve as the secretariat and form the core of the Turkish national emergency strategy organisation (NESO). The Petroleum Market Law provides the legal basis for establishing the NESO.

During an emergency, the chairman of the NOSC will convene a meeting with the commission members to make a decision to release compulsory industry stocks, which is estimated to be taken within two days. Decisions of the NOSC will be implemented by the GDPA in close co-operation with the industry.

Stocks

Stockholding structure

Turkey meets its stockholding obligation to the IEA by placing a minimum stockholding obligation on industry. According to the Petroleum Market Law, the country should hold oil stocks equivalent to at least 90 days of its net imports.

Refineries and fuel distribution licensees are obliged to hold at least 20 days of product stocks based on the average daily sales of the previous year. These stocks must be held at their own storage or licensed storage facilities. New entrants into the distribution market are obliged to hold a minimum of 3.3 kilotonnes of stock. Eligible consumers who use more than 20 Kt on an annual basis are also obliged to hold 15 days' consumption of each type of liquid fuel in their consumption inventory. In addition, refineries are asked to hold, on behalf of the government, complementary stocks which correspond to the remaining balance of 90 days of net oil imports. However, the complementary stocks are not yet in place, although refineries usually hold a quantity of commercial oil stocks beyond the amount requested as complementary stocks. The draft Law on Complementary Oil Stocks is expected to ensure that the complementary stocks are held in an appropriate manner.

Crude or products

At the end of April 2013, Turkey held some 63 mb of oil stocks, equal to 93 days of 2012 net imports. Around 56% of total oil stocks are held in the form of crude oil, as refineries are permitted to hold crude oils in place of gasoline and diesel on the condition that they report the amount and the type of substitution. Middle distillates account for 21% of the country's total stocks, followed by motor gasoline (5%).

Location and availability

Since Turkish legislation does not allow emergency oil reserves to be held abroad, Turkey has no bilateral agreements or ticket arrangements with other countries. All emergency oil stocks are held in the country.

Although compulsory stocks are commingled with commercial and operational stocks in storage, emergency oil stocks are considered to be held on top of the minimum operating requirements (MOR) of the industry.

Monitoring and non-compliance

The EMRA conducts regular on-site audits of randomly selected facilities twice a year to monitor the physical availability and quality of compulsory stocks. These audits are carried out in co-operation with the Ministry of Science, Industry and Technology. Technical requirements are also tested on site by individual experts.

In cases of failure to comply with stock obligations in terms of quality, quantity and location of oil products, companies can be obliged to pay fines, and, in case of serious infringement, the licence of the company may be cancelled.

Stock drawdown and timeframe

The Petroleum Market Law requires a decision by the NOSC to draw down compulsory industry stocks during an oil supply disruption. Based on the decision taken by the NOSC, the GDPA will request industry, according to their obligation, to release the necessary oil stocks in close co-operation with the EMRA. Stock release will most likely be made by refineries. The government's decision could be made in two days and release of stock is estimated at three days.

Financing and fees

The government does not provide financial support for building compulsory industry stocks. All refineries, distributors and eligible consumers must self-fund the operational costs of meeting their emergency requirements. These costs are implicitly passed on to final consumers in market prices.

Other measures

Demand restraint

Demand restraint is considered a secondary emergency response measure that could complement an oil stock release in Turkey.

Turkey's demand restraint measures would range from light-handed measures (e.g. information and energy saving campaigns) on a recommendation basis, to heavy-handed measures (e.g. mandatory speed limits, a ban on weekend driving and short distance driving, temporary restrictions on heating for houses and public buildings under 15 °C, restriction on the lighting of shop windows, prohibition of motor sports, introduction of delivery quotas of gasoline, tax increases and rationing) which would be deployed only in case light-handed measure are not enough to reduce oil consumption.

The decision to implement demand restraint measures will be taken by the Co-ordination Board, established under the Law on Organisation and Duties of Headship of Disaster and Emergency Management in 2009. The Co-ordination Board will be advised by the NOSC. Approval by parliament is required for implementation of tax increase and rationing/allocation measures. Local governors are asked to implement demand restraint measures which the Co-ordination Board decides according to the severity of the crisis.

Fuel switching

Short-term fuel switching from oil to other fuels is not regarded as an emergency response measure in Turkey, as the share of oil in the power generation sector was estimated to be only some 1% in 2012. There is little potential to switch away from oil to other energy sources in this sector.

Other

According to the Petroleum Law, the administration can ask producing companies to increase oil production. Domestic production surge is estimated to be a 5% to 10% increase of production for 10 days in time of crisis. However, it is too little to cover domestic oil demand since the country's annual crude oil production was around 45 kb/d in 2012.

Gas

Market features and key issues

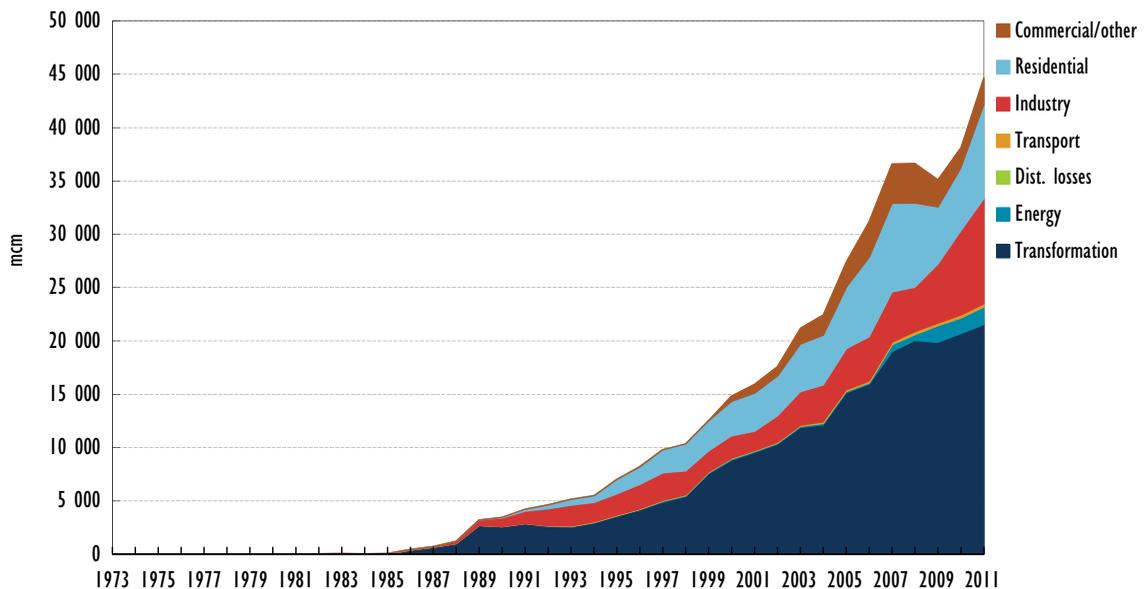
Gas production and reserves

In 2012, indigenous natural gas production totalled some 0.63 bcm. Gas production is projected to be depleted.

Gas demand

Turkey's demand for natural gas significantly increased in 2012 from some 0.7 bcm (2 mcm/d) in 1987 to around 45 bcm (124 mcm/d).

Figure 4.27.6 Natural gas consumption by sector, 1973–2011



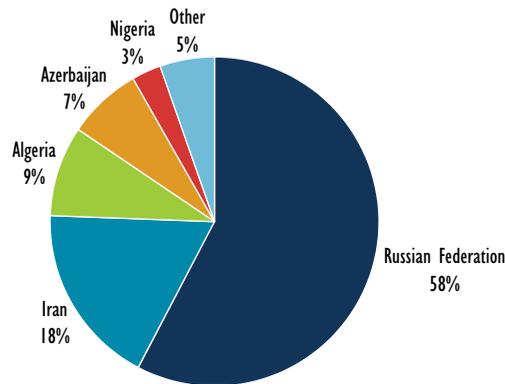
In 2011, the transformation sector was the largest consumer of natural gas, representing about 48% of Turkey's total gas consumption, while the industry and the residential sector represented 22% and 20% respectively. The Turkish monthly peak gas demand stood at some 5.2 bcm in January 2012. Daily peak demand was recorded in the same month, amounting to around 186 mcm/d.

Given that electricity demand is estimated to increase by 7.5% annually until 2020, gas demand may rise at a significant rate despite efforts to promote non-fossil fuels for electricity generation. In 2012, natural gas accounted for some 44% of total electricity generation.

Gas import dependency

Because of its limited indigenous natural gas production, Turkish gas demand is mostly supplied by imports through pipelines or in the form of LNG. The country's total natural gas imports in 2012 amounted to some 46 bcm (125.8 mcm/d).

Figure 4.27.7 Natural gas imports by source, 2012



In 2012, Russia was Turkey's largest supplier, representing 58% of total imports, followed by Iran (18%), Algeria (9%) and Azerbaijan (7%). Most natural gas is carried through international pipelines from Russia, Iran and Azerbaijan. Natural gas from Algeria and Nigeria is imported in the form of LNG. Turkey's natural gas imports are dependent on long-term contracts.

Gas company operations

The gas market was liberalised in May 2001, with the Natural Gas Market Law N° 4646 which obliges state-owned BOTAŞ to reduce its market share in imports, wholesale and distribution. However, BOTAŞ still remains a dominant gas market player. Some 39 bcm of natural gas were imported by BOTAŞ in 2011, while about 5 to 6 bcm were imported by private gas importers. In 2012, the amount of gas imported by BOTAŞ was 43.1 bcm.

At the end of 2011, there were some 9.1 million contracts when residential gas consumption reached 11.3 bcm.

Gas supply infrastructure

Ports and pipelines

The transmission division of BOTAŞ is Turkey's national TSO. The transmission system has approximately 9 555 km of pipeline within Turkey. With the inclusion of the distribution grid, the total length of the gas grid is around 12 290 km. The country has nine entry points: four points through international pipelines, two LNG terminals, two domestic production areas and one storage facility.

The system comprises seven gas compressor stations with a total compressor capacity of 250 MW and over 200 pressure-reducing and metering stations. As the country faces difficulty in transferring imported gas from east to northwest with its current compression capacity, two new compressor stations with a capacity of 98 MW are expected to be integrated into the transmission system. Turkey has 290 primary exit points: 53 points are operated by the BOTAŞ transmission division, while 237 entry points are operated by distribution companies.

There are four international gas pipelines in operation with a total import capacity of some 46.6 bcm (around 127.6 mcm/d or 5.3 mcm/h): the Russia-Turkey West Gas Pipeline with a capacity of 16 bcm via Kofcaz on the border with Bulgaria; the Russia-Turkey Blue Stream Natural Gas Pipeline with a capacity of 14 bcm via Samsun on the Black Sea; the Iran-Turkey Pipeline with a 10 bcm capacity via Dogubayazi close to the border with Iran; and the Baku-Tbilisi-Erzurum Pipeline with a capacity of 6.6 bcm through Georgia via Ardahan. The country also exports natural gas to Greece through a pipeline with a maximum capacity of 2.4 mcm/d.

Turkey is engaged in the Trans-Anatolian Natural Gas Pipeline (TANAP) project to transport natural gas from the Shah Deniz field in Azerbaijan to Europe through Turkey with a capacity of 16 bcm; 6 bcm of this amount is expected to be imported for Turkish domestic gas use with the remaining 10 bcm destined for Europe.

As an important transit country, Turkey also participates in other international pipeline projects: the Arab National Gas Pipeline will bring Egyptian gas to Turkey and Europe through Jordan, Lebanon and Syria; Turkmenistan-Turkey-Europe Natural Gas Pipeline will transport 30 bcm of Turkmen gas to Turkey (16 bcm) and Europe (14 bcm); and the Iraq-Turkey Natural Gas Pipeline project is planned for construction in parallel with the existing Kirkuk-Ceyhan Crude Oil Pipeline.

Turkey has two LNG regasification terminals with a total maximum annual capacity of around 14 bcm. BOTAŞ owns the Marmara Ereğlisi LNG Terminal which has a maximum send-out capacity of some 22 mcm/d. Ege Gaz operates the Aliaga Terminal with a capacity of 16.4 mcm/d. A construction project for a new LNG terminal, which is expected to have a capacity of 18 mcm/d, is under evaluation.

Storage

Turkey has around 3 bcm of storage capacity in total, with a sending-out capacity of some 58.5 mcm/d. As this is not sufficient to meet its increasing gas demand, in 2008 the Strategic Plan of the MENR set a target to increase gas storage capacity to 4 bcm by the end of 2014.

In 2012, Turkey had 2.66 bcm of underground storage at two depleted gas fields close to Istanbul for seasonal balancing, peak shaving and gas supply shortage. TPAO operates those storage facilities with an injection capacity of 16 mcm/d and a withdrawal capacity of 20 mcm/d in total. The storage capacity of the facility is expected to be expanded to reach 2.84 bcm with a withdrawal capacity of 25 mcm/d in the second phase of construction by the end of 2014, and then 4.3 bcm with a withdrawal capacity of 70 mcm/d in the revised phase III by 2017.

Several projects are ongoing: one is the Tuz Gölü (salt lake) natural gas storage project in the Central Anatolia region. The first phase, which includes the construction of six domes is planned for completion in 2015-16; the second phase in 2018-19 will increase the facility by an additional six units.

BOTAŞ also operates three LNG storage tanks with a total capacity of 255 000 m³ of LNG or 156.8 mcm of natural gas in Marmara Ereğlisi; Ege Gaz owns 280 000 m³ of LNG storage (or 172.2 mcm of natural gas) in Aliaga.

Emergency policy

Key elements of Turkey's overall gas security policy are diversifying its long-term supply contract portfolio, forming an energy hub from Central Europe and the Middle East to Europe, increasing its natural gas storage facilities, cutting back contractual supplies and installing voluntary fuel switching to alternative fuels in power generation.

The Natural Gas Market Law N° 4646 (2001) sets the standard of gas supply security for suppliers. Gas importers (except spot LNG importers) are obliged to hold gas in storage to a capacity corresponding to 10% of their annual gas imports, although they are not necessarily asked to hold such an amount of natural gas in storage. In light of the law, the Transmission Network Operation Principles (network code) was approved by the EMRA to regulate the operation of the TSO and the companies involved, such as distributors and importers in the event of a natural gas shortage. According to the code, BOTAŞ transmission division would take the lead in the event of a supply disruption under the supervision of the EMRA.

In 2011, the Minister of Energy and Natural Resources approved an action plan on additional contingency measures. Under the action plan, the Commission for Enduring and Supervising Security of Natural Gas Supply, CESS-NGS, was established with the participation of the Undersecretary of the MENR (chairperson), the EMRA, the General Directorate of Energy Affairs of the MENR, the Turkish Electricity Transmission Corporation (TEİAŞŞ), the state-owned Electricity Generation Company (EÜAŞ), the Turkish Electricity Trading and Contracting Company (TETAŞ) and BOTAŞ. The CESS-NGS plans to amend the National Gas Market Law in order to oblige all power plants with fuel-switching capacity to hold sufficient amounts of secondary fuel such as diesel. It is also planned that all periodic maintenance is to be kept at minimum levels during the winter months.

Emergency response measures

Using an electronic bulletin board, the TSO announces “difficult days” when heavy imbalances in the system occur, caused by excessive withdrawals or insufficient gas entries. Suppliers are requested to implement disruption and interruption orders from the TSO within 8 hours.

When the gas importers concerned can be identified, gas supplies can be curtailed in accordance with the end-user priority list which is submitted by gas importers every year.

In case of gas supply disruption in which the gas suppliers responsible are not identified, the TSO will first endeavour to curb gas consumption by implementing interruptible contracts. However, the share of such contracts with BOTAŞ is limited to around 1.4% of its total sales, because prices between normal contracts and interruptible ones make no significant difference.

The TSO will also reduce the contractual capacities of gas-fired power plants which can switch to alternative fuels, and then cut gas supplies to other power plants. The total amount of dual-fired power generation was around 3.5 GW (or some 8.4 mcm/d at net caloric value), with most generating electricity for their own facilities.

When the above measures are not considered sufficient to mitigate the impact of a gas disruption, the TSO will reduce gas supplies to industry and eventually to households.