

Introduction: Turkmenistan's Oil and Gas Industry

The oil and gas industry is the backbone of the economy of Turkmenistan and the driving force for the country's economic growth and development. Exports of crude oil petroleum products are the main source of income and foreign currency for the country.

The gas industry of Turkmenistan, the recipient of intensive development programs during the Soviet period, holds the dominant position in the oil and gas sector. According to an appraisal by BP Statistical Review of World Energy 2011, proven reserves of gas in Turkmenistan are 11.7 percent of proven reserves worldwide.

Turkmenistan's gas production accounts for 1.2 percent of the gas produced worldwide. In the countries of the former Soviet Union it ranks second to Russia.

Table 1-1. Comparison of reserves and production of liquid hydrocarbons and natural gas in Turkmenistan, Azerbaijan, Kazakhstan, Russia and Uzbekistan

	Proved reserves		Production		Gas export
	Oil, billion tons	Gas, tcm	Oil, million tons	Gas, bcm	bcm
Azerbaijan					
Kazakhstan					
Russia					
Turkmenistan					
Uzbekistan					

** excludes exports of Central Asian gas*

Source: BP Statistical Review of World Energy 2011, National statistics agencies, RPI estimates

Compared to other Central Asian states, Turkmenistan pursues, perhaps, the most ambitious strategy for developing its oil and gas sector. The Oil and Gas Development Program Until 2030, approved by People's Council in October 2006, envisages manifold increase in oil and gas production, production of refined products as well as export of feedstock and final products.

In particular, Turkmenistan's Oil and Gas Development Program Until 2030 provides for the following:

- oil production to increase up to XX Mt.
- gas production to increase up to XX Bcm.

- 2D seismic surveys to cover XX km.
- 3D seismic surveys to cover XX km²
- drilling to cover XX m.
- foreign investment in PSA projects to total \$XX billion.
- oil production under PSA projects to total XX Mta (45% of total production).
- gas production under PSA projects to total XX Bcma (30.8% of total production).

Unlike Saparmurat Niyazov, under whose rule the Turkmen Government relied on using the production and transport facilities inherited from the Soviet Union and focused on solving the issue of “how and who to sell natural gas to”, Gurbanguly Berdymukhamedov, as he came to power, made Ashgabat's priority the issue of “how to produce natural gas”.

While Turkmenistan is currently short of financial resources, technology and skilled labor to develop new fields, the old Soviet fleet and facilities can no longer supply the existing demand.

To achieve the goals set by the Government, the industry needs significant investments in the following:

- development of promising oil areas and fields in the South West of Turkmenistan as well as Turkmenistan's sector of the Caspian Sea, the Amudarya river basin and other promising regions in the republic;
- build-up of the resource base through developing hard-to-recover hydrocarbon reserves and enhancing their recovery rate.
- broad application of international state-of-the-art technologies (such as horizontal and radial drilling, enhanced recovery, 3D seismic surveying, nanotechnology etc.).

Table 1-2. Key provisions of development program for Turkmenistan's oil and gas industry through 2030

	2011	2015	2020	2030
Gas, bcm				
-production				
-export				
Oil, million ton				
-production				
-export				
Oil processing, million tons				

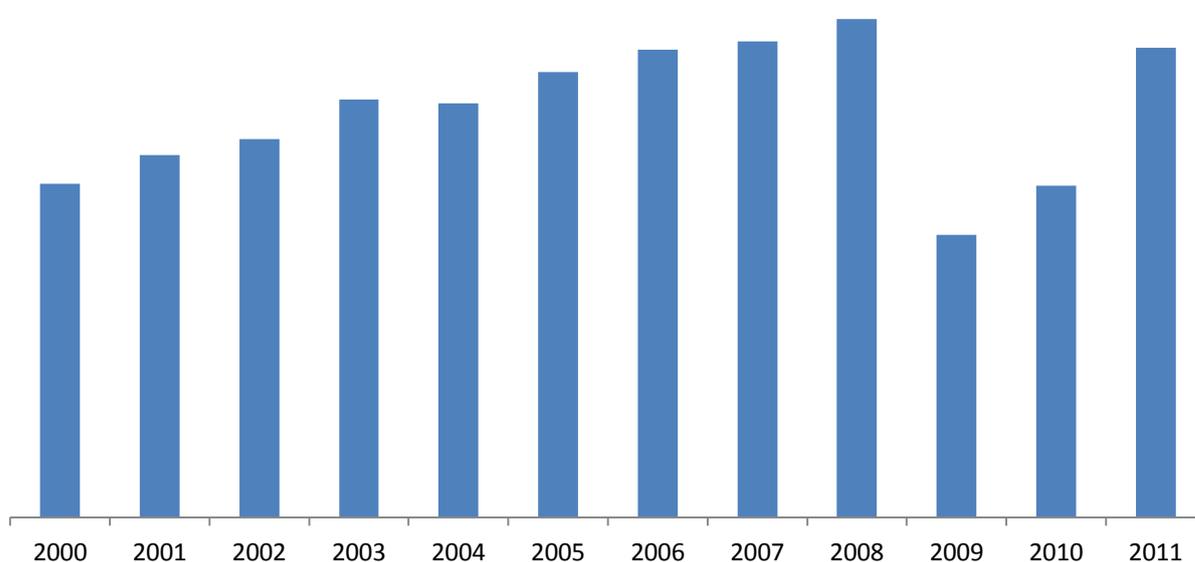
Source: Government of Turkmenistan

1.1 Oil Production

The highest level of oil and condensate production – 15.5 million tons – in Turkmenistan during the Soviet era was reached in the mid 1970s. Crude production gradually decreased over the next two decades and then dropped significantly after the collapse of the USSR.

The lowest production level of 4.55 million tons was recorded in 1993. In the middle of the last decade the industry managed to recover and to reach, in 2003, the production level of 10 million tons per annum (MMta). The growth period gave way to a recession in 2005-2006 but in 2007-2008 the growth was resumed. In 2009-2010 oil production decreased again, but XX Mt of oil was produced in 2011 which is a XX% increase as compared to 2010.

Chart 2-1. Oil production in Turkmenistan in 2001-2011, thousand tons



** Data for Turkmenneft includes oil production at the Khazar project, which Turkmenneft, the project's operator, included in its reports*

Source: Ministry of the Oil and Gas Industry and Mineral Resources of Turkmenistan

1.2 Oil Refining

Crude oil is refined in Turkmenistan at two plants: the Turkmenbashi (formerly Krasnovodsk) and Seidi oil refineries located in the western and eastern parts of the country, respectively.

The country's main producer of petrochemical products is the Turkmenbashi oil refinery complex located by the Caspian coast. The complex was built during the second world war (it was put into operation in 1943), and has been in different phases of reconstruction and modernization since the late 1990s.

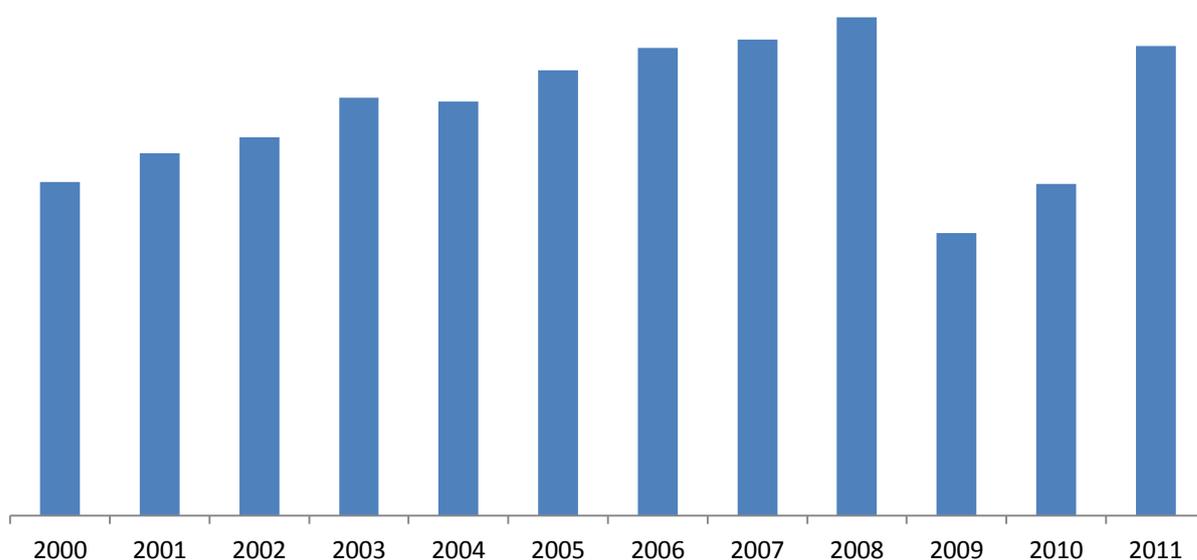
The first stage of reconstruction of the Turkmenbashi oil refinery complex took place from 1999 to 2004, with a total cost of \$1.6 billion. In fact, a new integrated petrochemical plant was established that replaced the previous enterprise. Oil refining capacity grew by 2 million tons and reached the design level of 6 million tons per year, oil processing depth (conversion factor) grew from 64% to 82%. Production of

motor fuels more than doubled to reach 1.7 million tons; output of jet fuel, diesel, LPG and kerosene increased substantially: production of such new products as high-octane gasoline, hydrotreated diesel oil, polypropylene, sulfur and various types of lubricants, including motor oils (16 grades), industrial (5), transmission (4), hydraulic and turbine was launched.

About twenty foreign companies participated in the first stage of the reconstruction and modernization of the complex including Emerol (Ireland), Foster Wheeler Italiana S.p.a., Gama Industry (Turkey), Itochu Corp., Chiyoda, Nissho Iwai, Marubeni Corp. (all Japan), Merhav (Israel), National Iranian Oil Engineering & Construction Company (NIOECC), Technip (France, Germany), UOP Foxboro (USA).

As of the end of 2011 the capacity of the enterprise was XX mln. tons. In June 2012 Gurbanguly Berdimukhamedov ordered the start of the second stage of refurbishing of the Turkmenbashi oil refinery complex. The program is aimed at bringing the amount of scope of oil refined to XX mln. tons per annum and raising the conversion ratio to XX% and bringing the quality of motor gasoline to EC standards.

Chart 2-12. Primary oil refining in Turkmenistan, mln. tons per annum



Source: Ministry of the Oil and Gas Industry and Mineral Resources of Turkmenistan

2 Turkmenistan's Gas Industry

2.1 Brief History

Gas production in Turkmenistan started in the 1960s. During the next two decades, the Turkmen gas industry grew rapidly and the republic became the second largest gas producer in the former USSR after Russia.

About 99 percent of all gas produced in the Turkmen Soviet Socialist Republic was produced by the Turkmengasprom All-Union Industrial Association. The association was created after the Odzhak field was discovered in February 1966 in the south-eastern part of the republic. In November 1966, eight months after the field was discovered, gas was first transported from the field to Russian industrial centers through the Bukhara-Urals gas pipeline.

The discovery of the Kukurtly, Naip, Eastern and Western Shatlyk fields between 1968 and 1970 were important stages in the development of the Turkmen gas industry. After the Shatlyk field was brought onstream, gas production in the republic doubled.

Gas production increased further after the Dovletabad field was discovered (1974) and brought onstream (1983). Its recoverable resources exceeded 1.6 trillion cubic meters. Gas production began in the Uchadzhi, Seirap and Shorkel fields in 1984 and in the Malai and Samandepe fields in 1986, raising annual gas production to 85.5 bcm by 1989.

Table 3-1. Initial reserves of Turkmenistan's key fields put into production during the Soviet period

Field	Initial reserves (ABC1), bcm
Dovletabad	
Malai	
East and West Shatlyk	
Samandepe	
Naip	
Kerpichly	
Kukurtly	

Source: Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan

However, since 1992 gas production decreased steadily until it leveled off just above 13 bcm in 1998. The main reasons for such a severe production slump were a reduction and then complete cessation of gas supplies from Turkmenistan to the former Soviet republics, primarily to Ukraine, plus the absence of direct gas export routes to European markets bypassing Russia.

Historically, Turkmenistan's gas was integrated into the Soviet Union's gas balance, comprising a large share of Ukraine's consumption. In addition, Turkmenistan had an annual quota of 11 bcm as part of Soviet exports to the European market.

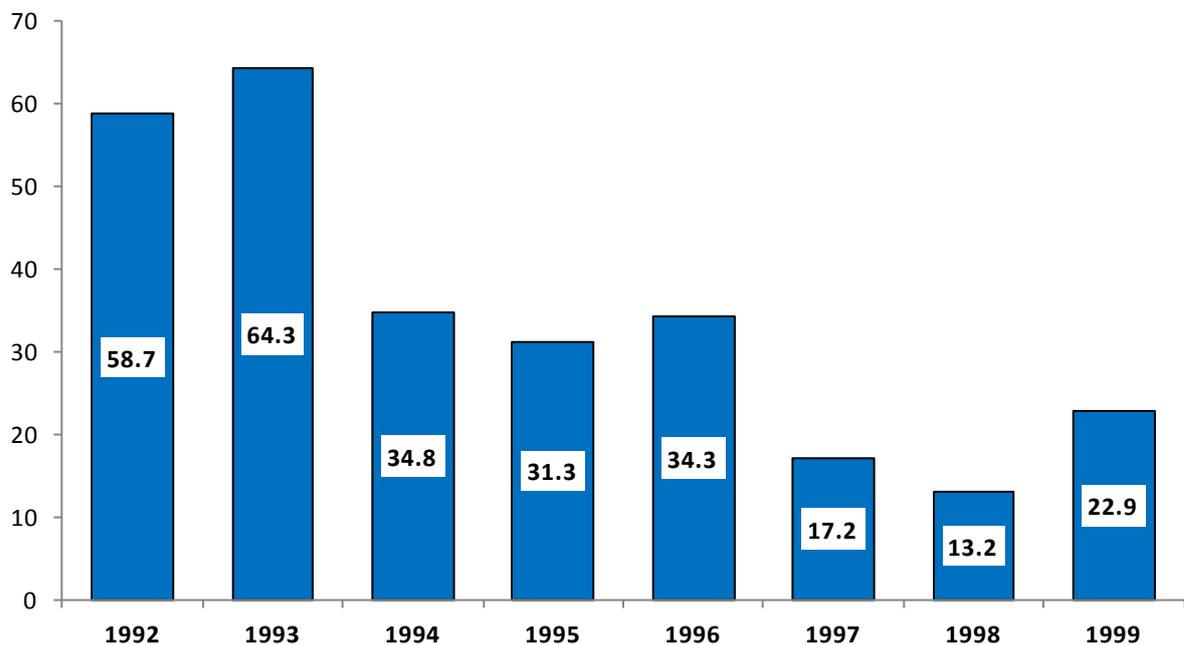
In 1994 Russia cancelled Turkmenistan's export quota to Europe, leaving it with deliveries to the markets of Ukraine and other former Soviet republics. As the debts incurred by those countries for gas supplies grew, Ashgabat had to cut and then suspend deliveries to those countries.

In November 1995 the Turkmenrosgas Joint-Stock Company (51 percent owned by Turkmenistan, 45 percent by Gazprom, 4 percent by ITERA) was founded and in 1996 it assumed responsibility for marketing all gas exported from Turkmenistan. However, this did not help resolve the problem of non-payments. Unsatisfied with Turkmenrosgas' performance, Turkmenistan's government terminated its activities, which led to a collapse in gas exports to 6.5 bcm in 1997 (for comparison, equal to the gas volume supplied in Q1 2007) and to 1.8 bcm in 1998, all of which was exported to Iran.

After exports were curtailed in the second quarter of 1997, Turkmenistan reduced the number of active production gas wells from 3,000 (level maintained since the early 1990s) to 622 in 1998, leading to a nearly 80% cut in production.

The steep decline in gas production and exports resulted in a sharp decrease in foreign currency flows into the country and, consequently, in investment into the gas industry. The limited funding was mainly used to shut down wells.

Chart 3-1. Gas production in Turkmenistan from 1992 to 1999, bcm



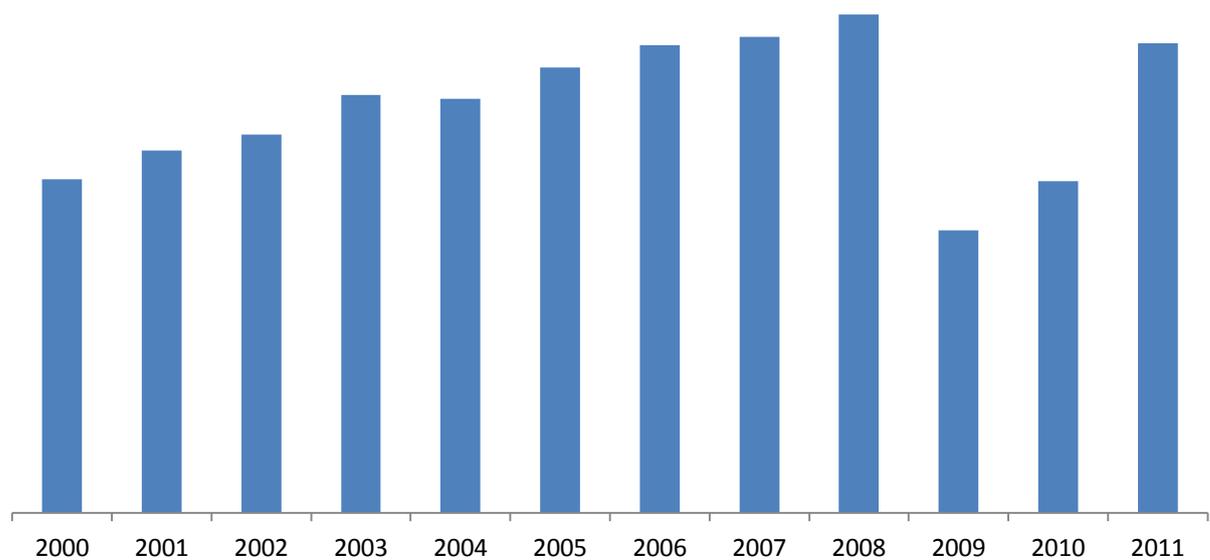
Source: Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan

Gas supplies to Ukraine were resumed in 1999, and a new export route to Iran began operating at the end of 1997, with the commissioning of the Korpedzhe-Kurt-Kui gas pipeline. These developments helped reverse the decline in gas production, gradually increasing it to over XX bcm in 2008, which exceeds the level of production in the first years of independence.

After the demand for gas in Europe declined in 2009 it was no longer profitable for Gazprom to buy gas in Turkmenistan at the prices set in the contract, which at the time were higher than those in Europe. Having failed to agree with Turkmenistan on a price revision, Gazprom reduced the gas intake to a minimum of XX Bcm. The sharp decline in the intake created an excess pressure on the Turkmenian section of the Central Asia-Center Pipeline 3 and ruptured the gas pipeline. At the end of December 2009 the presidents of Russia and Turkmenistan agreed on a resumption of Turkmenian gas supplies on new terms whereby gas prices were to be set every quarter based on the European formula minus transportation costs. The previously agreed volumes to be purchased were reduced.

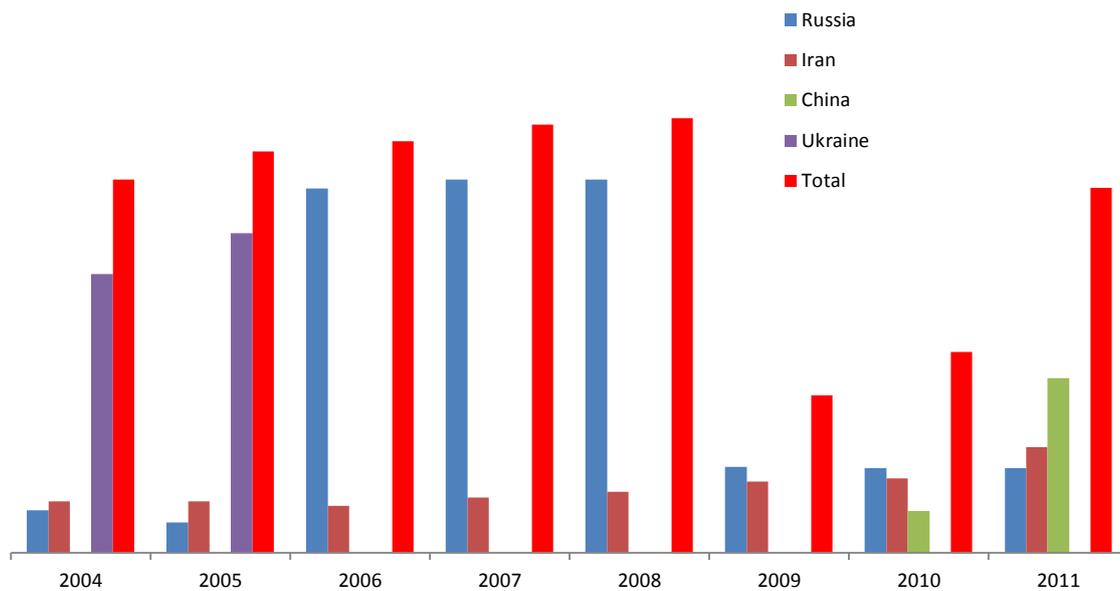
In 2009-2011 the export of Turkmenian gas to Russia remained at the minimum level of XX Bcm. Having lost the chance to export the same volumes of gas along the northern route Turkmenistan was forced to halve gas production in 2009. It started to restore production in 2010. The growth of production was driven by the launch of exports to China. In 2011 the republic produced XX Bcm of gas, a XX% increase on 2010 as gas exports to Iran and China grew considerably (Chart 3-3). In 2011 Turkmenistan restored production almost to the level of 2007 through diversifying export routes to the north (Russia), east (China) and south (Iran).

Chart 3-2. Gas production in Turkmenistan from 2000 to 2011, bcm



Source: Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan

Chart 3-3. Turkmenistan's gas exports from 2000 to 2011, bcm



Source: Ministry of Oil and Gas Industry and Mineral Resources of Turkmenistan