



# 2014 Minerals Yearbook

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## TURKMENISTAN

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# THE MINERAL INDUSTRY OF TURKMENISTAN

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Turkmenistan has more than 200 identified mineral deposits, including barite, celestine, copper, clays (such as bentonite and kaolin), coal, gypsum, lead, marble, potash, quartz sand, salt, sand and gravel, sulfur, and zinc. The country's most important mineral deposits, from an economic prospective, are its crude oil and natural gas deposits and bromine-iodine brines. Turkmenistan was ranked fourth (excluding U.S. production) in the world in iodine production and eighth (excluding U.S. production) in bromine production in 2014. Turkmenistan had the world's fourth-ranked proven natural gas reserves, after Iran, Qatar, and Russia, which were estimated to be 17.5 trillion cubic meters (BP p.l.c., 2015, p. 6). The country's proven crude oil reserves were estimated to be 600 million barrels (Mbbbl) (BP p.l.c., 2015, p. 20). In 2014, the nonfuel minerals produced in Turkmenistan included bentonite clay, cement, gypsum, lime, and salt (Ministry of Nature Protection of Turkmenistan, 2012, p. 11; Infoabad, 2013; Schnebele, 2016a, b).

## Minerals in the National Economy

In 2014, the nominal gross domestic product (GDP) increased by about 15% to \$47.93 billion from \$41.85 billion in 2013. Turkmenistan's real GDP increased by 10.3% in 2014 compared with 10.2% in 2013 owing to the increase in natural gas exports to China. In 2014, hydrocarbon production increased by 6.1%. Industrial production increased by 11.4% in 2014 compared with 7.3% in 2013 owing to the increase in the production of chemicals, construction materials, electric power, and hydrocarbons. The Government continued development of the nonhydrocarbon sectors by adopting in 2012 the National Socio-Economic Development Program of 2012–2016. The program included plans for modernization of the country's infrastructure and promotion of foreign direct investment (FDI), which would help to diversify the economy of Turkmenistan and to reduce the country's reliance on hydrocarbon resources (Asian Development Bank, 2014, p. 121; 2015, p. 132; European Commission, 2014, p. 2; International Monetary Fund, 2014, p. 5).

Most of the FDI in Turkmenistan was invested in the crude oil and natural gas sector. The FDI was directed toward the development of three onshore production-sharing agreements (PSAs)—the Nebitdag contractual territory, which was operated by Eni S.p.A of Italy (previously by Burren Energy Plc. of the United Kingdom); the Khazar project, which was a joint venture between the State Oil Company Turkmenneft and Mitro International of Austria; and the Bagtyarlyk Contractual Territory, which was operated by China National Petroleum Corp. (CNPC). Six additional PSAs were in effect for Caspian Sea offshore operations, including Block I, which was operated by Petroliaam Nasional Berhad (Petronas) of Malaysia; Block II (Cheleken Contractual Territory), which was operated by Dragon Oil Plc. of the United Arab Emirates; Block III,

which was operated by Buried Hill Serdar Ltd. of Cyprus; Blocks 11 and 12, which was a joint venture between Maersk Oil of Denmark and Wintershall Holding GmbH of Germany; Block 23, which was operated by Rheinisch-Westfälisches Elektrizitätswerk AG (RWE) of Germany; and Block 21, which was operated by ITERA Oil and Gas Company LLC of Russia (ITERA). Under the PSAs, the corporate entities were subject to a 20% profit tax and a 15% royalty; in addition, 70% of the workforce of the foreign-owned company had to be Turkmen citizens, and 20% of the social welfare tax of the local staff was to be paid by foreign investors and their subcontractors (U.S. Department of Commerce, 2014, p. 6; U.S. Department of State, 2014, p. 18).

## Government Policies and Programs

On December 23, 2014, the Government issued an amended Law on Subsoil 2014 (formerly the Law on Subsoil 1992). According to the new law, the subsoil and its resources throughout Turkmenistan, including the Caspian Sea sector, are the property of the state and cannot be purchased or sold. The objectives of the amended Law on Subsoil 2014 include the following: (1) protection of the interest of Turkmenistan and its citizens, rights of subsoil users, and mineral resources; (2) establishment of legal guarantee; and (3) creation of favorable conditions for the economic growth of the country and for investors. The law also states that the companies that use subsoil areas should conduct complete and complex geologic exploration, efficiently use mineral resources, pay fees for the use of subsoil resources, and follow the environmental requirements to prevent contamination of the subsoil. All activities related to crude oil are controlled by the Hydrocarbon Resources Law. If a signed international agreement includes rules that differ from the Hydrocarbon Resource Law, then the rules of the international agreement would be applied (Food and Agriculture Organization of the United Nations, 2014, p. 1–48; AzerNews, 2015).

According to the amended Law on Subsoil 2014, the use and protection of mineral resources is overseen by the Cabinet of Ministers of Turkmenistan, Federal agencies, and local authorities. The Cabinet of Ministers also includes the State Commission on Mineral Resources. The licenses for exploration are issued for 6 years with the right to extend them for 2 years; the mining licenses are issued for 20 years with the right to extend them for 5 years, and the licenses for exploration and mining (combined) are issued for 25 years. The licenses with no expiration date are (1) the construction and exploitation of underground structures not related to mining minerals and (2) the construction and exploitation of underground structures for waste and crude oil and natural gas storage (Food and Agriculture Organization of the United Nations, 2014, p. 1–48; AzerNews, 2015).

To support Turkmenistan's economic development, the Government planned to increase trade with neighboring countries, to develop natural resources, and to construct necessary infrastructure. In March 2013, the Presidents of Afghanistan, Tajikistan, and Turkmenistan signed a memorandum of understanding for the construction of a 400-kilometer (km)-long railway that would connect all three countries. The new railway would start in eastern Turkmenistan in the Atamyrat District, run to Akina-Andkhoy, Afghanistan, continue to Shir Kahn, Afghanistan, and connect with the town of Payndzh in Tajikistan. The project was part of the Central Asia Regional Cooperation Program, which was financed by the Asian Development Bank. The cost of the project was estimated to be between \$1.5 billion and \$2 billion. The construction of the railway started on June 2, 2013, and the railway was expected to be completed in all three countries by 2015 (Economist, The, 2013; Safirova, 2013; Salimov, 2013; Sadykov, 2014).

In 2013, Turkmenistan, Afghanistan, Pakistan, and India (collectively known as TAPI) signed an agreement for the construction of a 1,680-km natural gas pipeline. The Asian Development Bank was assigned as an advisor for this project and was to work closely with the four countries (Turkmenistan, Afghanistan, Pakistan, and India) to attract foreign investors. The TAPI pipeline was expected to start operating by 2018 with the capacity to carry 90 million cubic meters per day of natural gas. Turkmenistan expected to sell 38 million cubic meters per day of natural gas to India and Pakistan (each), and Afghanistan would receive the remaining 14 million cubic meters per day of natural gas. In 2014, the Asian Development Bank contracted with the Penspen Engineering Group of the United Kingdom to conduct a feasibility study for the TAPI natural gas pipeline. Penspen's feasibility study would include the following: (1) revision of the proposed route, (2) confirmation of the compressor station size and location, and (3) estimation of the cost of project development and the schedule. The feasibility study was expected to take 6 months to complete (Hindu, The, 2012; Penspen, 2014; Press Trust of India, 2014).

## Production

Detailed production data and other information regarding mineral production for most mineral commodities in Turkmenistan, except natural gas and petroleum, have not been available for a number of years. The State Committee on Statistics of Turkmenistan reported production rates of growth for most of the economic categories that it tracks, including those for construction materials, metals, mineral fertilizers, and mineral products. Production estimates in table 1 are based on past levels of production and on occasional published data reported by the mass media. In 2014, bentonite production increased by 11%; cement, by 9%; natural gas, by 11%; ammonia nitrogen, N content, by 3%; and rolled steel, by 1% (Safirova, 2013, p. 46.1; State Committee on Statistics of Turkmenistan, 2015, p. 2–3). Data on mineral production are in table 1.

## Structure of the Mineral Industry

In 2007, the State Company Turkmenkhimiya, under the President of Turkmenistan, was formed by merging two joint-stock companies—Turkmendokun fertilizers and Turkmenyod. State-owned Turkmenkhimiya State Concern operated 10 facilities in Turkmenistan—the Balkanabat iodine plant, the Bereket iodine plant, Dokunkhimiya company, the Guvlyduz plant, IA Turkmenmineral, the Institute of Chemistry, the Khazar chemical plants, PO Garabogassulfat, PO Maryazot, and the Turkmenkarbamid plant. Turkmenkhimiya State Concern was responsible for the implementation of new technology in chemical facilities, the distribution of fertilizers and chemical products to the agricultural industries and the citizens of Turkmenistan, and the export of fertilizers and chemical products (Neft and Gas Turkmenistana, 2006a; TurkmenPortal, 2015).

Turkmenneft State Concern was a leading oil company in Turkmenistan. The company was responsible for the development of bentonite and oil production, the renovation of oil-extracting and mining industries, the exploration and exploitation of crude oil fields, and the export of bentonite and crude oil products. Turkmengas was a leading natural gas company in Turkmenistan and was responsible for the development of natural gas and gas condensate fields, the drilling programs for eastern Turkmenistan, and the processing and transportation of natural gas, gas condensate, and liquid gas domestically and abroad (Neft and Gas Turkmenistana, 2006b, c; Gulf Oil and Gas, 2015). Table 2 is a list of major mineral industry facilities.

## Mineral Trade

Turkmenistan's total trade value, including exports and imports, increased by 2.7% to \$34.8 billion in 2014 from \$33.9 billion (revised) in 2013, owing to an increase in gas exports to China. Total exports were valued at \$19.6 billion, of which hydrocarbon exports accounted for \$18.5 billion (94% of the total export value), and total imports were valued at \$15.2 billion. Export commodities included cotton fiber, crude oil, gas, petrochemicals, and textiles. In 2013 (the latest year for which detailed data were available), Turkmenistan's main export partners were China (which received 66%, revised, of Turkmenistan's exports), the countries of the European Union (8%, revised), Turkey (5%), Afghanistan (3%, revised), the United Arab Emirates (3%), Iran (2%), and other countries (13%). Import commodities included chemicals, foodstuff, and machinery and equipment. In 2013 (the latest year for which detailed data were available), the main import partners were Turkey (which supplied 22%, revised, of Turkmenistan's imports), Russia (16%), the countries of the European Union (15%), China (13%), the United Arab Emirates (7%), Ukraine (4%, revised), Belarus (4%), and Iran, the United States, and Uzbekistan (3%, each) (International Monetary Fund, 2014, p. 5; European Commission, 2015, p. 9).

In 2014, imports from the United States to Turkmenistan were valued at about \$455.5 million compared with \$261.8 million in 2013; these included \$2.1 million in finished metal shapes, \$1.96 million in iron and steel products, \$776,000 in nonmetallic

minerals, \$533,000 in petroleum products, \$118,000 in iron and steel mill products, \$116,000 in coal and fuels, \$25,000 in aluminum and alumina, and \$11,000 in copper (U.S. Census Bureau, 2014).

## Commodity Review

### *Industrial Minerals*

**Bromine and Iodine.**—The Government tasked Turkmenkhimiya State Concern with overseeing an increase in the production capacity of its chemical plants in the Balkan Welayaty, such as the Balkanabat iodine plant in Balkanabat City, the Bereket iodine plant in Gumdag City, and the Hazar chemical plant in Hazar City, by modernizing equipment at the plants. The modernization program was expected to last until 2030, by which time the production capacity at the Balkanabat iodine plant was expected to increase to 275 metric tons per year (t/yr) of iodine and 2,645 t/yr of bromine, and at the Hazar plant, to 330 t/yr of iodine and 4,960 t/yr of bromine (Regnum, 2012).

**Cement.**—In 2014, cement production in Turkmenistan increased by 9% to 2.9 million metric tons (Mt) from 2.65 Mt in 2013. Turkmenistan had four cement plants operating with a total production capacity of 4.65 million metric tons per year (Mt/yr). State-owned Turkmcement operated two cement plants—JSC Kelyatinskiy cement plant (formerly JSC Bezmeyinskiy cement plant) and JSC Baharlynskiy cement plant. Polimeks İnşaat Taahhüt ve San. Tic. A.Ş. of Turkey (Polimeks) operated the other two cement plants—Jebel in the Balkan Welayaty and Garlyk in Lebap Welayaty. The Garlyk cement plant in the Lebap Welayaty began operations in 2013 with a production capacity of 1.4 Mt/yr. The Garlyk plant produced portland cement, oil well cement, and sulfate-resistant cement, and it employed 800 people. Turkmenistan planned to build a new cement plant in the Lebap Welayaty with a designed capacity of 1 Mt/yr as the part of the National Socio-Economic Development Program of 2012–2016 (Global Cement 2013; Global Cement, 2014; Chumakin, 2015; Ussae, 2015).

**Nitrogen.**—In 2014, the Government continued construction and improvement of the chemical plants. In 2014, production of nitrogen (N content of ammonia) increased by 3% to 293,000 metric tons (t) from 285,000 t in 2013. In 2011, Renaissance Heavy Industries (a subdivision of Renaissance Construction of Turkey), which was headquartered in St. Petersburg, Russia, was awarded the contract for the construction of a large-scale nitrogen-production complex in Mary City. Renaissance Heavy Industries worked in cooperation with Turkmenkhimiya State Concern, Kawasaki Plant Ltd. of Japan, and Sojitz Corp. of China. The main construction work was completed in January 2014, and the pre-commissioning and commissioning work were in progress throughout 2014. The complex would use Turkmenistan's natural gas as feedstock to produce 463,000 t/yr of ammonia and 743,000 t/yr of urea (Chumakin, 2013; Renaissance Construction, 2014a; Renaissance Heavy Industry, 2014, p. 4).

In 2013, an agreement was signed between the GAP İnşaat Yatırım ve Dış Ticaret A.Ş. of Turkey, Mitsubishi Corp. of Japan, and Turkmenkhimiya State Concern for the construction of a large chemical plant in the city of Garabogaz in the

Balkan Welayaty, near the Caspian Sea. Mitsubishi Corp. in cooperation with GAP İnşaat Yatırım ve Dış Ticaret A.Ş. was expected to begin construction of the plant in the first half of 2015. The cost of the project was estimated to be \$1.3 billion. The plant was expected to start operations in June 2018 with a production capacity of 730,000 t/yr of ammonia and about 1.3 Mt/yr of urea (AzerNews, 2013b, p. 6).

**Potash.**—Turkmenistan had three identified potash deposits—the Garlyk, the Karabil, and the Tubegatan. The total potash resources of the three deposits were estimated to be approximately 2.8 billion metric tons. In 2010, Turkmenkhimiya signed an agreement with JSC Belgorkhimprom of Belarus for the construction of a new potash plant in the eastern Lebap Welayaty, Turkmenistan. The plant's production capacity was expected to be 1.4 Mt/yr of potash and could be increased to 4 Mt/yr. Construction of the plant was underway in 2014, and was expected to be completed in 2015. The cost of the project was estimated to be \$1 billion (Free Library, The, 2014; Turkmenistan.ru, 2015).

**Sulfur.**—In 2013, the Government planned to construct a sulfuric acid plant in Turkmenabad, which would have a production capacity of 500,000 t/yr. In 2013, Renaissance Heavy Industries, in cooperation with a consortium consisting of Mitsui Engineering & Shipbuilding Co., Ltd. of Japan and Rönesan Türkmen İnşaat Sanayi ve Ticaret A.Ş. of Turkey, was awarded the construction contract. The cost of the project was estimated to be \$200 million. The Japan Bank for International Cooperation agreed to finance the project, which was expected to be completed by 2016. The sulfuric acid produced would be used in fertilizer production (DKL Engineering, Inc, 2014; Hanafusa, 2014; Renaissance Construction, 2014a, b).

### *Mineral Fuels and Related Materials*

**Oil and Natural Gas.**—In 2014, Turkmenistan remained a leading natural gas exporter among Caspian and Central Asian countries. Turkmenistan produced 69 billion cubic meters of natural gas, of which 41.6 billion cubic meters were exported by pipeline to China (61%), Russia (22%), Iran (16%), and Kazakhstan (1%). In October, OAO Gazprom of Russia announced that it would reduce natural gas imports from Turkmenistan by 11 billion cubic meters per year to 4 billion cubic meters per year in 2015 (Natural Gas Europe, 2014; Alexander's Gas and Oil Connections, 2015; BP p.l.c., 2015, p. 22, 29).

In 2014, the C line, which was constructed by CNPC, was commissioned with a capacity to transport of 25 billion cubic meters per year of natural gas. The line was expected to be fully operational at the end of 2015 with a transmission capacity of 55 billion cubic meters per year. The starting point of the C line was at Gedaim, on the Turkmen-Uzbek border; it goes through Uzbekistan and Kazakhstan and ends at the border town of Khorgos in the western Xinjiang Region where it links with China's domestic west-east pipeline (Platts, 2013).

In 2011, the CNCP and state-owned Turkmengaz agreed to increase natural gas shipments to China to 65 billion cubic meters per year through the D line by 2016. The D line was expected to run from Turkmenistan through Uzbekistan,

Tajikistan, and Kyrgyzstan to China. The project was expected to be completed in 2016. The additional natural gas supply for the D line was expected to come from the Galkynysh (formerly Southern Yolotan-Osman) gasfield. The total reserves of the Galkynysh deposit, which is located in southern Yolotan District, were estimated to be between 13.1 trillion cubic meters and 21.2 trillion cubic meters. The development of Galkynysh started in 2009 when Petrofac Ltd. of Jersey (United Kingdom) was awarded a \$3.4 billion contract for construction of a gas-treatment plant with a production capacity of 10 billion cubic meters per year of natural gas. The project would also include construction of infrastructure and pipelines with the capacity to transport 20 billion cubic meters per year. In September 2013, the President of China announced the completion of the first phase of construction and declared that the second phase of the project had been initiated (Gurt, 2013; Jafarova, 2013; Platts, 2013; 2014; RIA Novosti, 2013; Tiantian, 2013; Natural Gas Asia, 2014; White and Phua, 2014, p. 4).

Eni operated a project under a PSA with the State Agency for Management and Use of Hydrocarbon Resources (SAMUHR) for the Nebitdag Block—a 200-square-kilometer (km<sup>2</sup>) area located in western Turkmenistan. Eni produced 3.0 Mbbl of crude oil from the project in 2014, mainly from the Burun oilfield. The crude oil was transported by pipeline to the refinery in Turkmenbashi. In 2014, Eni and SAMUHR signed an addendum to the original PSA. The new PSA, which extended the agreement to 2032, included new regulations regarding exploration and production activities at the onshore Nebitdag area, the transfer of 10% of Eni's 100% stake in the Nebitdag Block to the state-owned oil company Turkmenneft, and provisions for training of local staff in the crude oil and natural gas sector. Eni also signed a memorandum of understanding with the SAMUHR to evaluate Eni's activities in the Caspian Sea offshore Turkmenistan (Eni S.p.A., 2014, p. 39, 47).

In May 2013, a joint venture of Hyundai Engineering Ltd. and LG International Corp. of the Republic of Korea was awarded a contract for a large-scale energy construction project. The project included the construction of a natural gas plant with a total designed production capacity of 17 Mbbl of high-octane gasoline, modernization of Turkmenistan's state-owned oil refineries, and the modernization of two existing oil refineries—the Seidi oil refinery and the Turkmenbashi complex of oil refineries. The total cost of the project was estimated to be \$4.8 billion. The refineries' modernization project included the design and construction of systems to remove sulfur from gasoline and diesel; the refineries were expected to use natural gas from the Caspian Sea shelf. The modernization project was expected to be completed in 2017, and the construction of the natural gas plant, by 2018 (AzerNews, 2013a; Hasanov, 2013b; Tandem Post, 2013; Brelsford, 2015; Yeon-jin, 2015).

In 2000, Dragon Oil Plc. of the United Arab Emirates was granted a 25-year contract under a PSA for the Cheleken area. The Cheleken contract area was estimated to be approximately 950 km<sup>2</sup>. The area consisted of two offshore oil and gas fields—the Dzheitune (Lam) field and the Dzhygalybeg (Zhdanov) field, at a water depth between 8 and 42 meters. Dragon Oil drilled 14 development and appraisal wells, of which 13 were in the Dzheitune field and 1 in the Dzhygalybeg field. On December 31, 2014, Dragon Oil's proven and probable oil and condensate reserves were estimated to be 663 Mbbl and

its oil and condensate contingent (or inferred) resources were estimated to be 93 Mbbl. The company's natural gas reserves were estimated to be 37 billion cubic meters, and its contingent (or inferred) gas resources were estimated to be 37 billion cubic meter. Dragon Oil employed 1,900 people on this project. As of 2014, Dragon Oil was at the final stage of awarding a contract for the construction of the gas treatment plant with a capacity of 3.57 billion cubic meters per year of natural gas in the Hazar area. The plant was expected to start production approximately in 2018 (Dragon Oil plc, 2014, p. 8, 10, 23).

In 2013, Rosneft of Russia acquired 100% of ITERA Oil and Gas Co. (ITERA), including a 49% share of the company from ITERA Holding Ltd. The cost of the acquisition was estimated to be \$2.9 billion. In 2009, ITERA Oil and Gas Co. of Russia signed a PSA with the SAMUHR. Under the agreement, ITERA would be able to conduct surveys for the exploration and development of oil and gas fields within offshore Block 21 in the Caspian shelf. From 2009 through 2012, ITERA conducted a two-dimensional-four-component (2D-4C) and a three-dimensional-four-component (3D-4C) seismic survey, and processed and interpreted two-dimensional and three-dimensional data. In 2013, ITERA drilled the first exploration well on Block 21. ITERA was expected to employ Turkmen citizens, to provide training, and to construct social facilities eventually (Hasanov, 2013a; Karpukhin, 2013; Oil and Gas Journal, 2013; ITERA International Group of Companies, 2014).

**Uranium.**—In 2009, AXG Mining Ltd. of Australia acquired Mineral and Petroleum Products Ltd. of the British Virgin Islands, which owned mineral licenses for two areas—the Taurkyr (Kaplankyr-Taurkyr) license in the western Qarakum Desert in northwestern Turkmenistan and the Koytendag license in the east. The licensed areas covered approximately 22,000 km<sup>2</sup>. In 2011, AXG Mining Ltd. closed its office in Turkmenistan (AXG Mining Ltd., 2009, p. 14; 2012, p. 14).

Taurkyr consists of three uranium deposits—Amanbulak, Novodgodneye, Sernoye—and one occurrence. Sernoye, which is a structurally controlled volcanic-type deposit, was discovered in 1952 and was mined by open pit and underground methods from 1952 to 1967. The mineralization, which is vein type, is 130 meters (m) long at the surface and 50 m wide. Uranium appears on the surface of a mineralized zone that is approximately 2 km long and 200 m wide and extends to a depth of 300 m (Dahlkamp, 2009).

Novodgodneye is a low-grade uranium deposit that grades between 0.01% and 0.1% uranium. The deposit was estimated to have an average grade of 0.03% uranium and to contain 2,000 to 2,500 t of uranium and 10,000 to 15,000 t of molybdenum (Dahlkamp, 2009, p. 397–398). The Amanbulak deposit, which is located 5 km southeast of Sernoye, has a grade of 0.12% uranium (maximum of 5% uranium) over a width of 13 m and a length of 35 m to 40 m. The Bailik occurrence, which is located 10 km north-northwest of Sernoye, has two sectors of mineralization at depths of 130 m to 180 m. The northern sector was estimated to contain 5,000 t of uranium in weakly metamorphosed black and gray shales (Dahlkamp, 2009, p. 398–400).

## Outlook

Turkmenistan is expected to continue to develop its hydrocarbon industry. The first phase of the development of the

Galkynysh gasfield has been completed, and it is likely to boost the country's natural gas production and exports. The Government also plans to develop the national oil-refining sectors because exporting refined petroleum products is usually more profitable than exporting crude oil. In 2014, Turkmenistan continued to focus on the development of the nonhydrocarbon sectors through the National Socio-Economic Development Program of 2012–2016. One sign of the emphasis on the nonhydrocarbon sectors is Turkmenistan's investment in chemical and construction material plants. The Government was planning to modernize the existing iodine and bromine plants and to construct new nitrogen- and potash-processing plants, and thus increase production in the nonhydrocarbon sectors (Chumakin, 2013; Safirova, 2013, p. 46.3).

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TABLE 1  
TURKMENISTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>	2010	2011	2012	2013	2014
METALS					
Steel, rolled	40,000	50,000	120,000	134,000	135,000
INDUSTRIAL MINERALS					
Bentonite	50,000	50,000	61,000	72,000	80,000
Bentonite powder	250	250	305 <sup>r</sup>	360 <sup>r</sup>	400
Bischofite	100	100	105	110	NA
Bromine	445	460	480	500 <sup>r</sup>	500
Cement <sup>4</sup> thousand metric tons	1,150 <sup>r</sup>	1,950 <sup>r</sup>	2,370 <sup>r</sup>	2,650 <sup>r</sup>	2,900
Gypsum	100,000	100,000	105,000	105,000	107,000
Iodine	470	470	480	500 <sup>r</sup>	500
Lime	16,000	16,000	18,000	19,000	19,400
N content of ammonia <sup>4</sup>	270,000	270,000	280,000	285,000	293,000
N content of urea <sup>4</sup>	341,000	341,000	341,000	341,000	344,000
Salt	215,000	215,000	220,000	225,000	230,000
Sodium sulfate	60,000	60,000	62,000	63,000	68,000
Sulfur <sup>4</sup>	100,000 <sup>r</sup>	200,000 <sup>r</sup>	240,000 <sup>r</sup>	400,000 <sup>r</sup>	440,000
MINERAL FUELS AND RELATED MATERIALS					
Natural gas <sup>4</sup> million cubic meters	42,400 <sup>r</sup>	59,500 <sup>r</sup>	62,300 <sup>r</sup>	62,600 <sup>r</sup>	69,000
Petroleum:					
Crude <sup>4</sup> thousand 42-gallon barrels	78,120 <sup>r</sup>	78,120 <sup>r</sup>	79,920 <sup>r</sup>	83,160 <sup>r</sup>	86,040
Refinery products do.	62,322 <sup>4</sup>	63,200	64,300	65,329 <sup>r,4</sup>	66,800 <sup>4</sup>

<sup>r</sup>Revised. NA Not available.

<sup>1</sup>Estimated data are rounded to no more than three significant digits.

<sup>2</sup>Table includes data available through June 26, 2015.

<sup>3</sup>In addition to the commodities listed, barite, bench gravel, coal, dolomite, epsomite, and kaolin are thought to be produced, but available information is inadequate to make reliable estimates of output.

<sup>4</sup>Reported figure.



TABLE 2  
TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits <sup>2</sup>	Location or deposit names	Annual capacity
Argillite	cubic meters	Yashlykskii Keramzit plant	Yagmanskoye deposit, Balkan Welayaty	200,000
Barite-witherite		Arpaklenskiy mining enterprise	Arpaklen deposit	10,000
Do.		NA	Kumytash deposit and other deposits	NA
Bench gravel and loam:				
Bench gravel		Bezmeinskiy deposit	Near Ashgabat	1,200,000
Loam		do.	do.	12,000
Bischofite, epsomite, Caspian Sea salt, Glauber's salt		Karabogazsulfate Association	Kara-Bogaz-Gol Lagoon, off the Caspian Sea	NA
Bromine		Cheleken plant	Cheleken Peninsula	5,000
Do.		Nebitdag plant	Nebitdag, Balkan Welayaty	2,500
Cement		Bezmeinky cement plant (state-owned Turkmenement)	Bezmein	1,000,000
Do.		Kelete cement plant (state-owned Turkmenement)	70 kilometers west of Ashgabat	1,250,000
Do.		Jebel cement plant (Polimek Insaat Taahhüt ve San. Tic. A. Şh.)	Jebel, Balkanabat Nebitdag region	1,000,000
Do.		Garlyk cement plant (Polimek Insaat Taahhüt ve San. Tic. A. Şh.)	Lebap Welayaty, Turkmenabat region	1,400,000
Clays:				
Bentonite		Oglanly Mine	Oglanly region, Balkan Welayaty	100,000
Kaolin		Ashkhabad glass plant	Kyzylkainskoye deposit	80,000 <sup>c</sup>
Do.		Tuarkyrskoye deposit	250 kilometers southeast of Turkmenbashi	NA
Coal		do.	do.	NA
Dolomite		Ashkhabad glass plant	Kelyatinskoye deposit	6,000 <sup>c</sup>
Gypsum		IA Turkmenmineral	Mukry, Tagorin deposits	300,000
Do.		Wastes from Gaurdak sulfur deposit	Gaurdak, Gora	400,000
Do.		Krasnovodsk Aylagy (anhydride) deposit	9 kilometers east of Turkmenbashi	160,000
Iodine		Khazar chemical plant (SI Turkmenhimiya Holding)	Khazar, Balkan Welayaty	355
Do.		Balkanabatskiy iodine plant (SI Turkmenhimiya Holding)	Balkanabat, Balkan Welayaty	255 <sup>c</sup>
Do.		Bereketskiy iodine plant (SI Turkmenhimiya Holding)	Kumdag, Balkan Welayaty	NA
Limestone		Deposits: Gaurdak Kara-Dzhumalaks koye	4 kilometers northeast of Gaurdak 60 kilometers from Gaurdak	NA NA
Limestone, for facing materials		NA	Charshanginskoye, Gaurdaks koye, Geok- Tepinskoye, Kaylyu, Krasnovodsk Aylagy (tuff and granite), and Tyuzmergenskoye deposits	NA
Natural gas	million cubic meters	Achakskoye, Dauletabad, Doviët-Denmez (Donmez), Gygyrlinskoye, Ioltan (South Yolotan-Osman), North and South Naipskiye, Shatlyk, and Yashlar deposits	Onshore in eastern and southwestern parts of the country and offshore in the Caspian Sea; Murgab basin; Dashoguzskiy, Lebapskiy, Maryyskiy deposits	90,000 <sup>c</sup>
Do.	do.	China National Petroleum Corporation	Amu Darya Basin	5,000
Do.	do.	Eni S.p.A.	Nebitdag Block	60
Ozokerite (hydrocarbon wax)		Cheleken mining enterprise	Cheleken Peninsula	NA
Petroleum:				
Crude	thousand 42-gallon barrels	Barsa-Gelmesskoye, Burunskoye, Cheleken, Gograndagskoye, Ioltan (South Yolotan-Osman), Kamyshldzhinskoye, Korturtepinskoye, Kum Dag, Kuydzhijskoye, Okaremskoye, and Yashlar deposits	Centered in the Caspian plain in western Turkmenistan and in offshore oilfields to the west of the Cheleken Peninsula in the Caspian Sea	80,600 <sup>c</sup>

See footnotes at the end of table

TABLE 2—Continued  
TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits <sup>2</sup>	Location or deposit names	Annual capacity
Petroleum—Continued:				
Crude—Continued	thousand 42-gallon barrels	Eni S.p.A.	Nebitdag Block	3,000
Do.	do.	Dragon Oil	Cheleken Basin	35,000
Petroleum:				
Refined	do.	Refineries: Seidi oil refinery Turkmenbashi complex of oil refineries	Of which: Lebap Welayaty Turkmenbashi	78,000 <sup>3</sup>
Do.		Karabil'skoye deposit	17 kilometers south of Gaurdak	NA
Quartz sand		Annauskoye, Babadurmazskoye, Bakhardenskoye, and Kelyatinskoye deposits	NA	NA
Rock salt		Gaurdak deposit	8 kilometers from Gaurdak	15,000 <sup>c</sup>
Do.		Khodzhaguymaskoye deposit	4 kilometers west of Gaurdak	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	2,000 <sup>c</sup>
Do.		Uzun-Kudukskoye deposit	20 kilometers from Gaurdak	2,000 <sup>c</sup>
Salt		Kuulinskoye	40 kilometers north of Turkmenbashi	650,000 <sup>c</sup>
Salt, iodized		Guvludyz Salt Factory	Balkan Welayaty	60,000
Sand and gravel	cubic meters	Dushakoye deposit	NA	1,150,000
Do.	do.	Kala-I-Morskoye deposit	NA	925,000
Do.	do.	Kernayskoye deposit	NA	36,000
Do.	do.	Kubatayskoye deposit	NA	740,000
Do.	do.	Ufrinskoye deposit	NA	900,000
Sodium sulfate		Karabogazsulfate Association	Bekdash, Kara-Bogaz-Gol Lagoon (off the Caspian Sea coast)	400,000
Steel, rolled		Turkmen metallurgical plant	Near Ashgabat	160,000
Do.		Shakhtaminskoye deposit	do.	NA
Do.		IA Turkmenmineral	Gora deposit	340,000
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	NA
Sulfur		China National Petroleum Corp., Petrofac Ltd., LG International Corp., Hyundai Engineering and Construction Corp. Ltd.	Three plants, Galkynysh	3,430,000

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

<sup>1</sup>Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

<sup>2</sup>The majority of companies are Government-owned.

<sup>3</sup>Capacity estimates are totals for all enterprises that produce that commodity.