



2010 Minerals Yearbook

AFGHANISTAN

THE MINERAL INDUSTRY OF AFGHANISTAN

By Chin S. Kuo

Afghanistan has large untapped energy and mineral resources, which have great potential to contribute to the country's economic development and growth. The major mineral resources include chromium, copper, gold, iron ore, lead and zinc, lithium, marble, precious and semiprecious stones, sulfur, and talc. The energy resources consist of natural gas and petroleum. The Government was working to introduce new mineral and hydrocarbon laws that would meet international standards of governance.

The U.S. Geological Survey (USGS) and the British Geological Survey were doing resource estimation work in the country. Prior to that work, Afghanistan's exploration activity had been conducted by geologists from the Soviet Union who left good-quality geologic records that indicate significant mineral potential. Resource development would require improvements in the infrastructure and security in Afghanistan. The Government had awarded contracts to develop the Aynak copper project and the Hajigak iron ore project; in addition, the Government could offer tenders for new exploration, including exploration of copper at Balkhab, gold at Badakhshan, gemstones and lithium at Nuristan, and oil and gas at Sheberghan.

The Ministry of Mines drew up its first business reform plan in a bid to create a more accountable and transparent mining industry. Afghanistan joined the Extractive Industries Transparency Initiative as a candidate country. It was expected that after 5 years, the contribution of royalties from mineral production to the revenues of the Government would be at least \$1.2 billion per year, and that after 15 years, the contribution would increase to \$3.5 billion per year (Graham-Harrison, 2010). Afghanistan has no local ownership requirements and its Constitution does not allow for nationalization. The 20% corporate tax rate was the lowest in the region.

Afghanistan's mining industry was at a primitive artisanal stage of development; the operations were all low scale and output was supplied to local and regional markets. The Government considered development of the country's mineral resources to be a priority for economic growth, including development of the industrial mineral resources (such as gravel, sand, and limestone for cement) for use by the domestic construction industry. Investment in infrastructure and transportation projects for mining was a critical aspect of developing the mining industry.

The Government planned to complete Afghanistan's first railway with an investment of \$170 million by the end of 2010. The 76-kilometer (km) route would link Mazar-i-Sharif to the extensive rail networks in Uzbekistan and Turkmenistan. For the first part of the project, which was funded by the Asian Development Bank (\$165 million) and other sources (\$5 million), 32 km of track had been laid by the Uzbek national rail company, Uzbekistan Temir Yollari, from Hairatan on the Uzbek border to Mazar-i-Sharif. The new route would

allow Afghan exporters to transport minerals and other goods into Europe. Metallurgical Group Corp. of China (MCC) also planned to build a railroad to transport copper ore in Afghanistan from Aynak to Kabul (Farmer, 2010).

Production

Owing to the lack of mineral production data reported by the miners, information about Afghanistan's mining activities was not readily available, but they appeared to be limited in scope. The Government provided only partial output data for 2010 (table 1). Production of barite was estimated by the USGS to be about 2,000 metric tons (t); chromite, 6,000 t; and natural gas liquids, 45,000 barrels. In the process of reconstruction and infrastructure development, output of construction minerals was estimated to have increased to meet the domestic requirements. Production of cement increased by 13% compared with that of 2009.

Structure of the Mineral Industry

Privatization of Afghanistan's state-owned companies, which controlled many of the country's mineral resources, was ongoing but not complete. Investment in the mining sector by private domestic companies and foreign investors was encouraged by the Government, which had offered the first contract for development of the Aynak copper project to two Chinese companies in 2007. The Government also issued the tenders for the development of the Hajigak iron ore project in 2009 and tenders for oil and gas exploration in 2010. The Ministry of Mines is involved in the exploration for and development, exploitation, and processing of minerals and hydrocarbons. The Ministry is also responsible for protecting the ownership and regulating the transportation and marketing of mineral resources in accordance with the country's new laws. Regulations to clarify the country's environmental laws were scheduled for adoption in 2010. Afghanistan's mineral production facilities are listed in table 2.

Commodity Review

Metals

Copper.—The \$4.4 billion Aynak copper project, which is located 48 km south of Kabul in Logar Province, was expected to create 4,000 jobs when MCC (75%) and Jiangxi Copper Co. Ltd. (25%) begin production in 2014. MCC was working on engineering, environmental, and social studies and was scheduled to complete the full feasibility study in January 2011. The deposit was estimated to contain 11.3 million metric tons (Mt) of copper. The mine was expected to produce 300,000 metric tons per year of copper concentrate. The annual royalty paid to the Government on output from the mine was expected to average more than \$300 million. The contract to

develop the mine for 30 years was awarded in November 2007. MCC also planned to build a 400-megawatt powerplant and a railway linking Aynak and Kabul. The powerplant would require 1.2 million metric tons per year of coal from the country and other sources. In another development, the Government planned to launch tenders in late 2011 for the Balkhab copper deposit, which had reserves of about 45 Mt of copper (Bakr, 2010).

The development of the Aynak copper mine could be delayed by the discovery of ancient Buddhist relics at Mes Aynak, which were estimated to be 2,600 years old. The monastery complex began to be excavated in 2009, although many of its frescoes and statues remained in place. All relics would be moved before the mining begins. The Government allocated \$2 million for the dig, which was expected to take 3 years. MCC was committed to preserving the relics and developing the mine. Stringent provisions in the mining laws require that the safe removal and preservation of archaeological or cultural relics take priority over mining activity (Miningweekly.com, 2010).

Gold.—The Afghan Government signed a deal with Afghan Krystal Natural Resources Co. (a local company) to invest up to \$50 million in the Qara Zaghan Mine in northern Baghlan Province. Qara Zaghan was the country's second gold mine, and production there was planned to begin by 2013. The mine's gold reserves were not yet known, but the company intended to spend the next 2 years exploring the site. Investors from Indonesia, Turkey, the United Kingdom, and the United States were backing the project. The first gold mine was being developed by Westland General Trading LLC of the United Arab Emirates at Nor Aaba near the border with Tajikistan in northern Takhar Province. The mine was expected to provide \$4 million to \$5 million per year in royalties to the Government (Nichols, 2011).

Iron Ore.—The Government extended the deadline for seven Asian companies to submit final bids for the license to mine iron ore at Hajigak to February 15, 2010. Only one of the seven potential bidders visited the site, however. One possible reason for the low number of bidders was the global recession. International mining companies were cautious about bidding on an Afghan tender. China and India were in pursuit of mineral resources and sent their companies to the bidding. The short list of the bidders under consideration included Al-Tuwairqi Holding of Saudi Arabia, MCC of China, and a unit of Vedanta Resources plc of the United Kingdom. Three Indian companies—Essar Minerals Ltd., Ispat Industries Ltd., and Rashtriya Ispat Nigam Ltd.—also participated in the bidding process. MCC subsequently decided not to proceed with the project and dropped out of the bidding round. JSW Steel Ltd. of India also withdrew because of the delay in the bidding process. Sesa Goa Ltd. of India, which was the unit of Vedanta Resources, was disqualified from the bidding process because it declined to sign a required confidentiality agreement about the deposit. The bidding process was restarted in August. The Government planned to award a license in 6 to 9 months (Najafizada and Rupert, 2010).

The sedimentary rock-hosted Hajigak deposit is located in the Hindu Kush Mountains in Bamyan Province, 130 km west of Kabul. The deposit is Proterozoic age and contains 1,800 Mt of iron ore at a grade of 62% iron. The primary ore comprises

magnetite and pyrite with minor amounts of chalcopyrite, and the oxide ore is of hematitic type. Plans called for an associated steel mill at the site, and the mine and mill complex was projected to cost \$12 billion to build. The complex could create up to 15,000 direct and indirect jobs (Najafizada, 2010).

Industrial Minerals

Lithium.—The country's lithium deposits occur in dry lake beds in the form of lithium chloride; they are located in the western Province of Herat and in the central east Province of Ghazni. The geologic setting is similar to those found in Bolivia and Chile. The deposits are also found in hard rock in the form of spodumene in pegmatites in the northeastern Provinces of Badakhshan, Nangarhar, Nuristan, and Uruzgan. A pegmatite in the Hindu Kush Mountains in central Afghanistan was reported to contain 20% to 30% spodumene (Industrial Minerals, 2010).

Mineral Fuels

Petroleum.—The Afghan Ministry of Mines announced the discovery of an oil deposit in a triangle between Balkh, Hairatan, and Shuburghan in the northern part of the country. The field was estimated to have reserves of 1.8 billion barrels. An oil tender process for the Kashkari Block would take place in July or August 2010; a bidding round for a large block in the Afghan-Tajik Basin was scheduled for 2011 (Oil & Gas Journal, 2010).

The Government awarded a 6-month crude oil contract for the Angot field in Sar-e-Pul Province to a domestic company, Ghazanfar Neft Gas. The Angot field was among a handful of (5) developed fields in the Amu Darya Basin, which straddles Afghanistan and Turkmenistan. The Afghan side of the basin has an estimated 80 million barrels (Mbbbl) of proven reserves. The nearby Afghan-Tajik Basin could hold as much as 1,500 Mbbbl of crude oil. When the wells at Angot started production in 2011, the field was expected to produce 800 barrels per day. If the short-term contract arrangement proves successful, the Government would issue a new tender of a production-sharing contract in the spring of 2011 for extraction at Angot and the four other developed fields. Tapping the crude oil reserves could help start weaning Afghanistan's dependence on foreign aid from the United States and other donors (Londono, 2010).

References Cited

- Bakr, Amena, 2010, Interview—Afghanistan to develop \$3 trillion in mining potential: Reuters, October 25. (Accessed October 29, 2010, at <http://in.reuters.com/article/idinlde69o1v420101025>.)
- Farmer, Ben, 2010, Afghanistan to complete first railway by end of year: Telegraph Media Group Ltd., June 13. (Accessed June 14, 2010, at <http://www.telegraph.co.uk/news/worldnews/asia/afghanistan/7825064>.)
- Graham-Harrison, Emma, 2010, Afghanistan shakes up mining sector for transparency: Reuters, December 5. (Accessed December 8, 2010, at <http://www.reuters.com/article/2010/12/05/afghanistan-mining-idussge6b400g20101205>.)
- Industrial Minerals, 2010, Lack of data clouds Pentagon lithium claim: Industrial Minerals, no. 515, August, p. 58.
- Londono, Ernesto, 2010, Cautious optimism as Afghan oil starts pumping: The Washington Post, December 14, p. A16.
- Miningweekly.com, 2010, Ancient relics will delay huge Afghan copper mine: Miningweekly.com, December 6. (Accessed December 7, 2010, at <http://www.miningweekly.com/print-version>.)

Najafizada, Eltaf, 2010, Afghanistan seeks new bids for Hajigak iron deposit, other mine investment: Bloomberg.com, June 17. (Accessed June 20, 2010, at <http://www.bloomberg.com/news/2010-06-17>.)

Najafizada, Eltaf and Rupert, James, 2010, Afghanistan invites new iron mine bids over transparency issues: Bloomberg.com, February 3. (Accessed February 3, 2010, at <http://www.bloomberg.com/apps/news?pid=20601109&sid=ah1kvg0jesim&pos=13>.)

Nichols, Michelle, 2011, Afghanistan hopes new gold deal will bring new FDI: Mineweb.com, January 10. (Accessed January 12, 2011, at <http://www.mineweb.com/mineweb/mineweb/en/pages34?oid=118176&sn=detail&pid=110649>.)

Oil & Gas Journal, 2010, Afghanistan claims 1.8 billion bbl oil field find: Oil & Gas Journal, August 18. (Accessed August 20, 2010, at http://www.ogj.com/index/article-tools-template/_printarticle/articles/oil-gas-journal/exploration-development-2.)

TABLE 1
AFGHANISTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

| Commodity | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------------------------|---------|---------|----------------------|----------------------|----------------------|
| Barite | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Cement, hydraulic | 25,000 | 30,000 | 37,300 ³ | 31,500 ³ | 35,600 ³ |
| Chromite | 6,000 | 6,800 | 7,000 | 6,000 | 6,000 |
| Coal, bituminous | 150,000 | 250,000 | 346,900 ³ | 500,100 ³ | 724,900 ³ |
| Gas, natural: | | | | | |
| Gross | 130 | 135 | 155 ³ | 142 ³ | 142 ³ |
| Marketed | 125 | 130 | 145 | 140 | 140 |
| Gypsum | 25,000 | 35,000 | 48,700 ³ | 46,400 ³ | 63,100 ³ |
| Marble | 20,000 | 30,000 | 36,900 ³ | 26,600 ³ | 28,900 ³ |
| Natural gas liquids | 45 | 45 | 45 | 45 | 45 |
| Nitrogen, N content of ammonia | 15 | 16 | 18 ³ | 22 ³ | 27 ³ |
| Petroleum, condensate | 60 | 100 | 156 ³ | 104 ³ | 64 ³ |
| Salt, rock | 165,000 | 170,000 | 158,200 ³ | 180,300 ³ | 186,100 ³ |

do. Ditto.

¹Estimated data are rounded to no more than three significant digits.

²Table includes data available through June 29, 2011.

³Reported figure.

TABLE 2
AFGHANISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of main facilities | Annual capacity ^e |
|------------------------------|--|--------------------------------------|------------------------------|
| Aluminum: | | | |
| Extrusion and powder coating | Qader Najib Ltd. | Kabul | NA |
| Manufacture | Salam Bilal Ltd. | Kandahar | 360 |
| Copper, in concentrate | Aynak Minerals Co. Ltd. (China Metallurgical Group Corp., 75%, and Jiangxi Copper Co. Ltd., 25%) | Aynak, Logar ¹ | 180,000 |
| Lapis-lazuli | Government owned | Sary-Sang, Badakhshan | 9,000 |
| Nitrogen, urea | Kud Bergh Fertilizer Ltd. | Qala Jangi near Mazar-i-Sharif | 105,000 |
| Steel, manufacture | Khalil Najeeb Steel Mills Ltd. | Jalalabad, Kabul, and Mazar-i-Sharif | 36,000 |

^eEstimated; estimated data are rounded to no more than three significant digits. NA Not available.

¹The Aynak Mine is expected to start production in 2014.