



# 2009 Minerals Yearbook

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**CHAD**

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# THE MINERAL INDUSTRY OF CHAD

By Philip M. Mobbs

Despite the continued decline in crude oil output, hydrocarbons remained a leading segment of the economy in 2009, accounting for an estimated 34% of Chad's nominal gross domestic product. In 2009, however, oil revenues decreased significantly to about \$600 million (about 50% of Government revenue) compared with about \$1.8 billion (about 80% of Government revenue) in 2008. Some of the decrease in 2009 revenues was attributed to income tax legislation, which resulted in the advanced payment of 2009 taxes in 2008. Another factor was the decrease in the average oil prices received in 2009 (estimated to be \$53.00 per barrel) compared with that of 2008 (\$84.60 per barrel) (International Monetary Fund, 2009, p. 7; Banque des États de l'Afrique Centrale, 2010a-c).

Mining of solid minerals, which was a negligible contributor to the national economy, was regulated by the Mining Code (law No. 011/PR/95 of 1995). Exploration and production of hydrocarbons were covered by the conventions governing research, exploration, exploitation, and transportation of hydrocarbons dated December 19, 1988, and May 10, 2004, and amendments, including law No. 028/PR/00 of December 5, 2000. The Petroleum Revenue Management Law (law No. 001/PR/99 of 1999) and amendments, such as law No. 002/PR/06 of 2006, defined the allocation of petroleum revenues. Law No. 014/PR/98 of 1998 covered the general principles for the protection of the environment.

Most official international trade with landlocked Chad was channeled through seaports in Cameroon and Nigeria. Petroleum produced in the Doba Basin was exported by way of the Chad-Cameroon pipeline to an export terminal at Kribi, Cameroon. In 2009, the average monthly market price of crude oil from Chad more than doubled from \$30.76 in January to \$70.73 in December. In 2008, the average monthly market price had risen from \$76.70 in January to \$117.51 in June, before declining to the January 2009 low (Esso Exploration and Production Chad, Inc., 2010, p. 69).

## Production

Production of crude oil far exceeded the output of the country's limited suite of other mineral commodities, which included clay, gold, lime, limestone, salt, sand, soda ash (natron), and stone. Production of sand and stone aggregate was estimated to have increased. For the fourth year in a row, national oil production declined. Estimates of Chad's mineral production are in table 1.

## Structure of the Mineral Industry

The Ministère des Mines et de l'Énergie and the Ministère du Pétrole monitored the activity of various sectors of the mineral industry. Société des Hydrocarbures du Tchad S.A. was the national oil company.

Small-scale domestic mining operations produced most of the country's nonfuel minerals. International companies were involved in the exploration for and the production of crude oil and the exploration for uranium. Esso Exploration and Production Chad, Inc. (Esso Chad) and Tchad Oil Transportation Co. S.A. operated about 200 kilometers (km) of the 1,070-km crude oil pipeline that originated in Chad and ended at an offshore terminal in Cameroon.

## Commodity Review

Potential mineral exploration activity was inhibited by armed factions that engaged in hostilities primarily in eastern Chad. Activity in eastern Chad also was affected by external social instability, which included the influx of refugees from the Central African Republic and the Darfur region of western Sudan (World Food Programme, undated).

## Mineral Fuels and Related Materials

**Petroleum.**—Esso Chad reported that its crude oil output decreased to an average of 119,500 barrels per day (bbl/d) in 2009 compared with 127,200 bbl/d in 2008 and 143,600 bbl/d in 2007. Esso Chad initiated production from the Timbre field in 2009. The company also drilled an additional 93 wells in its Doba Basin oilfields, started the third phase of a high-pressure water-injection project to maintain reservoir pressure, and continued stimulations of existing wells to offset the effects of migrating fines (small mineral particles, such as clay, sand, and silt) that clogged the reservoir pore spaces near the well bores (Esso Exploration and Production Chad, Inc., 2010, p. 8).

In 2009, CNPC International Ltd. of Chad, which was a subsidiary of China National Petroleum Corp., continued to drill wells on the Permit H concession. CNPC began to build a 300-km pipeline from the Koudala field to the site of a proposed 7-million-barrel-per-year-capacity petroleum refinery near N'Djamena (Oil & Gas Journal, 2009).

In 2008 (the latest year for which information was available), Overseas Petroleum Investment Corp. (OPIC), which was a subsidiary of CPC Corp., Taiwan, explored the BCO III prospect. OPIC also held 70% interest in the BCS II and the BLT I prospects (CPC Corp., Taiwan, 2009, p. 31).

**Uranium.**—In 2009, Chad Mining Services, which was a subsidiary of Signet Mining Services Ltd. of South Africa, continued exploration on the Lere project, which included the Madagzang 1, the Madagzang 2, and the Zazere concessions near Lere in the Mayo-Kebbi Ouest Region. Signet expected that a South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC)-compliant resource statement for the project would be completed by mid-2010.

## Outlook

Esso Chad's production enhancement program, which included new oil wells, a high-pressure water injection system, and workovers of existing oil wells, has slowed the decline of crude oil output that has been observed since 2004. Development of CNPC International's Bongor Basin oil reservoirs would provide input feedstock for the N'Djamena oil refinery, which would reduce Chad's reliance on imported refined petroleum products.

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

(Thousand metric tons unless otherwise specified)

Commodity <sup>3</sup>	2005	2006	2007	2008	2009
Aggregate, sand, and stone	300	300	300	300	350
Gold, mine output, Au content	150	150	150	100 <sup>r</sup>	100
Petroleum, crude <sup>4</sup>	63,300	55,900	52,400	46,500 <sup>r</sup>	43,600
Salt	10	10	10	10	10
Soda ash, natron	12	12	12	12	12

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

<sup>2</sup>Table includes data available through April 20, 2010.

<sup>3</sup>In addition to the commodities listed, other industrial minerals and construction materials (clay, lime, and limestone) are produced, but information is inadequate to make reliable estimates of output.

<sup>4</sup>Reported figure. Production volume from the Doba Basin in Chad was metered on the floating storage-and-offloading vessel, which was located offshore Kribi, Cameroon.

TABLE 2  
CHAD: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold	Artisanal placer operations	Mayo Dala Department	150
Petroleum:			
Crude	Esso Exploration and Production Chad, Inc. (Esso Chad) (Exxon Mobil Corp., 40%; Petronas Carigali Overseas Sdh. Bhd., 35%; Chevron Overseas Petroleum Inc., 25%)	Bolobo, Kome, Maikeri, Miandoum, Moundouli, and Nya, and the Timbre fields, Doba Basin	79
Do.	CNPC International (Chad) Ltd. (a subsidiary of China National Petroleum Corp.)	Koudala, Mimosa, and Ronier fields	22 <sup>1</sup>
Refined products	CNPC International (Chad) Ltd. (a subsidiary of China National Petroleum Corp., 60%, and Société des Hydrocarbures du Tchad S.A., 40%)	near N'Djamena	7 <sup>2</sup>
Salt	Various local operators	Various locations	10,000
Soda ash	do.	Lake Chad, near Liwa	12,000

Do., do. Ditto.

<sup>1</sup>Projected capacity. Field under development.

<sup>2</sup>Under construction.