



2009 Minerals Yearbook

IRAQ

THE MINERAL INDUSTRY OF IRAQ

By Mowafa Taib

Iraq was a significant crude oil producer in 2009. It was the 10th ranked country in the world in terms of the size of its crude oil production, which averaged more than 2.4 million barrels per day (Mbbbl/d) and accounted for 3.2% of the world's crude oil output. Iraq's crude oil reserves of 115 billion barrels, which accounted for 8.6% of the world total reserves, were the fourth in the world in terms of volume after Saudi Arabia, Venezuela, and Iran. In addition to hydrocarbon commodities, which included crude oil, natural gas, and petroleum refinery products, Iraq produced bauxite, bentonite, cement, clays, gypsum, kaolin, limestone, and salt (BP p.l.c., 2010, p. 6, 8; U.S. Energy Information Administration, 2010).

Minerals in the National Economy

Iraq's real gross domestic product (GDP) grew by 4.2% in 2009 compared with a growth rate of 9.5% in 2008. The hydrocarbon sector was the country's main economic activity and accounted for 55.5% of the country's GDP. It also accounted for 68.0% of the Government revenue in 2009 compared with 77.6% in 2008. The value of Iraqi exports in 2009 decreased to about \$40.0 billion from \$61.7 billion in 2008. The value of crude oil exports was about \$39.0 billion and that of refined petroleum products exports was about \$347 million. The value of oil exports was 61% less in 2009 than in 2008 because of lower crude oil prices. For Iraq, crude oil prices averaged \$56.50 per barrel in 2009 compared with \$93.30 per barrel in 2008 and \$63.00 per barrel in 2007. The volume of crude oil exports increased by 2.6% to 1.90 Mbbbl/d from about 1.86 Mbbbl/d in 2008. The volume of refined petroleum products exports decreased by 69% to 26,200 barrels per day (bbl/d) from 84,900 bbl/d (Central Bank of Iraq, 2010, p. 61, 80; International Monetary Fund, 2010, p. 27; Organization of Arab Petroleum Exporting Countries, 2010, p. 57-58; Organization of the Petroleum Exporting Countries, 2010, p. 55).

Production

In 2009, gypsum production increased by 293%; nitrogen, by 200%; bentonite, by 147%; cement, by 32%; clay, by 28%; refined petroleum products and limestone, by 15% each; natural gas, by 12%; and crude oil, by 2% compared with the respective production levels in 2008. Bauxite production, which was reported for the first time in 2008, was 4,928 metric tons (t) in 2008 but decreased by about 95% to 250 t in 2009; dry gas production decreased by 39% during the same period (table 1).

Structure of the Mineral Industry

The Ministry of Oil managed Iraq's hydrocarbon sector activity and the Ministry of Industry and Minerals (MIM) administered the activity of the nonfuel mineral sector. The State Company of Geological Survey and Mining (Geosurv), which

was an agency of the MIM, conducted studies on Iraq's geology, mapping, and mineral exploration. Geosurv produced industrial minerals, including bauxite, bentonite, clays, construction and silica sand, feldspar, ironstone, kaolin, and salt (State Company of Geological Survey and Mining, 2010).

As of yearend 2009, the draft gas and oil legislation known as the Hydrocarbon Law, which was first proposed in 2007, remained stalled because of disagreements among Iraqi parties on wider political issues. The proposed law would create an oil and gas council to oversee the country's oil and gas sector and would establish the Iraq National Oil Co. The proposed law also contains arrangements for petroleum revenue sharing through the creation of an Oil Revenue Fund and a Future Fund (Blanchard, 2009, p. 3, 25-28).

The Petroleum Contracts and Licensing Directorate of the Ministry of Oil invited international oil companies (IOCs) to participate in two petroleum bidding rounds in accordance with the Law of Private Investment in Crude Oil Refining (law No. 64 of 2007). The first round was held at the end of June and the second round was held in December. A third round designated for natural gas development was scheduled for October 2010.

Law No. 91 of 1988 and its amendments regulate investment in mining and other natural resources, and Investment law No. 13 of 2006 covers all areas of investment other than the oil and gas sector. The Government issued calls for investors to create joint ventures to rehabilitate public industrial enterprises, including cement, fertilizer, float glass, steel, and sulfur plants (Ministry of Industry and Minerals, undated).

Revenue from oil exports was placed in an account at the Federal Reserve Bank of New York (FBNY) and 5% was deducted for compensating the victims of the invasion and occupation of Kuwait in 1990. The remaining 95% of the revenue was deposited into the Development Fund for Iraq account at the FBNY and was then moved to Iraq's Ministry of Finance account at the Central Bank of Iraq and later dispersed to Government agencies (Blanchard, 2009, p. 16).

In the Kurdistan region of Iraq, the Kurdistan Regional Government (KRG), which is the ruling body of the federated region in northern Iraq, adopted its own hydrocarbon law in 2007 and awarded 39 hydrocarbon licenses in the Kurdistan region. DNO International ASA of Norway signed exploration and production-sharing agreements for the Dohuk, the Erbil and the Twake prospects, and Korea National Oil Corp. (KNOC) of the Republic of Korea was awarded the Bazian, the Hawler, the Qush Tappa, and the Sangaw South licenses. Dana Gas PJSC of the United Arab Emirates was awarded the Chemchemical and the Khor Mor licenses (Howard, 2010, p. 27-29).

Commodity Review

Metals

Iron and Steel.—In 2009, MIM said that it allocated \$400 million to rehabilitate the State Company for Iron and Steel at Khawr az Zubayr in Basrah Governorate in southern Iraq. MIM planned to produce 1 million metric tons per year (Mt/yr) of sponge iron, 1 Mt/yr of billet, and 1 Mt/yr of rebar. In November, Astra Industrial Group of Saudi Arabia acquired 51% of the shares of Al-Tanmia Steel Industry (a subsidiary of the Shamara Holding Co. of Jordan), which was building a steel mill, a melt shop, and a rolling mill at Khawr az Zubayr. Al-Tanmia was expected to produce 450,000 metric tons per year (t/yr) of billet and 350,000 t/yr of rebar by yearend 2010 (Arab Steel, 2009a, b).

In March 2010, ArcelorMittal of Luxembourg agreed to form a 50-50 joint venture with Dayen Co. of Turkey to build a steel minimill with an electric arc furnace at Sulaimanyia; the mill would have an initial production capacity of 250,000 t/yr of rebar that could be increased to 500,000 t/yr. The plant, which was expected to cost more than \$100 million to construct, would use local scrap metal to make rebar and was projected to be completed in 2011. The MIM and STX Corp. of the Republic of Korea signed a memorandum of understanding to establish a new iron and steel plant in Basra in southern Iraq. The new \$1 billion plant would have the capacity to produce 3 Mt/yr of iron and steel products and included a 500-megawatt power station (Arab Steel, 2010a, b).

Industrial Minerals

Cement.—Iraq was one of the leading cement importers in the region in 2009. The country imported an estimated 10 million metric tons (Mt) of cement, mainly from Iran and Turkey to satisfy local demand, which was estimated to exceed 18 Mt.

In April, Lafarge S.A. of France commenced production at the greenfield Bazian cement plant and the upgraded Tasluja cement plant. The combined capacity of both plants, which are located near the city of Suleimaniyah in northern Iraq and are within 30 kilometers of each other, was 5 Mt/yr. In May 2010, Lafarge signed a contract with Southern Cement State Co. to rehabilitate the 27-year-old Al-Rowad cement plant, which is located in Karbala Governorate in southern Iraq, to increase cement production tenfold to 2 Mt/yr by 2013 from the current production of 200,000 t/yr. Lafarge would own 51% interest in the plant and MerchantBridge and Co. of the United Arab Emirates would own 49% interest in the project. The International Finance Corp. of the World Bank agreed to invest up to \$25 million in Lafarge's holding company, and to provide up to \$50 million in loans to Bazian Cement Co., which was the project company for the Bazian cement plant, and was 70% owned by Lafarge and 30% by Faruk Rasool Group. The IFC agreed also to loan \$25 million to support Lafarge's rehabilitation of Al-Rowad plant (Lafarge S.A., 2009; International Finance Corp., 2010).

In August 2010, China National Building Material Co. Ltd. (CNBM) was awarded a \$250 million contract to build

a greenfield cement plant near the city of Samawa, which is located in Muthanna Province in southern Iraq. The plant would have an initial cement production capacity of 1 Mt/yr, which could be doubled within 3 years. CNBM was a partner with Al-Doh Investment Co. of Jordan to provide financing for the project. In October 2010, Sonoro Energy Iraq B.V. (a subsidiary of Sonoro Energy Ltd. of Canada) and Berkeley Petroleum Mesopotamia Asphalt Ltd. signed an exploration and production agreement with the Salah ad Din Provincial government for asphalt production in the Province (Thomson Reuters, 2010; Rigzone.com, 2010b).

Mineral Fuels

Natural Gas.—The South Gas Utilization project was a proposed joint venture of South Gas Co. (51% interest), Royal Dutch Shell p.l.c. (Shell) of the Netherlands (44% interest), and Mitsubishi Corp. of Japan (5% interest) to capture flared gas from a 19,000-square-kilometer area in the Governorate of Basrah in southern Iraq. The project area was extended to include the Rumaila, the Majnoon, the West Qurna 1, and the Zubair fields. Natural gas would be captured, treated, and processed for use locally and for export as liquefied natural gas. Although an initial agreement between the Government and Shell was signed in September 2008, no final agreement had been signed as of yearend 2009 (Basrah Gas, 2010; U.S. Energy Information Administration, 2010).

In June, the Ministry of Oil offered three of Iraq's gasfields for development. The Al Mansuriyah gasfield, which is located in eastern Iraq and had an estimated 93 billion cubic meters (3.3 trillion cubic feet) of gas reserves, did not receive any bids. The Akkas gasfield, which is located in the western desert of Anbar Province near the Syrian border and had estimated reserves of 59.5 billion cubic meters (2.1 trillion cubic feet) of gas, received one bid from Edison International (Oil & Gas) E&P of Italy, but the Government rejected the bid and said that it was going to develop the fields itself. The three gasfields were later included in the third bidding round in 2010, and a bid to develop the Akkas gasfield was contracted to KazMunaiGas (50%) of Kazakhstan and Korean Gas Corp. (Kogas) of the Republic of Korea (50%). The development of the Al Mansuriyah gasfield was awarded to Türkiye Petrolleri Anonim Ortaklığı (TPAO) of Turkey (50%), Kuwait Energy (30%), and Kogas (20%). The Siba gasfield, which had 2.8 billion barrels (Gbbbl) of gas reserves, was contracted to Kuwait Energy (60%) and TPAO (40%) (Howard, 2010, p. 25; Mirza, 2010).

In 2009, natural gas production by Pearl Petroleum Co. Ltd. from the Khor Mor and Chemchamel fields, which are located in the Kurdistan region of Iraq, averaged 5 million cubic meters per year. The project began in 2007 as a 50-50 joint venture of Crescent Petroleum and Dana Gas PJSC, both of the United Arab Emirates; the joint venture was expanded in 2009 to include MOL Hungarian Oil and Gas Co. p.l.c. and OMV Aktiengesellschaft of Austria. MOL and OMV each acquired 10% interest in the venture. The project aimed to supply two gas-fired power stations at Chemchamel and Erbil and to transport surplus gas to Europe through the Nabucco pipeline;

construction for the pipeline was scheduled to begin in 2010 (AMEinfo.com, 2010).

Petroleum.—Three giant oilfields were responsible for almost all crude oil production in Iraq in 2009. The major state-owned oil companies included Iraq Drilling Co., Midland Oil Co., Missan Oil Co., North Gas Co., North Oil Co., North Refinery Co., Oil Exploration Co., State Oil Marketing Organization (SOMO), South Gas Co., South Oil Co., and South Refinery Co. (Howard, 2010, p. 13).

Assuming that all the Government's planned development targets are achieved, production from the existing and new oilfields would increase by 9.6 Mbbbl/d to 11.1 Mbbbl/d from the current (2009) production of about 2.5 Mbbbl/d. The development and operation of Iraq's largest oilfield, the Rumaila, which produced 1.0 Mbbbl/d in 2009 and had 17.8 Gbbl of reserves, was awarded to a joint venture of BP p.l.c. of the United Kingdom (66.67%) and China National Petroleum Corp. (CNPC) (33.33%). A consortium of Exxon Mobil Corp. of the United States (80%) and Shell (20%) was awarded the development and operation of the West Qurna I oilfield, which produced 270,000 bbl/d of crude oil in 2009 and had 8.6 Gbbl of proved crude oil reserves. The developers and operators of the West Qurna II oilfield, which had estimated reserves of 12.9 Gbbl of crude oil, was a consortium that included Lukoil Oil Co. of Russia (85%) and Statoil ASA of Norway (15%). The operation and development of the Zubiar oilfield, which produced 205,000 bbl/d of crude oil in 2009 and had 4.0 Gbbl of crude oil reserves, went to a consortium of Eni S.p.A. of Italy (44%), Occidental Petroleum Corp. of the United States (31%), and Kogas (25%). A consortium of Shell (60%) and Petronas Carigali International Sdn Bhd (Petronas) of Malaysia (40%) won the contract to develop and operate the Majnoon oilfield, which produced 55,000 bbl/d in 2009 and had 126 billion barrels per day of crude oil reserves. A consortium of CNPC (50%), Petronas (25%), and Total S.A. of France (25%) was formed to develop and operate the Halfaya oilfield, which produced 3,000 bbl/d in 2009 and had an estimated 4.1 Gbbl of crude oil reserves. Sociedade Nacional de Petr6leos de Angola (Sonangol) of Angola won a contract from Nineveh Oil Co. to rehabilitate the Qayarah and the Najmah oilfields, which had reserves of 0.9 Gbbl each. Petronas (60%) and Japex Ltd. of Japan (40%) formed a consortium to develop and operate the Gharaff oilfield for North Oil. OAO Gazprom of Russia (40%), Petronas (30%), Kogas (20%), and TPAO (10%) established a consortium to develop the Badra greenfield for the state-owned Midland Oil Co. (Howard, 2010, p. 21-22; U.S. Energy Information Administration, 2010).

Earlier in 2008, North Oil signed a 20-year, \$3 billion contract with CNPC for the development and operation of the Al-Ahdab oilfield. Production from the Al-Ahdab oilfield was expected to increase to 115,000 bbl/d from 90,000 bbl/d after 7 years of the 20-year contract term (Petroleum Economist, 2008, p. 36).

DNO continued with its exploration of areas covered by the Tawke production-sharing contract (PSC) and the Dohuk PSC in the KRG in northern Iraq for potential drilling in 2010. DNO started crude oil production from the Tawke field in June, but it suspended operations in the KRG in September because of media reports on improper accounting of proceeds of

treasury shares sold by DNO. The company resumed operations in October following the reinstatement of DNO's production and sharing rights in the Tawke PSC. KNOC moved forward with exploration work at the Hawler, the Qush Tapa, and the Sangaw South, the Sangaw North fields, and the Bazian Block in the Kurdistan region of Iraq (Thomson Reuters, 2009; DNO International ASA, 2010, p. 11).

In 2009, Iraq's ten oil refineries had a combined capacity of 824,000 bbl/d. The Government approved a plan to increase the country's refining capacity to 1.5 Mbbbl/d by 2017, including building four new refineries at Kerbala, Kirkuk, Missan, and Nassiriyah (Organization of the Petroleum Exporting Countries, 2010; U.S. Energy Information Administration, 2010).

In October 2010, Iraq's Ministry of Oil increased the country's proved crude oil reserves by 24% to 143.1 Gbbl from the 2001 estimates of 115 Gbbl. This increase came primarily from revised estimates at 12 oilfields, and included a 71% increase in the proved reserves of the southern oilfields of Basrah, a 20% increase in the northern oilfields of Kirkuk, and a 9% increase in the central fields in East Baghdad (Rigzone.com, 2010a).

Outlook

The level of activity in Iraq's mineral industry is expected to accelerate in the next 5 years because of the rehabilitation of the country's infrastructure and the enrollment of international oil companies in the development of the country's vast hydrocarbon resources. The Government, which depends heavily on crude oil revenue to cover public expenditures and to finance reconstruction projects, has set a goal to increase its crude oil production to 12.0 Mbbbl/d in 6 years from about 2.5 Mbbbl/d achieved in 2009. The production volumes of cement and steel are expected to increase to satisfy domestic demand for these mineral commodities. Production of other industrial minerals, which are required for the construction sector to rebuild the country after decades of wars and economic sanctions, might increase as well.

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TABLE 1
IRAQ: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009	
INDUSTRIAL MINERALS						
Bauxite	metric tons	NA	NA	NA	4,928	250
Bentonite ²	do.	NA	NA	570	1,605	3,959
Cement, hydraulic ^c		3,000	3,500	4,500	6,453 ^r	8,500
Clay		NA	NA	1,019 ^r	1,777 ^r	2,283
Gravel		NA	NA	7,823	9,708	10,000
Gypsum		NA	NA	349 ^r	347 ^r	1,364
Ironstone		NA	NA	40	3	3
Kaolin	metric tons	NA	NA	3,545 ^r	1,524 ^r	1,980
Limestone		NA	NA	642 ^r	275 ^r	316
Nitrogen, N content of ammonia ^c		30	10	10	10	30
Salt ^c		50	50	153	109	113
Sand, feldspathic	metric tons	NA	NA	543	--	--
Sand, standard	do.	NA	NA	32	26	30
Silica sand	do.	NA	NA	165 ^r	19,921 ^r	20,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	11,350	11,900	13,596	14,781	16,577
Dry	do.	1,450 ^r	1,450	1,460	1,880	1,149
Natural gas plant liquids	thousand 42-gallon barrels	11,000	11,000	11,000	11,000	11,000
Petroleum:						
Crude, including lease condensate	do.	669,045	729,635	782,560	884,395	905,930
Refinery products:						
Liquefied petroleum gas	do.	20,550	20,550	6,315	11,060	18,177
Gasoline	do.	14,235	14,856	17,703	17,228	21,937
Kerosene and jet fuel	do.	12,264	12,264	9,855	17,119	17,447
Distillate fuels	do.	28,105	28,105	18,871	30,551	31,208
Residual fuels	do.	84,461	87,089	58,400	76,577	76,979
Other	do.	14,455	13,836	5,291	10,620	21,499
Total	do.	174,070	176,700	116,435	163,155	187,245
Sulfur ³		30	30	30	30	20

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through October 31, 2010.

²Reported in cubic meters and converted to metric tons.

³From petroleum and natural gas processing.

TABLE 2
IRAQ: 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	
Cement:				
Portland	Southern Cement Co. (Government, 100%)	Al Jinoob plant, Samawa; Al Najaf Al Ashref plant, Kufa; Al Sadaa plant, near Sadat Al Hindia; Karbala plant, Karbala; Kufa I plant, Kufa; Muthena plant, near Muthena; As Samawa plant, Samawa; Um Qasr plant, Um Qasr	7,500,000	
Do.	Iraqi Cement Co. (Government, 100%)	Al Qaim plant, Al Qaim; Al Tamim plant, Kirkuk; Fallujah plant, Fallujah; Kubaisa plant, Kubaisa	5,200,000	
Do.	Northern Cement Co. (Government, 100%)	Badoosh I, II, and III plants, Mosul; Hammam Al Alil I and II plants, Mosul; Sinjar plant, Mosul	3,740,000	
Do.	Lafarge S.A.	Bazian plant at Sarchinar, near Hayasi	2,700,000	
Do.	do.	Tasluja plant, near Suleimaniyah	2,300,000	
White	Iraqi Cement Co. (Government, 100%)	Fallujah white cement plant, Fallujah	300,000	
Fertilizers	State Company for Fertilizers (Government, 100%)	Ammonia plant at Abu Al-khasib, near Basrah	660,000	
Do.	do.	Urea plant at Abu Al-khasib, near Basrah	1,060,000	
Do.	do.	Urea plant at Bayji	500,000	
Do.	State Enterprise for Phosphate (Government, 100%)	Phosphatic fertilizer plant at Al-Qaim	130,000	
Petroleum:				
Crude	thousand 42-gallon barrels per day	BP p.l.c., 66.67%, and China National Petroleum Corp. (CNPC), 33.33%	Rumaila	2,850
Do.	do.	Exxon Mobil Corp., 80%, and Royal Dutch Shell plc, 20%	West Qurna 1	2,325
Do.	do.	Lukoil Oil Co., 85%, and Statoil ASA, 15%	West Qurna 2	1,800
Do.	do.	Royal Dutch Shell plc, 60%, and Petronas Carigali International Sdn Bhd, 40%	Majnoon	1,800
Do.	do.	Eni S.p.A., 44%; Occidental Petroleum Corp., 31%; Korean Gas Corp. (Kogas), 25%	Zubair	1,125
Do.	do.	North Oil Co. (Government, 100%)	Kirkuk	1,000
Do.	do.	CNOOC Ltd., 85%, and Türkiye Petrolleri Anonim Ortaklığı (TPAO), 15%	Missan	450
Do.	do.	China National Petroleum Corp. (CNPC), 50%; Petronas Carigali International Sdn Bhd, 25%; South Oil Co. and Total S.A., 25%	Halfaya	535
Do.	do.	Sociedade Nacional de Petróleos de Angola (Sonangol), 100%	Qiayarah	120
Do.	do.	Gazprom OAO, 40%; Korean Gas Corp. (Kogas), 20%, and Türkiye Petrolleri Anonim Ortaklığı (TPAO), 10%	Badra	170
Do.	do.	Sociedade Nacional de Petróleos de Angola (Sonangol), 100%	Najmah	110
Do.	do.	China National Petroleum Corp. (CNPC), 75%, and State Oil Marketing Organization (SOMO), 25%	Al-Ahdab	90
Refinery products	42-gallon barrels per day	Midland Refineries Co. (Government)	Daura refinery at Daura	142,300
Do.	do.	North Refineries Co. (Government)	Baiji (Salahudin)	135,800
Do.	do.	do.	Baiji (North)	170,000
Do.	do.	do.	Kirkuk	30,000
Do.	do.	do.	Haditha	16,000
Do.	do.	do.	Khanagin/Alwand	12,000
Do.	do.	do.	Qaiyarah-Mosul	4,000
Do.	do.	Kar Oil & Gas Co. (private)	Erbil	40,000
Do.	do.	South Refineries Co. (Government)	Basra	142,300
Do.	do.	do.	Najaf	30,000
Do.	do.	do.	Nassiriyah-Samawah	30,000
Do.	do.	do.	Muftiah	4,500
Phosphate rock		General Company for Phosphate (Government)	Akashat	NA
Sulfur		Misraq Sulphur State Enterprise (Government)	Qaiyarah	820,000

Do., do. Ditto. NA Not available.

