



2008 Minerals Yearbook

UNITED ARAB EMIRATES

THE MINERAL INDUSTRY OF THE UNITED ARAB EMIRATES

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The United Arab Emirates (UAE)¹ was one of the world's top producers of crude oil and accounted for 3.6% of world crude oil production in 2008. The UAE held 97.8 billion barrels of proven crude oil reserves, which was about 7.8% of the world's total, and ranked seventh in the world in terms of the size of its proved crude oil reserves. The UAE was responsible for 1.6% of the world's supply of natural gas; it held 6.43 trillion cubic meters of proved natural gas reserves, or 3.5% of the world's total, and was ranked seventh in the world in terms of the size of its proved natural gas reserves. The UAE was a major supplier of aluminum foundry alloy, extrusion billet, and high-purity aluminum to 300 clients in 48 countries. It produced about 2.3% of the world's smelter output and held about 2.1% of the world's aluminum production capacity at yearend 2008. The UAE was a significant importer of minerals in 2008; it was the world's leading importer of rebar and accounted for 27.3% of world imports (Arab Steel, 2009; Bray, 2009, p. 17; BP p.l.c., 2009, p. 6, 8, 22, 24; Dubai Aluminum Company Ltd., 2009).

Minerals in the National Economy

In 2008, the gross domestic product (GDP) of the UAE grew at a rate of 7.4% at constant 2000 prices, which included an expansion of 12.1% in the hydrocarbon sector; 7.1% in the quarrying sector; 4.5% in the manufacturing sector (which includes the production of mineral-based commodities); and 6.7% in the construction sector. Overall, the non-oil GDP grew at a rate of 3.9% in 2008. The value of economic activity in the fuel minerals sector accounted for 36.8% of the GDP in 2008 compared with 33.5% in 2007. The value of economic activity in the nonfuel minerals sector accounted for 0.2% of the GDP, which was unchanged from the previous 5 years. The contribution of the manufacturing sector was 12.1% of the GDP compared with 12.7% of the GDP in 2007, and that of the construction sector was 7.4% of the GDP in 2008 compared with 7.2% in 2007 (Ministry of the Economy, 2009).

Production

The UAE's production of cement, chromite ore, and steel increased significantly in 2008, whereas the output of aluminum, crude oil, and natural gas was only slightly greater than in 2007 (table 1).

Structure of the Mineral Industry

The governments of the individual Emirates of the UAE maintained majority interest in the country's mineral industry.

¹The United Arab Emirates is a federation of seven emirates: Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain.

In the Emirate of Abu Dhabi, the Supreme Council of Petroleum was the highest government body that made policies and set goals for Abu Dhabi's hydrocarbon sector. Hydrocarbons were produced primarily in the Emirate of Abu Dhabi, mainly through the 14 subsidiaries of Abu Dhabi National Oil Co. (Adnoc). Exploration and production of oil and gas were carried out by Abu Dhabi Company for Onshore Oil Operations (Adco), Abu Dhabi Marine Operating Co. (Adma-Opco), and Zakum Development Co. (Zadco); companies that provided exploration and production services included Abu Dhabi Petroleum Ports Operating Co., Musafah Offshore Supply Base (Esnaad), and National Drilling Co.; oil and gas processing was conducted by Abu Dhabi Gas Industries Ltd. (Ggasco), Abu Dhabi Gas Liquefaction Ltd. (Adgas), and Abu Dhabi Oil Refining Co. (Takreer); chemical and petrochemical manufacturing companies included Ruwais Fertilizer Industries (Fertil) and Abu Dhabi Polymers Co. Ltd. (Borouge); and the distribution of refined petroleum products was the responsibility of ADNOC-Distribution (Abu Dhabi National Oil Co., 2009).

The government of the Emirate of Dubai owned the country's sole primary aluminum producer, Dubai Aluminum Company Ltd. (Dubal). Some of the cement companies were owned by individual Emirate governments, such as the governments of the Emirate of Ras Al Khaimah and the Emirate of Sharjah; other cement plants were owned by private and joint-venture companies. The federal Ministry of the Economy regulated the country's mineral resources and monitored the implementation of laws and agreement obligations of companies operating in the mineral sector (table 2).

Mineral Trade

The overall trade balance of the UAE continued to be on the positive side in 2008, and the country achieved a 35.5% increase in its trade surplus compared with that of 2007. The value of UAE exports of crude oil, condensate, and petroleum products increased in 2008 to \$102.2 billion² (which was about 47.6% of total exports and reexports) from \$73.8 billion in 2007 (which represented about 48.1% of 2007's total exports and reexports). Much of the increase in the value of hydrocarbon exports was owing to the increase in the price of crude oil, which, for the UAE, averaged \$90.00 per barrel in 2008 compared with \$70.70 per barrel in 2007. Natural gas exports were valued at \$10.6 billion in 2008 compared with \$7.8 billion in 2007. Refined petroleum products exports increased to \$6.0 billion in 2008 from \$5.4 billion in 2007 (Central Bank of the United Arab Emirates, 2009, p. 7).

²Where necessary, 2008 values have been converted from United Arab Emirates dirham (Dh) to U.S. dollars (US\$) at the rate of Dh 3.6725= US\$1.00.

The value of U.S. imports of the UAE's aluminum products decreased by 24% to \$241.5 million in 2008 from \$317 million in 2007 and represented 18.8% of total U.S. imports from the UAE in 2008. U.S. crude oil imports were valued at \$161.6 in 2008 (or 12.6% of total U.S. imports from the UAE), which was down from \$267 million in 2007. U.S. imports of gem diamond increased by 35% to \$142.5 million in 2008 and represented 11.1% of total U.S. imports from the UAE. Advanced iron and steel products imports were valued at \$65.6 million, which represented an increase of 46.5% compared with imports in 2007 (Workman, 2009).

Steel imports by the UAE had been increasing steadily by about 1 million metric tons per year (Mt/yr) in the period between 2003 and 2007. In 2008, the UAE was the world's leading importer of steel concrete-reinforcing bar, which was valued at \$6.77 billion. Sixty-seven percent of the UAE's steel imports came from Turkey and 12% came from China (Arab Steel, 2009).

The value of gold trade at the Dubai Multi Commodities Center (DMCC) continued to increase in 2008 to \$29 billion, which was an increase of 53% compared with a value of \$19 billion in 2007. The volume of gold exports in 2008 was 371 metric tons (t) compared with 287 t in 2007, which was an increase of 29%. The volume of gold imports in 2008 increased to 674 t from 559 t in 2007, which was an increase of 21%. India and Switzerland were the top exporters of gold to the UAE, and India and the United Kingdom were the top importers of gold from the UAE (Dubai Multi Commodities Center, 2009).

The value of trade for polished diamond at the DMCC was \$5.29 billion during the first half of 2008, including \$2.35 billion of diamond exports and \$2.94 of diamond imports. Belgium, India, and Hong Kong were the UAE's top diamond-trading countries in terms of the value of trade. Although the value of diamond exports and imports were 99% and 153% more, respectively, than in the first half of 2007, diamond trade apparently declined considerably during the second half of 2008 because of the global economic downturn. No data were available from the DMCC on diamond trade statistics in the second half of 2008 (Dubai Multi Commodities Center, 2008).

Commodity Review

Metals

Aluminum.—Dubai was the world's seventh ranked producer of aluminum and had the largest single-site aluminum smelter operations in the Western World at Jebel Ali in the Dubai Emirate. In 2008, Dubai's production reached about 920,000 t of hot metal, which was 3.4% more than its output in 2007. In February 2008, Dubai started operating an eighth potline, which had a 2,782-kilogram-per-day capacity with 96% efficiency. The company, which employed 4,166 people, consumed 1.84 million metric tons (Mt) alumina and 300,000 metric tons per year (t/yr) of petroleum coke (Dubai Aluminum Company Ltd., 2009).

In January 2008, construction began at Emirates Aluminium Co. Ltd. (Emal)'s aluminum smelter complex in the industrial zone of Khalifah Port, which is located in Taweelah, Abu Dhabi. Emal was founded in 2007 as a 50-50 joint-venture between

Dubai and Mubadala Development Co. PJSC (Mubadala). The first phase of the project was expected to be completed in April 2010 with a production capacity of 740,000 t/yr of primary aluminum at an estimated cost of \$5.7 billion. The plant had 2 potlines, 756 reduction cells, and a dedicated 2,000-megawatt (MW)-capacity powerplant, which would use natural gas supplied by Adnoc through a gas-insulated substation to generate electricity. The plant would include an anode manufacturing unit and a multiple products casting house (Emirates Aluminum Co. Ltd., 2009).

To secure a long-term supply of alumina for its smelter, Dubai formed a joint-venture company, Guinea Alumina Corp. Ltd., in 2007 with BHP Billiton Ltd. of Australia (33.3% interest), Global Alumina Corp. of Canada (33.3% interest), and Mubadala (7.5% interest) to develop and operate the Sangaredi Refinery Project in the Republic of Guinea in West Africa. The initial alumina production capacity of the project was set at 3 Mt/yr, which would be produced from bauxite supplied by a 9-Mt/yr-capacity bauxite mine in the vicinity of the Sangaredi refinery. Dubai had 25% interest and was expected to receive 40% of the alumina produced in the first and second phases of the project. The \$2.4 billion project had been scheduled to commence production in 2009, but production was delayed until 2010 because of increased construction material prices and the restructuring of project financing, which raised the project's cost to \$3 billion (BHP Billiton Ltd., 2007; Husain, 2007).

Abu Dhabi Basic Industries Corp. (Adbic) signed a memorandum of understanding with Midal Cables Ltd. in July 2008 to form a \$100 million joint-venture company that would build an aluminum cables plant in Taweelah, Abu Dhabi. The plant would receive its molten metal from the Emal smelter, which was being built at Taweelah, to produce 150,000 t/yr of aluminum rods (Abu Dhabi Basic Industries Corp., 2008).

Gulf Fluor L.L.C., which was a local private company, began building a new fluoride plant in the Abu Dhabi Industrial City 2 in 2007. The plant was expected to produce 60,000 t/yr of aluminum fluoride and 10,000 t/yr of hydrofluoric acid. The plant, which was expected to be completed in the third quarter of 2009 at a cost of \$500 million, was to satisfy the increased demand for aluminum fluoride created by the Dubai smelter and the future demand of the Emal smelter (Arabian Business, 2007).

Copper.—Dubai Cable Co. Pvt Ltd. (Ducab), which was a subsidiary of the Abu Dhabi government's General Holding Corp. (GHC) and was jointly owned by the governments of Abu Dhabi and Dubai, was the only cable manufacturer in the UAE. In 2008, Ducab had three plants for copper production and wire cable manufacture—one at Jebel Ali in Dubai and two at the industrial city of Musaffah in Abu Dhabi. Ducab had an annual capacity to produce cables containing 110,000 t/yr of copper. In June 2008, Ducab inaugurated a copper rod plant, which was the first of its kind in the UAE. The \$34 million plant was located near the Ducab Musaffah 1 plant. The copper plant converted raw copper cathode into 8-millimeter (mm)-diameter electrolytic tough pitch copper cables. Ducab formed a joint venture with Abu Dhabi Water and Electricity Authority (ADWEA) to build a 30,000-t/yr-capacity high-voltage cables plant. The plant was expected to commence production of high-voltage cables ranging from 66 kilovolts to 400 kilovolts by yearend

2010. Ducab controlled almost one-half of the cable market in the UAE and benefited from the decrease in copper prices in the second half of 2008 and the increased demand for cables made of copper. The company planned to expand production to neighboring markets, including Qatar and Saudi Arabia (Metals Insider, 2008; Dubai Cable Co. Pvt Ltd., 2009; Husain, 2009).

Iron and Steel.—In 2008, Emirates Steel Industries (ESI), which was a subsidiary of Adbic and wholly owned by the Government of Abu Dhabi, was building two 1.6-Mt/yr-capacity direct-reduced iron (DRI) plants at the Industrial City of Abu Dhabi. The first plant was expected to be completed in 2009, and the second plant, in 2011 (Midrex Technologies Inc., 2009, p. 10). ESI moved forward with its plan to build the first integrated steel complex in the country that would use the latest models of electric arc furnace (EAF), DRI, and rolling mill technology to produce reinforcing bars and wire rod. The company's expansion plans were expected to raise its combined production capacity of billets, DRI, rebar, and wire rod products to 3 Mt/yr by 2011. By the end of 2009, ESI would have an output capacity of about 2 Mt/yr of rebar compared with 650,000 t in 2006. The company's production capacity was expected to reach 3 Mt/yr of steel products by 2012 and 6.5 Mt/yr by 2013 once the two phases of expansions are fully implemented (Arab Steel, 2009).

Al Nasser Industrial Enterprises LLC had three steel manufacturing subsidiaries in the UAE—Emirates Steel Establishment, Euro Gulf Steel Industries, and Gulf Steel Industries Co. Ltd. Gulf Steel built a rebar mill supplied by Siemens VAI in the Musaffah Industrial Zone in Abu Dhabi. The rebar line, which was designed to produce 400,000 t/yr of carbon steel bars, was scheduled to begin operating in early 2009. Emirates Steel Establishment, which began as a 20,000-t/yr-capacity ingots feeder unit for Gulf Steel, added a second unit with 40,000 t/yr of capacity and was in the process of adding a third unit that would include an EAF, a ladle furnace, and a concast that would have the capacity to produce 250,000 t/yr of steel billets (Al Nasser Industrial Enterprises LLC, 2009).

Hamriyah Steel FZC, which was a joint venture of Metalloinvest Steel, LLC of Russia and the UAE Government, continued building a rebar mill in the Sharjah Emirate. The equipment for the \$156 million plant was supplied by SMS Meer S.p.A. of Italy, which was a subsidiary of SMS Meer GmbH of Germany. The steel mill was designed to produce 1 Mt/yr of rebar from billets supplied by Ural Steel of Russia, which was a subsidiary of Metalloinvest; it was scheduled to produce 700,000 t in 2010 and 1 Mt in 2011 (Steel Guru, 2009).

RAK Steel inaugurated rebar production in March 2008 from the new plant at Al Ghail, which is located in the Emirate of Ras Al Khaimah. RAK Steel was a joint venture of Middle East Traders Group and Ras Al Khaimah Investment Authority. The \$50 million plant had a capacity of 50,000 t/yr and was the second ranked rebar producer in the UAE after the ESI rebar plant at Musaffah, Abu Dhabi (Steel Guru, 2008).

In June, Macsteel Gulf FZCO was established as a 50-50 joint venture of Alam Steel Industries LLC. (a Dubai-based company) and Macsteel S.A. of South Africa to build a plant that would process high-grade steel plates at the Jebel Ali Free Zone in Dubai Emirate. The Macsteel Gulf plant was expected to reach

a production capacity of 100,000 t/yr of finished products within 5 years starting in 2009; Alam Steel had been operating a 500,000-t/yr-capacity rebar processing plant in Dubai Investment Park (Foreman, 2008; John, 2008).

In October 2008, Murray & Roberts Steel (Pty) Ltd. announced a plan to build a 300,000-t/yr-capacity rebar plant in Dubai Industrial City. The company had an existing 150,000-t/yr-capacity plant in the Emirate of Sharjah (O'Sullivan, 2008).

Qatar Steel Co. Q.S.C. of Qatar operated a rebar and coil processing plant at Jebel Ali in Dubai through its subsidiary Qatar Steel Co. FZE, which produced 102,000 t of coil in 2008. Qatar Steel sold 11% of its total rebar production to the UAE market and was in the process of upgrading the wire rod and bar mills in Dubai (Qatar Steel Co. Q.S.C., 2009, p. 13, 30).

Industrial Minerals

Cement.—In 2008, cement production in the UAE amounted to 13.2 Mt, which was 28% less than the local demand of about 18.2 Mt. Cement consumption was expected to increase by 25% to 23 Mt by 2010. The Union Cement Co. at Ras Al Khaimah, which was the cement market leader, produced 3.1 Mt of clinker and 3.0 Mt of cement; it was followed by Ras Al Khaimah Cement Co., which produced 1.0 Mt of clinker and 1.2 Mt of cement. The UAE imports of cement were about 5 Mt in 2008, which was 67% more than the 3.0 Mt imported in 2007; 194% more than the 1.7 Mt imported in 2006; and 733% more than the 0.6 Mt imported in 2005 (United Arab Emirates Cement, 2009).

Nitrogen.—Ruwais Fertilizer Industries Ltd., which was a joint venture of Adnoc (67% interest) and Total S.A. of France (33% interest) moved forward with its Fertil-1 debottlenecking expansion plan for the ammonia and urea complex in the Ruwais Industrial Zone, which was located 235 kilometers (km) from Abu Dhabi. The expansion would increase the plant's urea production capacity by 50% to 1 Mt/yr of urea; 70% of the output would be used by the Abu Dhabi Polymers Co.'s melamine plant that was being built in the vicinity, and the remaining 30% would be granulated and marketed as nitrogen fertilizer. The urea debottlenecking project was expected to be completed in July 2009.

A new \$1.2 billion ammonia and urea production plant, Fertil-2, was planned to be built near the existing Fertil-1 plant. Fertil-2 would have a total production capacity of 1.3 Mt/yr of urea and 700,000 t/yr of ammonia. The combined capacity of the two plants when both projects are completed in January 2013 would be 1.9 Mt/yr of granulated urea and 1.2 Mt/yr of ammonia (Chemicals Technology, 2008; Ruwais Fertilizer Industries Ltd., 2008; Ashqar, 2009, p. 17).

Silica.—In 2008, Emirates Float Glass LLC, which was a subsidiary of Glass LLC and wholly owned by Dubai Investment PJSC, began production at its first float glass plant in Abu Dhabi and broke ground for its second float glass plant at the Industrial City 2 of Abu Dhabi. The second plant was expected to commence production in 2010. By 2010, the company would have two float glass plants in Abu Dhabi with a combined cost of \$400 million and production capacity of 12,000 metric tons per day of architectural and automotive glass.

In August 2008, Emirates Float Glass was granted a technology licensing agreement from PPG Industries of the United States for its second plant in Abu Dhabi (Al Bawaba Group, 2008).

Sulfur.—Production of sulfur as a byproduct of petroleum refining and natural gas processing had been on the rise in recent years. In 2008, Adnoc produced 1.8 Mt of sulfur whereas Abu Dhabi Gas Liquefaction Co. (Adgas) produced 375,000 t of liquid sulfur. UAE sulfur production was expected to increase sharply to about 7 Mt/yr when the natural gas projects planned by Adnoc are completed between 2009 and 2012 (Ashqar, 2009, p. 30, 41).

Mineral Fuels and Other Sources of Energy

Coal.—In July 2008, the Government of the Emirate of Ajman signed an agreement with MMC Corp. Bhd of Malaysia to establish the first coal-fired powerplant in the Gulf region. The \$2 billion plant was expected to have the capacity to generate 1 gigawatthour of electricity and to commence production in 2012. In December 2008, Ras Al-Khaimah Investment Authority was preparing to invite bids for a coal-fired powerplant to be built at Mina Saqr, which is located 110 km northeast of Dubai. The initial capacity of the plant would be 500 to 600 MW; this amount could increase to 4,000 MW in the final phase of the project (Carlisle, 2008; Maree, 2008).

Natural Gas.—According to the U.S. Energy Information Administration, the UAE was a net natural gas importer in 2008. UAE imported natural gas from Qatar through the Dolphin pipeline to satisfy the country's increased demand for gas. The natural gas deficit started in 2007 because of the increased demand for gas by powerplants, water desalination plants, petrochemical plants, and an enhanced oil recovery process, which included injecting mature oilfields with natural gas (U.S. Energy Information Administration, 2009).

In August 2008, Adnoc signed an interim agreement with ConocoPhillips Co. of the United States to develop the Shah sour gasfield, which is located 180 km southwest of the city of Abu Dhabi. Under the interim agreement, which would give Adnoc 60% interest and ConocoPhillips 40% interest in the project, the two companies would share the cost of the project's front-end engineering design. The development of the Shah project would include the building of a 10-billion-cubic-meter-per-year-capacity natural gas processing plant. The gas produced at Shah would be desulfurized and transported through 275 km of pipelines from Shah to Habshan and Ruwais. The sulfur would either be transported in a liquid form by pipelines similar to natural gas or granulated at Shah before being transported by rail to Ruwais (ConocoPhillips Co., 2008).

In October 2008, Dolphin Energy Ltd., which was owned by Mubadala (51%), Occidental Petroleum Corp. of the United States, and Total S.A. of France (24.5% each), delivered its first gas to Oman as part of a 25-year gas sales agreement between Dolphin and Oman Oil Co. signed in 2005. Earlier in the year (in April), Dolphin had delivered its first gas to the Emirate of Sharjah. Dolphin received the gas produced from the offshore gasfields of Qatar; treated and compressed it at Ras Laffan, Qatar, and then transported it undersea to the Taweelah receiving facilities in Abu Dhabi through the company's export pipeline. Dolphin moved forward with the construction of the

Taweelah to Fujairah Gas Pipeline (TFP). The TFP project included building a 1.20-meter-diameter pipeline that extends 240 km across the United Arab Emirate's desert and mountain areas. The project was being built with PJSC Stroytransgaz of Russia and was expected to be completed in the third quarter of 2010 (Dolphin Energy Ltd., 2009).

Nuclear Energy.—In 2008, the Government issued a white paper entitled "Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy." The paper outlined the UAE's comprehensive policy on the development of nuclear energy for peaceful domestic power generation in partnership with the International Atomic Energy Agency and its commitment to the highest levels of nonproliferation, safety, security, and sustainability. The Government was preparing for the creation of the Emirates Nuclear Energy Corp. as an entity that would manage the country's future nuclear program (Emirates Nuclear Energy Corp., 2008).

Petroleum.—The full field development of the UAE's largest oilfield, the Upper Zakum oilfield, was one of the Government's main priorities. Adnoc, Exxon Mobil Corp. of the United States, and Japan Oil Development Co. were partners in the Upper Zakum oilfield development project to increase its production capacity to 750,000 barrels per day (bbl/d) from 550,000 bbl/d by the year 2015 and ultimately to 1.2 million barrels per day. The development of the Umm Shaif offshore oil and gas project started in 2007 and continued through 2008. The aim of the project was to increase oil production to 300,000 bbl/d by 2010 (U.S. Energy Information Administration, 2009).

In December 2008, China National Petroleum Corp. (CNPC) and International Petroleum Investment Co. (IPIC) signed an engineering, procurement, and construction contract for the Abu Dhabi Crude Oil Pipeline (ADCOP). ADCOP was a 400-km-pipeline that would carry oil from the Habshan oilfield to the Port of Fujairah on the Gulf of Oman. The \$3.29 billion project would be jointly executed by China Petroleum Engineering & Construction Corp. (CPECC) and China Petroleum Pipeline Bureau (CPPB). It was the largest overseas turnkey engineering construction project for which the CNPC had ever contracted. The project was expected to be completed by August 2011. ADCOP would enable the UAE to export up to 60% of its oil production from the Gulf of Oman, thus bypassing the checkpoints at the Strait of Hormuz and the potential navigation risk in the Gulf of Oman waters (Pipeline & Gas Journal, 2009; U.S. Energy Information Administration, 2009).

Carbon Capturing.—In November 2008, Masdar signed a contract with Mustang Engineering (a subsidiary of John Wood Group p.l.c. of the United States) to provide front-end and engineering design services for the Abu Dhabi Carbon Capture and Storage project. The project included arresting carbon dioxide (CO₂) emissions from industrial and energy plants in Abu Dhabi, transporting the captured CO₂ through pipelines, and reinjecting it in Abu Dhabi's oilfields to boost oil recovery. The first stage of the project comprised reinjection of 5 Mt of CO₂ from three sources of emission by yearend 2013 (Abu Dhabi Future Energy Co., 2008b).

Solar Energy.—In January 2008, Abu Dhabi Future Energy Co. (Masdar), which was wholly owned by Mubadala, devoted

\$15 billion for investment in alternative energy projects. The projects would include commercialization, development, exploration, and manufacturing of hydrogen, solar, and wind energy sources as well as carbon reduction and recycling technology. Masdar began construction of concentrating solar powerplants (CSPs) in Abu Dhabi; the first of such plants, Shams1, was expected begin generating power from solar energy by yearend 2010. In March 2008, Masdar and Sener Grupo de Ingeniería S.A. of Spain formed a joint venture named Torresol Energy to design, build, and manage CSPs in the “sunbelt” regions of the world.

In May 2008, Masdar announced a \$2 billion investment in a three-step thin-film photovoltaic solar technology project. The first step of the project consisted of constructing two photovoltaic production plants. The first plant, which broke ground in August in Erfurt, Germany, at a cost of \$230 million, was expected to start production of solar energy in the third quarter of 2009. The plant would serve as a pilot project and a demonstration of technology transfer to the bigger plant to be built in Abu Dhabi, which was expected to begin initial production in the second quarter of 2010. The combined production capacity of the two plants would be 210 MW (Abu Dhabi Future Energy Co., 2008a, c).

Outlook

The economic prosperity and diversity of the UAE is expected to continue in the next 5 years but perhaps at a more modest rate than the robust rate of growth of the previous 5 years. The mineral industry of the UAE is expected to continue to grow to satisfy the increased demand for minerals required for economic growth. The government of Abu Dhabi Emirate is planning massive investment in infrastructure and the manufacturing sector, including developing natural gasfields and oilfields; carbon capturing; producing hydrogen energy; and developing nuclear, solar, and wind energy projects to satisfy the increasing demand for energy. Production of aluminum, cement, float glass, natural gas, nitrogen fertilizer, steel, and sulfur is expected to increase significantly when the current expansion projects are completed.

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TABLE 1
UNITED ARAB EMIRATES: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Thousand metric tons unless otherwise specified)

| Commodity ³ | 2004 | 2005 | 2006 | 2007 | 2008 | |
|--|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| METALS | | | | | | |
| Aluminum, primary | 683 ⁴ | 722 ⁴ | 861 ⁴ | 890 ⁴ | 920 ⁴ | |
| Chromite ore | 7 ^{r,4} | (5) | (5) | 19 ⁴ | 34 ⁴ | |
| Steel, crude | 90 | 90 | 90 | 90 | 100 | |
| INDUSTRIAL MINERALS | | | | | | |
| Cement, hydraulic | 9,000 | 10,000 | 11,000 ^r | 12,000 ^r | 13,200 ⁴ | |
| Gypsum | 110 | 120 | 130 | 150 | 160 | |
| Lime | 50 | 50 | 60 | 60 | 60 | |
| Nitrogen: | | | | | | |
| N content of ammonia | 380 | 360 | 380 | 380 | 380 | |
| N content of urea | 270 | 260 | 270 | 270 | 270 | |
| Sulfur ⁶ | 1,930 | 1,950 | 1,950 | 1,950 | 2,175 ⁴ | |
| MINERAL FUELS AND RELATED MATERIALS | | | | | | |
| Gas, natural: | | | | | | |
| Gross | million cubic meters | 68,030 ^{r,4} | 70,470 ^{r,4} | 76,194 ^{r,4} | 78,963 ^{r,4} | 80,550 ⁴ |
| Dry | do. | 46,290 ^{r,4} | 47,790 ^{r,4} | 48,790 ^{r,4} | 50,290 ^{r,4} | 50,240 ⁴ |
| Natural gas plant liquids | thousand 42-gallon barrels | 146,000 | 114,000 | 114,000 | 114,000 | 114,000 |
| Petroleum: | | | | | | |
| Crude | do. | 855,000 | 868,000 | 937,000 | 933,000 | 951,660 ⁴ |
| Refinery products: | | | | | | |
| Liquefied petroleum gas | do. | 1,500 ^r | 1,600 | 1,600 ^r | 2,000 | 3,600 |
| Gasoline | do. | 15,000 ^r | 16,000 ^r | 22,000 ^r | 20,000 ^r | 18,000 |
| Kerosene | do. | 43,000 ^r | 43,000 ^r | 43,000 ^r | 39,000 ^r | 39,000 |
| Distillate fuels | do. | 35,000 ^r | 32,000 ^r | 33,000 ^r | 32,000 ^r | 31,000 |
| Residual fuels | do. | 9,000 ^r | 9,000 ^r | 8,000 ^r | 7,000 ^r | 6,000 |
| Other | do. | 59,000 ^r | 62,000 ^r | 49,000 ^r | 45,000 ^r | 50,000 |
| Total | do. | 163,000 ^r | 164,000 ^r | 157,000 ^r | 145,000 ^r | 148,000 |

¹Revised. do. Ditto.

²Estimated; estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

³Table includes data available through January 31, 2010.

⁴In addition to the commodities listed, crude industrial minerals, such as common clays, diabase, gravel, limestone, marble, sand, and shale presumably are produced, but output is not reported, and information is inadequate to make reliable estimates of output.

⁵Reported figure.

⁶Negligible or no production.

⁷Byproduct of petroleum refining and natural gas processing.

TABLE 2
UNITED ARAB EMIRATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|------------------------|--|---|---|--------------------|
| Aluminum | | Dubai Aluminum Company Ltd. (Dubal) (Investment Corporation of Dubai, 100%) | Jebel Ali, Dubai | 950 |
| Cement: | | | | |
| Portland | | Gulf Cement Company (National Investments Company of Kuwait, 27%, and Government of Ras Al Khaimah, 8%) | Khor Khuwair, Ras Al Khaimah | 2,700 |
| Do. | | Sharjah Cement and Industrial Development Co. (private, 70%, and Government of Sharjah, 30%) | Sharjah | 3,000 |
| Do. | | National Cement Company P.S.C. | Dubai | 1,500 |
| Do. | | National Cement Factory | Abu Dhabi | 2,500 |
| Do. | | Union Cement Co. (Government of Ras Al Khaimah, 41%, and Abu Dhabi Investment Authority, 20%) | Khor Khuwair, Ras Al Khaimah | 4,200 |
| Do. | | Fujairah Cement Industries | Dibba, Fujairah | 3,100 |
| Do. | | Emirates Cement Factory (General Holding Corp.) | Al-Ain, Abu Dhabi | 2,200 |
| Do. | | Ras Al Khaimah Cement Co. | Khor Khuwair, Ras Al Khaimah | 1,200 |
| Do. | | Arabian Gulf Cement Company LLC | Ajman | 900 |
| Do. | | Jebel Ali Cement Co. (Sharaf Industries, 100%) | Jebel Ali, Dubai | 800 |
| Do. | | Umm al-Qaywayn Cement Industries Co. | Umm al-Quwain | 1,600 |
| White | | Ras Al Khaimah Company for White Cement and Construction Materials | Ras Al Khaimah | 500 |
| Gold, refined | metric tons | Emirates Gold (private, 100%) | Dubai | 200 |
| Do. | do. | Al Ghurair Giga Gold (private, 100%) | do. | 100 |
| Do. | do. | ARY Aurum Plus (private, 100%) | Sharjah | 25 |
| Do. | do. | Al Ghaith Gold (private, 100%) | Dubai | 100 |
| Iron and steel: | | | | |
| Direct-reduced | | Emirates Steel Industries (ESI) | Abu Dhabi | 1,600 ^P |
| Do. | | Al Nasser Industrial Enterprises LLC | do. | 250 ^P |
| Steel: | | | | |
| Billet | | Emirates Steel Industries (ESI) | do. | 1,500 ^P |
| Do. | | Al Nasser Industrial Enterprises LLC | do. | 220 ^P |
| Wire rod | | Emirates Steel Industries (ESI) | do. | 480 ^P |
| Rebar | | do. | do. | 620 ^P |
| Do. | | Alam Steel | Dubai | 500 |
| Do. | | Al Nasser Industrial Enterprises LLC | Abu Dhabi | 90 ^P |
| Do. | | Essar Steel-India | Hamriyah Free Zone, Sharjah | 1,000 ^P |
| Do. | | Metalloinvest-Russia | do. | 1,000 ^P |
| Do. | | Union Iron & Steel Company LLC | Abu Dhabi | 500 ^P |
| Do. | | Conares Metal Supply Ltd. | Dubai | 400 ^P |
| Do. | | Star Steel International LLC | Jebel Ali, Dubai; Hamriyah Free Zone, Sharjah | 360 ^P |
| Natural gas, liquefied | | Abu Dhabi Gas Liquefaction Company Ltd. | Das Island | 5,149 |
| Petroleum: | | | | |
| Crude | thousand 42-gallon barrels per day | Abu Dhabi Company for Onshore Oil Operations (Adco) [Abu Dhabi National Oil Co. (Adnoc), 60%; BP p.l.c., 9.5%; Exxon Mobil Corp., 9.5%; Royal Dutch Shell Group, 9.5%; Total S.A., 9.5%; Participations and Explorations Corp., 2%] | Onshore Abu Dhabi oilfields, including the Asab, the Bab, the Bu Hasa, the Jarn Yaphour, the Sahil, the Shah, Abu Al Bukhoosh, and the Arzanah fields | 1,300 |
| Do. | do. | Abu Dhabi Marine Operating Co. (Adma-Opeco) [Abu Dhabi National Oil Co. (Adnoc), 60%; BP p.l.c., 14.67%; Total S.A., 13.33%; Japan Oil Development Corp., 12%] | Offshore Abu Dhabi oilfields, including the Umm Sharif and the Zakum fields | 600 |
| Do. | do. | Zakum Development Co. (Zadco) [Abu Dhabi National Oil Co. (Adnoc), 63.36%; ExxonMobil Abu Dhabi Offshore Petroleum Company Ltd., 24.64%; Japan Oil Development Corp., 12%] | Offshore Abu Dhabi oilfields, including the Satah, the Umm Al-Dalkh, and the Upper Zakum fields | 518 |

See footnotes at end of table.

TABLE 2—Continued
 UNITED ARAB EMIRATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|----------------------|--|---|--|--------------------|
| Petroleum—Continued: | | | | |
| Crude—Continued | thousand 42-gallon barrels per day | Dubai Petroleum Co. (100%) | Dubai oilfields, including the Margham, the Falah, the Fateh, the Rashid, and S.W. Fateh fields | 100 |
| Do. | do. | Ras Al Khaimah Gas Commission | Ras Al Khaimah oilfields, including the Saleh field | 1 |
| Do. | do. | BP p.l.c. and Crescent Petroleum Company Inc. | Sharjah oilfields, including the Kahaif, the Saja, the Moveyid, and the Mubarek fields | 50 |
| Refined products | do. | Abu Dhabi Oil Refining Co. (Takreer) [Abu Dhabi National Oil Co., (Adnoc), 100%] | Ruwais refinery, Ruwais, Abu Dhabi | 350 |
| Do. | do. | Emirates National Oil Company Ltd. (Investment Corporation of Dubai, 100%) | Jebel Ali refinery, Jebel Ali, Dubai | 120 |
| Do. | do. | Abu Dhabi Oil Refining Co. (Takreer) [Abu Dhabi National Oil Co. (Adnoc), 100%] | Abu Dhabi refinery, Umm Al Nar, Abu Dhabi | 150 |
| Do. | do. | Sharjah Oil Refining Co. F.Z.C. (FAL Group, 100%) | Sharjah refinery, Hamriyah Free Trade Zone | 71 |
| Do. | do. | Inactive refinery, formerly operated by Metro Oil Corp. | Fujairah | 90 |
| Silica, glass | metric tons | Guardian Zoujaj International Float Glass Co. LLC (Guardian RAK) | Ras Al Khaimah | 255,500 |
| Do. | do. | Emirates Float Glass LLC (Dubai Investment PJSC, 100%) | Industrial City 1 and 2, Abu Dhabi | 440,000 |
| Silver, refined | do. | Emirates Gold (private, 100%) | Dubai | 100 |

^pPreliminary. Do., do. Ditto.