



# 2006 Minerals Yearbook

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## IRAN

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# THE MINERAL INDUSTRY OF IRAN

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Iran had an extensive mineral production and processing sector. Iran's hydrocarbon sector, which included the production of natural gas and oil, the refining of crude oil, and the distribution of hydrocarbons, was a significant facet of the country's economy. According to the U.S. Energy Information Administration (2007), Iran was the world's fourth ranked producer of crude oil. Iranian crude oil and condensate production averaged about 4 million barrels per day in 2006, or about 5.5% of the world's output. The country also was estimated to account for more than 1% of the world's output of cement, chromium, refined copper, and fluorspar (table 1; Edelstein, 2007, p. 21.25-21.27; Miller, 2008; Papp, 2008; van Oss, 2008).

## Minerals in the National Economy

Production, processing, transportation, and sales of crude oil and natural gas accounted for about 11% of the country's gross domestic product (GDP) at constant prices. Other mineral commodities, which included coal, industrial minerals, and metals, accounted for a minor amount of the GDP (Central Bank of the Islamic Republic of Iran, 2007, p. 3).

## Government Policies and Programs

The Mining Code of 1998, which was based on Articles 44 and 45 of Chapter 4 of the 1978 Constitution of the Islamic Republic of Iran, and various amendments to the Mining Code, regulated the mining sector. In 2004, a reinterpretation of the Constitution allowed private domestic and international investor participation in the mining sector. The Petroleum Act of 1987 clarified the Government's authority in the oil sector. With regard to the provisions of Article 81 of Chapter 6 of the Constitution (which prohibited foreigners from acquiring equity interest in Iran's agriculture, commercial, industrial, mineral extraction, and services sectors), adjustments, such as Note 29 of the First Five-Year Plan, and Note 22 of the Second Five-Year Plan, allowed international companies to participate in Iranian petroleum sector operations under 'buyback' contracts, which were short-term service contracts that authorized international companies to work on oil and natural gas production projects for a defined time period in return for revenue from produced oil and gas. Domestic critics of the controversial program were annoyed because buyback contracts effectively skirted the Constitution. Because most buyback contracts covered the development or redevelopment of the project and the subsequent initial production period, technical concerns were raised concerning the possibility that it would be in the economic interest of foreign commercial companies to overproduce crude oil or natural gas during the contract, which could lead to permanent reservoir damage (Ceragioli and Martellini, 2003; Oil, Gas & Energy Law Intelligence, 2003; McDowall, 2006b).

## Production

Based on estimates of mineral commodity production, significant increases in output in 2006 compared with that of 2005 were projected for bauxite, borax, copper concentrate, copper metal, iron ore, refined lead, perlite, and refined zinc. Declines were projected for ferrochromium, ferrosilicon, and pig iron. Data on estimated mineral production are provided in table 1.

## Structure of the Mineral Industry

The Ministry of Industries and Mines administered all mining, smelting, and refining industries except the oil and gas sectors, which were administered by the Ministry of Petroleum. Basic geologic exploration and most initial evaluations of the nation's mineral resources (except hydrocarbons) were performed by the Geological Survey of Iran.

Most of the country's active mines were privately owned, although the Government retained control of many of the larger mineral commodity companies, especially those that produced aluminum, ammonia, coal, copper, iron and steel, natural gas and oil, salt, and sulfur. In 2006, the Ministry of Industry and Mines announced that it planned to privatize some of the Government's equity interest in Bushehr Cement Co., Chadormalou Mining and Industrial Co., Darab Cement Co., Gol-e-Gohar Iron Ore Co., Iran Aluminium Co., Khuzestan Steel Co., Mobarekeh Steel Co., and National Iranian Copper Industries Co. The Government also reaffirmed its 2004 proposal to address the constitutional ban on international investors acquiring interest in the oil industry and planned to begin to privatize the downstream oil and gas sector (Iran Daily, 2006d; Middle East Economic Digest, 2006g).

## Mineral Trade

The Central Bank of the Islamic Republic of Iran (2007, p. 13) reported that hydrocarbon exports were valued at about \$62.5 billion<sup>1</sup> in Iranian year 1385 (the period from March 21, 2006, to March 20, 2007) compared with a revised value of \$53.8 billion in Iranian year 1384. Crude oil exports accounted for most of the hydrocarbon exports; natural gas and refined petroleum products accounted for the remainder. In Iranian year 1385, hydrocarbons accounted for about 83% of total exports, which were valued at \$75.5 billion. Exports to the United States were limited by the U.S. Government embargo on goods and services of Iranian origin. For the 2006 calendar year, Iranian exports to the United States were valued at \$157 million; no mineral-commodity trade was reported (U.S. International Trade Commission, 2007; U.S. Office of Foreign Assets Control, undated).

<sup>1</sup>Where necessary, values have been converted from Iranian rials (RI) to U.S. dollars (US\$) at the average exchange rate of RI9,197=US\$1.00.

## Commodity Review

### Metals

**Aluminum and Bauxite and Alumina.**—Construction continued on the capacity expansion of Iran Aluminium Co.'s Arak smelter to 250,000 metric tons per year (t/yr) from 120,000 t/yr (Metals Insider, 2006).

The Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) requested bids for the construction of a 200,000-t/yr-capacity alumina plant at Sarab. The facility would process nepheline syenite from Razgah and limestone from Arshtenab. In addition to alumina, the facility was to include a 3.4-million-metric-ton-per-year (Mt/yr)-capacity cement plant, a 116,000-t/yr-capacity potassium carbonate plant, a 36,000-t/yr-capacity soda ash plant, and a 2,800-t/yr-capacity potassium sulfate plant. The winning contractor was expected to arrange the financing for the project. Construction was expected to take 3 to 4 years (Industrial Minerals, 2006).

**Gold.**—The increased international price of gold ignited additional interest in the development of Iran's gold occurrences. IMIDRO requested bids for the construction of the Zarshuran 2-t/yr-capacity gold mine and pressure oxidation plant at Takab. Persian Gold plc of Ireland completed a 17-hole drill program on the Chah-e-Zard prospect in Yazd. Rio Tinto Ltd. of Australia revealed that the results of a feasibility study indicated the Sari Gunay prospect in Kurdistan was not commercially viable. The Geological Survey of Iran reportedly started exploration in the Barika, the Dareh-Zaq, the Khorapeh, the Shahr-e Babak, the Tangviah, and the Zeytounjian areas. Local companies were evaluating gold deposits in the Gandi and the Sharafabad areas (Middle East Economic Digest, 2006d; Reuters, 2006).

**Iron Ore and Iron and Steel.**—Gohar Zamin Iron Ore Co. requested bids for a 5-unit iron ore concentration plant and two direct-reduction iron (DRI) plants. The winning contractor was expected to arrange the financing for the project, which was to be built at the Gol-e-Gohar mining complex. Ore from the Gohar Zamin Mine, which was expected to begin operations in 2008, would feed the 10-Mt/yr-capacity concentration and DRI facility, which was expected to start operations in 2009 (Middle East Economic Digest, 2006c).

Arfa Iron and Steel Co., which was 49% state-owned, requested bids for an 800,000-t/yr-capacity steel plant in Ardakan. Arfa also proposed to build a DRI plant at the facility. Isfahan Steel Co. requested bids on a 300,000-t/yr-capacity expansion of its DRI plant at Esfahan. The winning contractor was expected to arrange the financing for the project, source iron ore feedstock, and arrange for the marketing of the DRI output. National Iranian Steel Co. requested bids on three 800,000-t/yr-capacity DRI plants. Proposed locations of the plants were to be determined at a later date (Middle East Economic Digest, 2006a, b, h).

**Titanium.**—In 2006, IMIDRO proposed to build a 50,000-t/yr-capacity titanium dioxide pigment plant at Kahnuj. The facility also would have a 70,000-t/yr-capacity slag processing plant and a 130,000-t/yr-capacity ilmenite beneficiation plant (Middle East Economic Digest, 2006f).

**Zinc.**—In 2006, Mehdiabad Zinc Co., which was a venture of IMIDRO (50% interest), Iran Itok Engineering and Technology Co. (an affiliate of Itok GmbH of Austria) (25%), and Union Resources Ltd. of Australia (25%), received a completed feasibility study of the Mehdiabad zinc project. In December, IMIDRO notified Union Resources that it had terminated the joint venture because of alleged breaches of contract. Union Resource disputed the notice of termination and attempted to settle the dispute (Union Resources Ltd., 2006).

### Industrial Minerals

**Cement.**—Construction of new cement plants and capacity expansions at existing plants continued; more than 4 Mt/yr of capacity was added in 2006. By 2007, annual Iranian cement production capacity was expected to reach 42 Mt/yr, although production was expected to be about 36 million metric tons. The Government proposed to remove subsidies on cement prices, which resulted in a local price of cement that was equivalent to \$40 per metric ton, compared with an average of about \$100 in other countries in the region (Iran Daily, 2006c; Lidstone, 2007).

**Nitrogen.**—In early 2006, Petrochemical Industries Design and Engineering Co. of Iran won the bid to build new ammonia and urea plants for the Shiraz Petrochemical Co., which was a subsidiary of state-owned National Petrochemical Co. The new facility would include a 1.1-Mt/yr-capacity urea plant and a 670,000-t/yr-capacity ammonia plant. At yearend, Shiraz Petrochemical continued to attempt to secure domestic (Government) financing for the project (Middle East Economic Digest, 2006e).

### Mineral Fuels and Related Materials

**Uranium.**—Limited information was available concerning uranium exploration, which continued in central and northwest Iran. Mining operations reportedly were underway at the Saghand Mine. Recovery of uranium also was reported underway at the Gchine Mine and the closed Meskani and Talmesi copper mines and their tailings piles (International Atomic Energy Agency, 2004, p. 3; Nuclear Threat Initiative, 2006; Atomic Energy Organization of Iran, undated, p. 2, 5).

### Outlook

Numerous development or expansion projects are planned or underway in the aluminum, cement, copper, ferroalloys, gold, iron and steel, magnesium compounds, oil and gas, potash, stone, and zinc sectors, several of which are dominated by large state-owned companies. Although private and state-owned companies have expanded their metals processing operations during the past two decades, significant potential for additional mineral development and value-added beneficiation of minerals remains, especially in the industrial minerals sector (Iran Daily, 2006b; O'Driscoll, 2006).

Increased demand for funding other domestic programs and increased subsidies for cement and petroleum fuels have reduced the availability of Government funding for mineral resource development. The Government had a backlog of about

9,000 development projects in various economic areas that were awaiting Government funding. The acquisition of international funding for capital-intensive development of mineral-related projects by Government-controlled and private companies operating in Iran was impaired, in part, by the Government's continued development of a nuclear-fueled electricity-generating reactor at Bushehr, which adversely affected the country's international relations. The lack of domestic and international funding is affecting the timeliness of mineral development and expansion projects. Such delays historically have resulted in increased construction costs and lost revenues (Iran Daily, 2006a; McDowall, 2006a).

More than 60% of Iranian oil production was exported in 2006. The ratio of oil exports to production, however, has declined each year since 2003, despite increased oil production. Domestic demand for crude oil is expected to continue to increase in the future, which may require Iran to forego hard currency oil exports to meet demand. Planning for the development of identified natural gas and oil resources is expected to continue, subject to funding constraints, limitations imposed by existing (2006) economic sanctions, and the specter of an international embargo on oil exports. The ongoing and often-delayed development of the multiphase South Pars natural gas project is expected to continue for a number of years. New construction and renovation of existing oil refineries is expected to begin during the current 5-year plan (2005 to 2009) (Central Bank of the Islamic Republic of Iran, 2007, p. 7).

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

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>	2002	2003	2004	2005 <sup>e</sup>	2006 <sup>e</sup>
<b>METALS</b>					
<b>Aluminum:</b>					
Bauxite, gross weight	57,254	364,306	366,000	437,595 <sup>r,4</sup>	500,000
Alumina	101,339	102,785	137,002	150,000	150,000
Metal, primary ingot	168,715	182,477	212,602	220,000	220,000
Arsenic, orpiment and realgar, concentrates <sup>c</sup>	400	275	89 <sup>4</sup>	100	100
<b>Chromite, mine output, concentrate</b>					
Gross weight	512,640	97,328	138,755	223,563 <sup>4</sup>	225,000
Cr <sub>2</sub> O <sub>3</sub> content <sup>c</sup>	250,000	48,000	68,000	110,000	110,000
<b>Copper:</b>					
<b>Mine output:</b>					
<b>Ore mined (0.6% to 1.2% Cu):</b>					
Gross weight	15,529	15,084	18,885	19,000	20,000
Cu content <sup>c</sup>	160,000	160,000	190,000	190,000	210,000
<b>Concentrate (29% to 35% Cu):</b>					
Gross weight	394,061	395,036	448,689	480,000 <sup>r</sup>	620,000
Cu content <sup>c</sup>	121,000	130,000	150,000	160,000 <sup>r</sup>	208,000
<b>Metal:</b>					
Smelter output, blister or anode	171,591	168,613	184,814	227,000 <sup>r</sup>	242,000
Refined output, cathode	143,438	145,669	152,463	178,000 <sup>r</sup>	200,000
Gold, mine output, Au content <sup>f</sup>	210	203	195	200	200
<b>Iron and steel:</b>					
<b>Ore and concentrate:</b>					
Gross weight	16,906	18,287	18,205	19,000	21,000
Fe content <sup>c</sup>	8,000	9,000	8,900	9,162 <sup>r,4</sup>	10,000
<b>Metal:</b>					
Pig iron <sup>c</sup>	2,400	2,709 <sup>4</sup>	2,136 <sup>4</sup>	2,300	2,000
Direct-reduced iron	5,280	5,620	6,410	6,850	6,900
Ferrochromium <sup>c</sup>	8,000	10,000	7,750 <sup>4</sup>	8,000	7,000
Ferrosilicon <sup>c</sup>	40,000	40,297 <sup>4</sup>	50,140 <sup>4</sup>	50,000	45,000
Steel, crude, ingots and castings	7,293	7,869	8,382	9,400 <sup>r</sup>	9,800
<b>Lead:</b>					
<b>Mine output, concentrate:</b>					
Gross weight	38,054	39,093	42,018	43,000	47,000
Pb content <sup>c</sup>	19,000	20,000	22,000	22,000	24,000
Refinery output, includes secondary <sup>c</sup>	51,000	58,000	68,000	68,000	75,000
<b>Manganese, mine output (30% to 35% Mn):</b>					
Gross weight	123,148	115,680	128,924	125,000	125,000
Mn content <sup>c</sup>	42,000	38,000	43,000	42,000	42,000
<b>Molybdenum, mine output, concentrate:</b>					
Gross weight	4,271	4,084	3,367	4,603 <sup>r,4</sup>	4,600
Mo content <sup>c</sup>	2,300	2,200	1,800	2,476 <sup>r,4</sup>	2,500
Silver, mine output, Ag content	23	23	25	25	25
<b>Zinc:</b>					
<b>Mine output, concentrate:</b>					
Gross weight	220,000	222,000	244,006	310,000 <sup>r</sup>	300,000
Zn content <sup>c</sup>	120,000	110,000	121,000	167,000 <sup>r</sup>	164,000
Metal	82,571	78,428	109,400	120,000	140,000
<b>INDUSTRIAL MINERALS</b>					
<b>Asbestos:</b>					
Concentrate (3% to 8% marketable fiber)	70,000	98,000 <sup>e</sup>	82,018	40,000 <sup>r</sup>	40,000
Marketable fiber <sup>e</sup>	1,500	1,470 <sup>4</sup>	6,000	1,300 <sup>r</sup>	1,300
Barite	178,652	196,169	275,607	231,184 <sup>r,4</sup>	230,000

See footnotes at end of table.

TABLE 1--Continued  
 IRAN: PRODUCTION OF MINERAL COMMODITIES<sup>1, 2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>	2002	2003	2004	2005 <sup>c</sup>	2006 <sup>e</sup>	
<b>INDUSTRIAL MINERALS--Continued</b>						
Boron, borax	2,079	3,361	2,142	1,660 <sup>r</sup>	2,000	
Cement, hydraulic	thousand metric tons	28,600	30,460	32,198	32,650 <sup>4</sup>	33,000
Clays:						
Bentonite	125,510	140,528	193,046	261,888 <sup>r, 4</sup>	260,000	
Industrial clays <sup>c</sup>	450,000	388,543 <sup>4</sup>	578,750 <sup>4</sup>	550,000	550,000	
Kaolin	553,782	484,501	531,109	311,501 <sup>r, 4</sup>	310,000	
Diatomite	1,879	9,500	8,028	1,450 <sup>r</sup>	1,500	
Feldspar	191,316	242,898	252,713	286,033 <sup>r, 4</sup>	290,000	
Fluorspar	32,006	47,730	54,052	64,601 <sup>r, 4</sup>	65,000	
Gemstones, turquoise <sup>c</sup>	kilograms	20,000	20,000	20,000	20,000	
Gypsum	thousand metric tons	13,535	13,828	12,594	11,196 <sup>r, 4</sup>	12,000
Industrial or glass sand (quartzite and silica)	1,878,867	1,964,965	1,880,093	1,900,000	1,900,000	
Lime	thousand metric tons	2,200	2,300	2,500	2,500	2,600
Magnesite	128,565	87,795	88,194	114,708 <sup>r, 4</sup>	110,000	
Mica	2,845	5,500	7,032	705 <sup>r</sup>	--	
Nepheline syenite	75,000	75,500	63,798	65,000	70,000	
Nitrogen:						
N content of ammonia	1,119,100	1,115,100	1,087,700	1,020,000	1,020,000	
N content of urea	732,700	734,200	717,800	670,000	670,000	
Perlite	20,000	26,495	31,259	31,000	40,000	
Phosphate rock:						
Ore	303,000	194,000	229,575	324,166 <sup>r, 4</sup>	325,000	
P <sub>2</sub> O <sub>5</sub> content <sup>c</sup>	36,000	23,000	28,000	40,000 <sup>r</sup>	40,000	
Pigments, mineral, natural iron oxide, ochre <sup>c</sup>	2,300 <sup>4</sup>	2,300	2,500	2,500	2,600	
Pumice and related volcanic materials <sup>c</sup>	1,181,543 <sup>4</sup>	1,228,388 <sup>4</sup>	1,536,448 <sup>4</sup>	1,500,000	1,400,000	
Salt	1,664,496	2,002,899	1,790,669	2,009,195 <sup>r, 4</sup>	2,000,000	
Soda ash <sup>c</sup>	120,000	120,000	130,000	130,000	130,000	
Sodium compound, caustic soda <sup>c</sup>	22,000	22,000	22,000	22,000	20,000	
Stone:						
Construction and building, crushed <sup>6</sup>	thousand metric tons	19,809	21,383	25,369	25,000	25,000
Dimension and decorative:						
Granite	do.	620	838	1,019	1,000	1,000
Marble, blocks and slabs <sup>7</sup>	do.	3,462	4,014	4,068	4,000	4,000
Travertine, blocks	do.	728	935	1,360	1,400	1,400
Total	do.	4,810	5,790	6,450	6,400	6,400
Dolomite	do.	439	522	609	600	600
Limestone <sup>c</sup>	do.	41,100	46,170 <sup>4</sup>	50,380 <sup>4</sup>	50,000	50,000
Strontium, celestite <sup>c</sup>	2,000	2,100 <sup>4</sup>	7,500 <sup>4</sup>	672 <sup>r</sup>	--	
Sulfates, natural: <sup>c</sup>						
Aluminum potassium sulfate (alum)	10,000	1,000	1,000	1,000	1,000	
Sodium sulfate	580,000	580,000	600,000	600,000	600,000	
Sulfur: <sup>c</sup>						
Byproduct of petroleum and natural gas	1,200,000 <sup>4</sup>	1,310,000	1,400,000	1,400,000	1,400,000	
Byproduct of metallurgical processing, S content of acid	50,000	50,000	60,000	60,000	60,000	
Total	1,250,000	1,360,000	1,460,000	1,460,000	1,460,000	
Talc	68,007	65,833	187,465	70,600 <sup>r</sup>	70,000	
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal	thousand metric tons	2,076	1,902	2,498	1,898 <sup>r, 4</sup>	2,000
Coke	do.	1,055	1,004	1,021	1,020	1,000

See footnotes at end of table.

TABLE 1--Continued  
 IRAN: PRODUCTION OF MINERAL COMMODITIES<sup>1, 2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>		2002	2003	2004	2005 <sup>c</sup>	2006 <sup>c</sup>
MINERAL FUELS AND RELATED MATERIALS--Continued						
Gas, natural: <sup>e</sup>						
Gross	million cubic meters	120,000	125,000	137,000	150,000	160,000
Dry	do.	75,000	81,500	89,663 <sup>4</sup>	100,000 <sup>f</sup>	105,000
Plant liquids	thousand 42-gallon barrels	25,000	25,000	84,000 <sup>f</sup>	85,000 <sup>f</sup>	90,000
Petroleum:						
Crude	do.	1,250,000	1,470,000 <sup>f</sup>	1,500,000 <sup>f</sup>	1,500,000 <sup>f</sup>	1,530,000
Refinery products: <sup>e</sup>						
Liquefied petroleum gases	do.	16,000	16,000	48,100 <sup>f</sup>	50,000 <sup>f</sup>	50,000
Motor gasoline	do.	67,000	67,000	92,000 <sup>f</sup>	92,000 <sup>f</sup>	92,000
Jet fuel	do.	14,000	14,000	6,300 <sup>f</sup>	6,000 <sup>f</sup>	6,000
Kerosene	do.	46,000	46,000	52,800 <sup>f</sup>	53,000 <sup>f</sup>	53,000
Distillate fuel oil	do.	135,000	140,000	117,000 <sup>f</sup>	120,000 <sup>f</sup>	120,000
Residual fuel oil	do.	152,000	160,000	172,000 <sup>f</sup>	170,000 <sup>f</sup>	170,000
Other	do.	95,000	100,000	21,000 <sup>f</sup>	20,000 <sup>f</sup>	20,000
Total	do.	525,000	543,000	509,200 <sup>f</sup>	511,000 <sup>f</sup>	511,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>f</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through November 16, 2007.

<sup>2</sup>Data are for Iranian years ending March 20 of that stated, except data for alumina, natural gas, natural-gas-plant liquids, and petroleum, which are for Gregorian calendar years.

<sup>3</sup>In addition to commodities listed, the following may have been produced, but information is inadequate to estimate output: antimony, bromine, ferromolybdenum, hafnium oxide, ilmenite, selenium, shell, silicomanganese, uranium, zeolite, and zirconium metal.

<sup>4</sup>Reported figure.

<sup>5</sup>Includes gold recovered from the Mouteh gold mine and from the Sarcheshmeh copper complex.

<sup>6</sup>Includes marble and travertine.

<sup>7</sup>Includes marmarite.

TABLE 2  
IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2006<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Iran Alumina Co. (Government)	About 15 kilometers northeast of Jajarm	280
Aluminum	Iran Aluminium Co. (Iranian Mines and Mining Development and Renovation Organization) <sup>3</sup>	Arak	120
Do.	Almahdi Aluminium Corp. (Iranian Mines and Mining Industries Development and Renovation Organization, <sup>3</sup> 59.34%, and International Development Corp., 20.78%)	Bandar Abbas	110
Cement	Abadeh Cement Co.	Abadeh	175
Do.	Abyek Cement Co. (Fars & Khouzestan Cement Co.)	Abyek, 80 kilometers northwest of Tehran	2,600
Do.	Ardebil Cement Co. (Ehdasse Sanat Corp. <sup>4</sup> and Holcim Ltd.)	About 20 kilometers from Astara	800
Do.	Behbahan Cement Co. (Fars & Khouzestan Cement Co.)	Behbahan	960
Do.	Benvid White Cement Co.	Benvid, Isfahan	175
Do.	Bojnourd Cement Plant (Fars & Khouzestan Cement Co.)	About 37 kilometers from Bojnourd	700
Do.	Bushehr Cement Co. (Dashtestan Cement) (Ehdasse Sanat Corp.) <sup>4</sup>	Borazjan	1,100
Do.	Darab Cement Co. (Ehdasse Sanat Corp.) <sup>4</sup>	Near Shiraz	1,100
Do.	Doroud Cement Co. (Fars & Khouzestan Cement Co.)	Doroud	1,400
Do.	Ekbatan Cement Co.	Ekbatan	175
Do.	Estahban Cement Co.	Estahban	350
Do.	Faraz Firouzkhuh Cement Co. (Fars & Khouzestan Cement Co., 55%, and The Cement Tamin Co., <sup>5</sup> 45%)		1,200
Do.	Fars Cement Co. (Fars & Khouzestan Cement Co.)	Fars	2,000
Do.	Fars Nov Cement Co. (Fars & Khouzestan Cement Co.)	do.	1,000
Do.	Ghaen Cement Co. (Fars & Khouzestan Cement Co.)	Ghaen	770
Do.	Gharb Cement Co. (Fars & Khouzestan Cement Co.)	Kermanshah	700
Do.	Gorgon Cement Co.	NA	640 <sup>e</sup>
Do.	Hegmatan Cement Co. (Tehran Cement Co.)	East of Razan	1,120
Do.	Hormozgan Cement Co. (Sepahan Cement Co.)	About 52 kilometers west of Bandar Abbas	2,200
Do.	Ilam Cement Co. (Tehran Cement Co.)	Ilam	700
Do.	Isfahan Cement Co.	Esfahan	1,100
Do.	Karoon Cement Co.	Karoon	1,050
Do.	Kavir Kashan	Near Kashan	660
Do.	Kerman Cement Co. (Bank Melli Iran Investment Co.)	Kerman	1,260
Do.	Khash Cement Co. (Fars & Khouzestan Cement Co.)	Khash	730 <sup>e</sup>
Do.	Khazar Cement Co. (Fars & Khouzestan Cement Co.)	Khazar	640 <sup>e</sup>
Do.	Khouzestan Cement Co. (Fars & Khouzestan Cement Co.)	Ramhormoz	1,100 <sup>e</sup>
Do.	Kohkiloye Yasuj Cement (State Retirement Organization) <sup>3</sup>	Kohkiloye	240
Do.	Kordestan Cement Co. (Sepahan Cement Co.)	North of Bijar	800 <sup>e</sup>
Do.	Mazandaran Cement Co. (Bank Melli Iran Investment Co.)	Neka	700
Do.	Mashad Cement Co.	Mashad	1,000 <sup>e</sup>
Do.	Qeshm Cement Co.	Qeshm Island	250
Do.	Oroumiyeh Cement Co.	Uroumiyeh (Urumia)	740
Do.	Oroumiyeh White Cement Co.	do.	180 <sup>e</sup>
Do.	Neyriz White Cement Co. (Fars & Khouzestan Cement Co.)	Neyriz	160
Do.	Saveh White Cement Co. (State Retirement Organization) <sup>3</sup>	Saveh Grey Cement Factory, Saveh	2,400
Do.	do.	Saveh White Cement Factory, Saveh	350
Do.	Sepahan Cement Co.	Sepahan	2,300
Do.	Sharoud Cement Co. (Sepahan Cement Co.)	Sharoud	600
Do.	Sharg Cement Co. (Sepahan Cement Co.)	Mashhad	1,600
Do.	Shomal Cement Co. (Bank Melli Iran Investment Co.)	Shomal	880
Do.	Simansaz (Loshan) Cement Co. (Tehran Cement Co.)	Loshan	200 <sup>e</sup>
Do.	Soufian Cement Co. (Tehran Cement Co.)	Sufiyan	1,500
Do.	Tehran Cement Co.	Tehran	6,000
Do.	Yazd Bohrouk Cement Co.	Yazd	1,260

See footnotes at end of table.



TABLE 2--Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2006<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Chromite	Faryab Mining Co.	Faryab Mine and processing plant, Minab, Hormuzgan	180 <sup>e</sup>
Do.	Esfandaghe Mines Co.	Abdasht Mine, Kerman and Suqan (Saboughan) Mine Kerman; Processing plant at Esfandaghe, Kerman	30
Do.	NA	Furumad Mine, Shahrud, Semnan; Gaft processing plant, Semnan	6
Do.	NA	Mir Mahmud Mine, Mayami, Seman	6
Do.	NA	Dumak Mine, Zahedan, Sistan va Baluchestan	2
Do.	Other companies	Other mines	30 <sup>e</sup>
Coal	Kerman Coal Co. (Iranian Mineral Production & Supply Co., 100%) <sup>4</sup>	Includes the Ashkli, the Babnizo, the Badamouiyeh, the Eshkeli, the Hamkar, the Hojedk, the Kamsar, the Khoshooni (Hashouni), and the Pabdana Mines	1,300
Do.	Iranian Mineral Production & Supply Co. <sup>4</sup>	Parvadeh 3 and 4 Mines, Tabass, Khorasan	750 <sup>6</sup>
Do.	Zirab Coal Co. (Iranian Mineral Production & Supply Co., 100%) <sup>4</sup>	Gajereh, Goliran, and Zirab Mines, Mazandaran	600
Do.	Shahroud Coal Co. (Iranian Mineral Production & Supply Co., 100%) <sup>4</sup>	Shahroud Mine, Mazandaran; Razi and Tazareh Mines, Semnan	280
Do.	Western Alborz Coal Co. (Iranian Mineral Production & Supply Co., 100%) <sup>4</sup>	Abyek Mine, Qazvin; Sangroud Mine, Gilan	150
Do.	Fajr Mazinoy Cooperative Co.	East Mazinoy and West Mazinoy, Khorasan	8
<b>Copper:</b>			
Concentrate	National Iranian Copper Industries Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Sar Cheshmeh Mine, 60 kilometers south of Rafsanjan, Kerman	179
Do.	do.	Songun copper mine, Azarbajjan	45 <sup>6</sup>
Do.	do.	Meiduk copper mine, Kerman	34
Do.	do.	Qal'eh Zari Mine, near Birjand, Khorsan	10
Do.	Private cooperatives	Chah Musa Mine and Qal'eh Sukhteh, Semnan	5
Smelter output	National Iranian Copper Industries Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Smelter, Sar Cheshmeh copper complex	197
Do.	do.	Smelter, Khatounabad	96
Refined metal	do.	Refinery, Sar Cheshmeh copper complex	200
Do.	do.	Electrowon plant, Sar Cheshmeh copper complex	14
<b>Ferroalloys:</b>			
Ferrochromium	Kerman Ferrochrome Co.	Kerman	25
Do.	Iranian Mineral Production & Supply Co. <sup>4</sup>	Sabzevar, Khorasan	25
Do.	Faryab Mining Co.	Faryab, Kerman	15
Do.	Navid Alloy Co.	NA	2
Ferromanganese	Faryab Mining Co.	Faryab, Kerman	15 <sup>e</sup>
Ferromolybdenum	Pars Molybden Co.	Yazd, Yazd	1
Do.	National Iranian Copper Industries Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Khatounabad smelter	1.5 <sup>e</sup>
Do.	Zanjan Bronze Co.	NA	0.5 <sup>e</sup>
Ferrosilicon	Iran Ferroalloy Industries Co. (Bank of Industry and Mines, 100%) <sup>3</sup>	Azna, Lorestan	25
Do.	Iran Ferrosilice Co.	Semnan	25
Fluorspar	Private cooperative	Kamar Mehdi Mine, 165 kilometers southwest of Tabas	20 <sup>e</sup>
Do.	NA	Delijan Region Mines, 10 kilometers from Delijan, Markazi	6 <sup>e</sup>
Do.	NA	Kamarposht Mine, 20 kilometers from Zirab	5 <sup>e</sup>
Do.	NA	Emaft Mine, 30 kilometers from Zirab, Mazandaran	3 <sup>e</sup>

See footnotes at end of table.

TABLE 2--Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2006<sup>1, 2</sup>

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Fluorspar--Continued		NA	Helali Gonabad Mine, 27 kilometers from Gonabad-Bajestan road	2 <sup>e</sup>
Do.		NA	Mahalat Mine, 5 kilometers from Mahalat, Markazi	2 <sup>e</sup>
Do.		NA	Pachi Miyana Mine, 30 kilometers from Zirab	2 <sup>e</sup>
Do.		NA	Jouimand Mine, 23 kilometers northwest of Gonabad, Khorasan	NA
Do.		NA	Derasele deposit	NA
Gemstones, turquoise		NA	Neyshabour Mine	6 <sup>e</sup>
Gold:				
Ore	kilograms	Iran Gold Co.	Muteh Mine (Chah Khaton and Senjedeh pits), Esfahan, and Kuh-e-Zar Mine, Semnan	600
Do.	do.	Artisanal placer operations	Neyshabour area	NA
Metal <sup>7</sup>	do.	National Iranian Copper Industries Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Sarcheshmeh Copper Complex, Kerman	500
Iron:				
Ore		Iran Central Iron Ore Co. (National Iranian Steel Co., 100%) <sup>4</sup>	Choghart Mine, Bafgh, Yazd	7,400
Do.		Chadormalou Mining and Industrial Co. (National Iranian Steel Co., 100%) <sup>4</sup>	Chadormalou Mine, 90 kilometers north of Tchogart	6,500
Do.		Gol-e-Gohar Iron Ore Co. (National Iranian Steel Co., 100%) <sup>4</sup>	Gol-e-Ghar Mine, Kerman	3,800
Do.		Sangan Iron Ore Co. (National Iranian Steel Co., 100%) <sup>4</sup>	Sangan (Songun) Mine, Golestan	300
Do.		About 50 small privately owned mines	NA	1,000 <sup>e</sup>
Metal		Mobarekeh Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Direct-reduction iron plant (Midrex process) at Esfahan	4,000
Do.		Khouzestan Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Direct-reduction iron plant (HYL I, Midrex, and Purofer processes), Ahwaz	3,200
Do.		Isfahan Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Direct-reduction iron plant (Ghaem process) at Esfahan	600
Manganese		Iran Manganese Mines Co. (Takado Co.)	Venarch Manganese Mine, Qom	70
Do.		Qom Manganese Mines Co.	Shahrestouak Mine, Qom	3
Molybdenum		National Iranian Copper Industries Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Sarcheshmeh Copper Complex, Kerman	NA
Natural gas	billion cubic meters	National Iranian Oil Co. (Government, 100%)	Associated gas from company oilfields	96
Do.	do.	do.	Aghar, Dalan, Kangan, and Nar gasfields	57
Do.	do.	Pars Oil and Gas Co. (National Iranian Oil Co., 100%) <sup>3</sup>	South Pars gasfields	32 <sup>8</sup>
Petroleum:				
Crude	million 42-gallon barrels	National Iranian Oil Co. (Government, 100%)	Onshore oilfields include the Agha Jari, the Ahwaz-Asmari, the Bangestan, the Hakimeh, the Gachsaran, the Karanj, the Marun, the Pazanan, and the Rag-e-Safid. Offshore oilfields include the Abouzar, and the Salman	1,400
Do.	do.	National Iranian Oil Co. and buyback contract joint venture of Shell Iran Nowrooz/Soroosh Development (70%), JJI S&N B.V. (20%), and Iranian Offshore Engineering & Construction Co. (10%)	Nowrooz and Soroosh Fields, offshore	75
Do.	do.	National Iranian Oil Co. and buyback contract joint venture of Total S.A. (55%) and Eni SpA (45%)	Doroud Field, offshore,	65
Do.	do.	National Iranian Oil Co. and buyback contract joint venture of Total S.A. (70%) and PETRONAS Carigali International Sdn Bhd (30%)	Sirri A and E Fields, offshore	40
Do.	do.	National Iranian Oil Co. and buyback contract joint venture of Total S.A. (60%) and Naftiran Intertrade Co. (40%)	Darquain Field, onshore	17

See footnotes at end of table.

TABLE 2--Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2006<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Petroleum--Continued.				
Refined products	thousand 42-gallon barrels per day	National Oil Refining and Distribution Co. (Government, 100%)	Refineries at Abadan, Arak, Bandar Abbas, Esfahan, Kermanshah, Lavan, Shiraz, Tabriz, and Tehran	1,728
Phosphate rock	Phosphate Mines Development Co. (Iranian Mines and Mining Industries Development and Renovation Organization, 100%) <sup>3</sup>	Esfordi Mine, Yazd		360
Do.	Chadormalou Mining and Industrial Co. (National Iranian Steel Co., 100%) <sup>4</sup>	Chador Malu Mine		NA
Do.	Other companies	Other mines		29
Steel, crude	Mobarekeh Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Plant at Esfahan		4,200
Do.	Isfahan Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	do.		2,900
Do.	Khouzestan Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Plant at Ahwaz		2,600
Do.	National Iranian Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Includes subsidiaries Iran National Steel Industrial Group plant at Ahwaz, and Khorasan Steel Co. plant near Neyshabur		1,500
Titanium, ilmenite	Kahnuj pilot plant (Iranian Mines and Mining Industries Development and Renovation Organization) <sup>3</sup>	Daregaz placer and Kahnuj titanium dioxide processing plant		NA
Uranium	Atomic Energy Organization of Iran (Government)	Saghand Mine, about 100 kilometers northeast of Yazd		NA
Zinc:				
Ore	Angouran Mining Company (Iran Zinc Mine Development Co.)	Angouran Mine, Zanjan		500 <sup>9</sup>
Do.	BAMA Co.	Irankouh complex (Goosh-e-feel, Gowd-e-Zendan, Khaneh Gorgi, Kolah Darwazeh, and Tappeh Sorkhi Mines), Esfahan		190 <sup>9</sup>
Do.	Bafgh Mining Co.	Kushk Mine, Yazd		120 <sup>9</sup>
Refined metal	Bafgh Zinc Co. (Iran Zinc Mine Development Co.)	Bafgh, Yazd		30
Do.	Qeshm Zinc Smelter Co. (affiliate of Calcimin Co.)	Qeshm Island, Hormozgan		20
Do.	National Iranian Lead and Zinc Co. (Iran Zinc Mine Development Co.)	Zanjan		15
Do.	Calcimin Co. (Iran Zinc Mine Development Co.)	Dandi (Angouran) plant, Zanjan		14
Do.	Faravari Mavad Madani Iran Co. (Iran Zinc Mine Development Co.)	Zanjan		14
Do.	Bandar Abbas Zinc Production Co. (affiliate of Calcimin Co.)	Bandar Abbas		13
Do.	Zanjan Zinc Smelter Co. (affiliate of Calcimin Co.)	Zanjan		5

<sup>6</sup>Estimated. NA Not available.

<sup>1</sup>About 2,700 mines are located in Iran, about 2,000 of which are active. About 65% of the active mines and quarries produce building and construction materials, such as aggregate, sand, and stone.

<sup>2</sup>Data was augmented by input from the Iranian National Committee of the World Mining Congress.

<sup>3</sup>Government owned.

<sup>4</sup>A subsidiary of state-owned Iranian Mines and Mining Industries Development and Renovation Organization.

<sup>5</sup>Associated with the Iranian Social Security Organisation.

<sup>6</sup>Under construction.

<sup>7</sup>Recovered from Sar Chemesheh copper plant slimes.

<sup>8</sup>May include basic sediment and condensate.

<sup>9</sup>Includes lead and zinc ores