

THE MINERAL INDUSTRY OF IRAN

By Philip M. Mobbs

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. In 2004, Iranian crude oil production averaged about 3.8 million barrels per day, and according to the U.S. Energy Information Administration (2005), Iran was the world's fourth leading producer of crude oil after Saudi Arabia, Russia, and the United States. The Central Bank of the Islamic Republic of Iran (2005, p. 34) reported that the average spot price of Iranian crude oil was \$33.38 per barrel in 2004.

The International Monetary Fund (2005§¹) reported that the real gross domestic product (GDP) increased by about 5.6% in 2004. The GDP based on purchasing power parity was estimated to be about \$519 billion in 2004, and the GDP per capita based on purchasing power parity was about \$7,600. The population of the 1.648-million-square-kilometer country was estimated to be about 69 million.

Structure of the Mineral Industry

The Ministry of Industries and Mines' authority covered all mining, smelting, and refining industries except the oil and gas sectors, which were administered by the Ministry of Petroleum. The Geological Survey of Iran performed initial geologic and mineral exploration and evaluation of the mineral resources (except hydrocarbons). Most of the country's active mines were privately owned, although the Government retained operational control of many of the larger mineral commodity companies, especially those that produced aluminum, ammonia, cement, coal, copper, iron and steel, natural gas and oil, salt, and sulfur.

Commodity Review

Metals

Chromium and Ferroalloys.—In 2004, chromite production rebounded when a number of inactive chromite mines resumed production; 38 mines were operational in 2004 compared with 20 in 2003. A 25,000-metric-ton-per-year (t/yr)-capacity high-carbon ferrochrome plant was under construction at Sabzevar in northeastern Iran for the Iran Minerals Producer & Supply Co. (a subsidiary of the state-owned Iranian Mines and Mining Industries Development and Renovation Organization). The new ferrochrome plant, which was scheduled to begin production in early 2005, was expected to consume about 78,000 t/yr of domestically produced chromite (Ministry of Industries & Mines, 2005§).

Ferrosilicon production also rebounded in 2004. Iran Ferrosilice Co. had suspended production in July 2003 while its 25,000-t/yr-capacity furnace in Semnan Province was

overhauled. Production resumed in October 2003. Iran Ferroalloy Industries Co. proposed to increase the capacity of its ferrosilicon operations at Azna, Lorestan Province, to 45,000 t/yr from 25,000 t/yr (Iran Ferroalloy Industries Co., 2005§).

Copper and Molybdenum.—In December 2004, the state-owned National Iranian Copper Industries Co. (Nicico) officially opened the Meiduk copper mine. The mine was expected to produce 5 million metric tons per year (Mt/yr) of ore with a grade of 1% copper from which the Meiduk concentrator facilities were designed to produce 150,000 t/yr of copper concentrate with an average grade of 30% copper. Nicico's \$245 million Khatounabad copper smelter also was commissioned in 2004. The 80,000-t/yr-capacity flash smelter was built by China Nonferrous Metal Industry's Foreign Engineering and Construction Co., Ltd. Copper anode output from the Khatounabad facility was to be refined at Nicico's Sarcheshmeh copper complex (Mining Journal, London, 2003).

Nicico continued to expand the capacity of the Sarcheshmeh copper mine to 21 Mt/yr of sulfide ore from 14 Mt/yr; concentrate production capacity was increased to about 540,000 t/yr of copper concentrate at an expected average grade of 28% copper from 372,000 t/yr at a grade of 30% to 32% copper, and molybdenum concentrate capacity was increased to 1,600 t/yr at a grade of 54% molybdenum. Expansion of the Sarcheshmeh copper refinery to 260,000 t/yr of copper cathode from a nominal design capacity of 150,000 t/yr also was underway. Nicico planned to evaluate further expansion of the Sarcheshmeh complex in 2005. The proposed Phase 2 expansion would increase mine output to 28 Mt/yr, copper concentrate production to 702,000 t/yr with a grade of 28% copper, and molybdenum concentrate to 6,000 t/yr with a grade of 54% molybdenum (Middle East Economic Digest, 2004f; National Iranian Copper Industries Co., undated a§, b§).

Development of the Songun copper mine and concentrator also continued. In 2005, Nicico expected to begin to mine about 7 Mt/yr ore with a grade of 0.67% copper at Songun and to produce 170,000 t/yr of concentrate with a grade of 30% copper (Middle East Economic Digest, 2004f).

The primary Sarcheshmeh facilities were designed to process sulfide ore. About 27 million metric tons (Mt) of oxide ore with an estimated grade of 0.61% copper had been stripped and stockpiled. The oxide stockpile was processed by a 12,000-t/yr-capacity solvent extraction-electrowinning (SX-EW) plant. Low-grade (about 0.6% copper) sulfide ores also were present at Sarcheshmeh. In 2004, the Council for Mineral Technology (Mintek) of South Africa and Nicico agreed to process about 60,000 metric tons (t) of the low-grade sulfide ore in a heap bioleach project; the resultant copper-bearing solution would be processed by a new SX-EW plant (Council for Mineral Technology, 2004§).

Copper World J.S.P. Co. of Tehran produced electrolytic-tough-pitch and fire-refined-high-conductivity copper rod

¹References that include a section mark (§) are found in the Internet References Cited section.

from copper scrap at its 36,000-t/yr-capacity plant. In 2004, the Outokumpu Group began construction of a 16,000-t/yr-continuous-casting system for Copper World (Outokumpu Group, 2004§).

Gold.—Much of the gold recovered in Iran was a byproduct of Nicico's Sarcheshmeh copper complex operations. Gold content of the copper ore was about 0.46 gram per metric ton (g/t). Additional gold ore was mined from the Mouteh Mine, the grade of which ranged from 2.5 to 4 g/t, and recovered from placer mines in the Neyshabour area (Iranian Mines and Mining Industries Development and Renovation Organization, 2005, p. 131).

Several gold exploration projects were underway; these included several prospects of Iran Mining Production & Supply Co., Persian Gold Plc. of the United Kingdom's exploration in the Takestan area, the evaluation of the Agh Darreh gold prospect in northwestern Iran by the Pouya Zarcan Agh Darreh Co. joint venture, Rio Tinto plc's work on the Sari Gunay project in Kordestan Province, and Zarmehr Gold Co. of Iran's work in Khorasan Province. The Geological Survey of Iran also evaluated several gold exploration prospects in 2004.

Iron and Steel.—The Government controlled much of the Iranian steel sector. At yearend 2003, six steel mills were privately owned. Another 11 small private steel mills, which were designed to produce a total of about 1.7 Mt/yr, were commissioned in 2004. A 1.6-Mt/yr hot-strip rolling mill was under construction in Rasht, Gilan Province, for Semnan Rolling & Tube Mills Co. The mill was expected to be operational in early 2005. The Government proposed to divest 50% of its interest in Isfahan Steel Mills, Khuzestan Steel Co., and Mobarekeh Steel Co. All three companies were subsidiaries of National Iranian Steel Co. (Metal Bulletin, 2004; Iran Daily, 2004i§; Tehran Times, 2005§).

Zinc.—In December, Mehdiabad Zinc Co. began a bankable feasibility study of the Mehdiabad zinc project. The owners proposed to produce zinc metal from a 160,000-t/yr-capacity zinc plant, which would process the deposit's oxide ore, and a 340,000-t/yr-capacity zinc plant, which would process sulfide ore (Union Resources Ltd. 2004).

Mineral Fuels

Natural Gas.—The Government proposed to increase Iranian natural gas production capacity to 300 billion cubic meters per year by 2014 from about 140 billion cubic meters per year in 2004. Most of the new production was to come from the offshore South Pars Field, which was the Iranian portion of Qatar's offshore North Field. A significant volume of natural gas produced onshore was reinjected into onshore oil reservoirs for pressure maintenance and to enhance recovery operations. Construction of infrastructure to capture the associated gas produced from offshore oilfields continued. Flaring of natural gas associated with offshore oil production in the Kharg and the Sirri regions was expected to end by 2008 (Iran Daily, 2004g§, h§).

The 25-million-cubic-meter-per-day Phase 1 gas plant of the multi-phase South Pars development project was inaugurated at Bandar Assaluyeh in 2004. Initial natural gas production from

two offshore platforms, which were part of Phases 4 and 5 of the South Pars project, began in 2004. Completion of Phases 4 and 5 of the South Pars project, which included another gas plant at Bandar Assaluyeh, was expected in 2005. The annual output of the South Pars Phase 4 and 5 gas plant was expected to include about 1.05 Mt of liquefied petroleum gas, 145,000 t of sulfur, and 80,000 barrels of natural gas liquids (Iran Daily, 2004c§, f§; Rigzone.com, 2004§).

In 2004, Turkey again requested that the price of natural gas, which it imported from Iran under a long-term contract, be renegotiated. Iran concluded natural gas export negotiations with Armenia, which contracted to purchase 36 billion cubic meters of gas over a 20-year term. The construction of a 140-kilometer gas pipeline, which would link Armenia and Iran, began in November. The 1.1-billion-cubic-meter-per-year-capacity pipeline was expected to be completed in 2007. An expansion of the line to 2.3 billion cubic meters per year was proposed to be completed in 2019 (Dow Jones Newswires, 2004§).

Iran continued negotiations on natural gas exports to India, Kuwait, Pakistan, and the United Arab Emirates. Negotiations with Russia, Turkey, and Ukraine that covered the export of natural gas to Europe were proposed. In addition to the natural gas pipelines, several other natural gas export projects were under study; these included gas-to-liquids and liquefied natural gas (LNG) plants.

Economic evaluation of the 10-Mt/yr-capacity Pars LNG project, which was a venture of National Iranian Gas Export Co. [a subsidiary of state-owned National Iranian Oil Co. (NIOC)], Petroliaam Nasional Bhd. (Petronas) of Malaysia, and Total S.A. of France, was expected to begin in 2005. The 10-Mt/yr-capacity Persian LNG project, which was a venture of NIOC, Repsol YPF S.A. of Spain, and the Royal Dutch/Shell Group, also was under study. In 2004, China agreed to purchase LNG from the proposed two-train 5-Mt/yr-capacity NIOC LNG project. Plans for the NIOC LNG projected that the initial LNG train would be operational in 2008 and the second, by 2013 (Middle East Economic Digest, 2004b, c).

Iran also imported about 10 million cubic meters per day of natural gas from Turkmenistan for use in northeastern Iran (Iran Daily, 2004b§).

Petroleum.—In response to higher international petroleum demand, Iranian production again increased, to about 1.4 billion barrels per year in 2004. The Government expected that the annual national oil production capacity would be increased to about 1.6 billion barrels by early 2005. Foreign direct investment in the oil sector for the fourth development plan (2005 to 2010) was expected to be about \$31 billion. The Government also proposed to start up an oil trading facility, which would compete with the International Petroleum Exchange in London and the New York Mercantile Exchange, Inc (NYMEX) in New York. The Tehran oil exchange, which was expected to trade delivery and futures contracts for crude oil, petrochemicals, and refined petroleum products, was expected to be operational in 2006 (Middle East Economic Digest, 2004e; Iran Daily, 2004a§; Iranmania, 2004§).

As part of the Caspian Republics Oil Swap (CROS) program, which was inaugurated in April 2004, crude oil from

Kazakhstan and Turkmenistan was shipped to Neka, Iran, and transported to the Tabriz and the Tehran oil refineries via the 170,000-barrel-per-day (bbl/d)-capacity Neka-Rey oil pipeline. An equivalent amount of Iranian oil was then shipped from oil ports in southern Iran for the Kazak and Turkmen companies. By late 2004, the CROS program suffered a temporary setback caused by widening pricing differences between the lighter Caspian crudes and the heavier Iran exports, when light Caspian oil was shipped to Europe, bypassing Iran (Agence France Presse, 2004§; Platts, 2004§).

In late 2004, the National Iranian Oil Refining & Distribution Co. (NIORDC) cancelled the proposed \$500 million upgrade of the Tabriz and the Tehran oil refineries that was associated with the CROS program. The state-owned National Oil Engineering and Construction Co. considered building an additional crude oil refinery in northern Iran or reconfiguring existing refineries in Arak and Isfahan to refine surplus crude oil received under the CROS program. Iran's nine state-owned oil refineries were unable to meet domestic demand for motor vehicle fuels, which resulted in the country's importation of about 48 million barrels of gasoline in 2004. To address the increasing domestic fuel demand, which continued to outpace Government projections, and to meet European fuel quality standards, NIORDC proposed to build new refineries, to expand the production capacity of the Arak refinery to 250,000 bbl/d from 150,000 bbl/d, and to rehabilitate the Abadan, the Bandar Abbas, the Isfahan, and the Lavan Island refineries. In the past 5 years, the private sector has obtained permits to build 17 oil refineries; none of these refineries, however, has proved to be economical to construct (Middle East Economic Digest, 2004a, d, g, h; 2005; Iran Daily, 2004d§, e§).

The \$70 million renovation at Bandar Abbas included expansion of the production capacity of both of the facilities' two crude distillation units to 160,000 bbl/d from 116,000 bbl/d and the installation of a new liquefied petroleum gas (LPG) recovery unit. NIORDC also began to evaluate the feasibility of expanding the Bandar Abbas refinery to 640,000 bbl/d. The proposed replacement of a fluid catalytic converter at the Isfahan refinery was expected to cost \$1.5 billion, and the \$40 million renovation of the Lavan Island refinery would include the installation of a new LPG unit (Middle East Economic Digest, 2004a, d, h).

In February, the Iraqi Oil Ministry reported that it was evaluating an Iranian proposal to build a 10-kilometer 250,000- to 350,000-bbl/d-capacity oil pipeline between Abadan, Iran, and Basra, Iraq (Hafidh, 2004§).

Additional coverage of the natural gas and petroleum industry of Iran is available from the U.S. Energy Information Administration (2005§).

Outlook

The Government's continued development of the nuclear reactor at Bushehr adversely affected the country's international relations. The stated objective of providing low-cost nuclear-powered electrical energy to the domestic Iranian market, which would allow natural gas and oil to be exported for income instead of burned for fuel in Iran, was overshadowed

by international concern about the potential for the development of nuclear weapons in Iran.

More than 60% of Iranian oil production was exported in 2004. Oil production was expected to increase to supply domestic and international demand. The Government profited from the windfall as international oil prices remained at higher-than-expected levels. The state-owned oil companies were expected to continue to increase offshore and onshore petroleum exploration efforts, which would be supplemented in the future by funding and work by international firms. The development of identified natural gas and oil resources was expected to continue, subject to limitations imposed by the economic sanctions of the United States, which prohibited companies and persons from the United States from performing services or supplying goods or technology that would benefit the Iranian oil industry. With only 18 of the proposed 28 segments of the South Pars natural gas development project started, the project was expected to continue for a number of years. New construction and renovation of existing oil refineries was expected to begin during the next 5-year plan (2005 to 2010).

Unlike many oil-dominated economies, Iran had diversified its oil-based economy. Numerous development or expansion projects were underway in the metals sector, especially in the aluminum, copper, ferroalloys, gold, iron and steel, and zinc industries. In the industrial minerals sector, development or expansion projects in the cement, magnesium, potash, and stone industries also were expected to be completed in the next 5 years.

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Major Sources of Information

Geological Survey of Iran
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TABLE 1
IRAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2000	2001	2002	2003	2004 ^P
METALS					
Aluminum:					
Bauxite, gross weight	485,130 ^r	273,677 ^r	57,254 ^r	365,837 ^r	419,955
Alumina	--	--	101,339 ^r	102,785 ^r	137,002
Metal, primary ingot	140,000 ^c	146,000 ^r	168,715	182,477 ^r	212,602
Arsenic, orpiment and realgar, concentrates ^c	400	400	400	275 ^r	89 ⁴
Chromite, mine output, concentrate					
Gross weight	161,138 ^r	145,170 ^r	512,640	97,328 ^r	138,755
Cr ₂ O ₃ content ^c	79,000 ^r	69,000 ^r	250,000	48,000 ^r	68,000
Copper:					
Mine output:					
Ore mined (0.6% to 1.2% Cu):					
Gross weight	14,413 ^r	16,140 ^r	15,529 ^r	15,084 ^r	18,885
Cu content ^c	150,000 ^r	170,000 ^r	160,000 ^r	160,000 ^r	190,000
Concentrate (29% to 35% Cu):					
Gross weight	381,841 ^r	414,133 ^r	394,061 ^r	395,036 ^r	448,689
Cu content ^c	125,000	121,000	121,000	130,000	150,000
Metal:					
Smelter output, blister/anode	181,238 ^r	181,526 ^r	171,591 ^r	168,613 ^r	184,814
Refined output, cathode	155,856 ^r	152,703 ^r	143,438 ^r	145,669 ^r	152,463
Gold, mine output, Au content ⁵	216 ^r	192 ^r	210 ^r	203 ^r	195
Iron and steel:					
Ore and concentrate:					
Gross weight	12,370	13,978 ^r	16,906 ^r	18,287 ^r	18,205
Fe content ^c	5,800 ^r	6,400 ^r	8,000 ^r	9,000 ^r	8,900
Metal:					
Pig iron ^c	2,200	2,300	2,400	2,709 ^{r,4}	2,136 ⁴
Direct-reduced iron	4,740	5,000 ^e	5,280	5,620	6,410
Ferrochromium ^c	11,505 ⁴	8,430	8,000	10,000	7,750 ⁴
Ferrosilicon ^c	40,000	40,000	40,000	40,297 ^{r,4}	50,140 ⁴
Steel, crude, ingots and castings	6,600 ^e	6,890	7,293	7,869	8,382
Lead:					
Mine output, concentrate:					
Gross weight	35,590 ^r	39,093 ^r	38,054 ^r	39,093 ^r	42,018
Pb content ^c	18,000 ^r	19,000 ^r	19,000 ^r	20,000 ^r	22,000
Refinery output, includes secondary ^c	50,000	53,000	50,000	11,342 ^{r,4}	17,857 ⁴
Manganese, mine output, (30% to 35% Mn):					
Gross weight	105,000 ^c	120,994	123,148	115,680 ^r	128,924
Mn content ^c	32,000	40,000 ^r	42,000 ^r	38,000 ^r	43,000
Molybdenum, mine output, concentrate:					
Gross weight	3,543 ^r	4,506 ^r	4,271 ^r	4,084 ^r	3,367
Mo content ^c	1,900 ^r	2,400 ^r	2,300 ^r	2,200 ^r	1,800
Silver, mine output, Ag content	22	22	23	23	25
Zinc:					
Mine output, concentrate:					
Gross weight	182,000	250,000 ^r	220,000 ^r	222,000 ^r	244,006
Zn content ^c	90,000	120,000	120,000	110,000 ^r	121,000
Metal	51,475 ^r	73,000	82,571 ^r	78,428 ^r	109,400

See footnotes at end of table.

TABLE 1--Continued
 IRAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2000	2001	2002	2003	2004 ^P	
INDUSTRIAL MINERALS						
Asbestos:						
Concentrate, (3% to 8% marketable fiber)	65,900 ^r	75,000 ^r	70,000 ^r	9,816 ^r	82,018	
Marketable fiber ^c	2,000	2,000	1,500	1,470 ^{r,4}	6,000	
Barite	243,868 ^r	195,539	178,652	196,169 ^r	275,607	
Boron, borax	2,755 ^r	3,212	2,079	3,361 ^r	2,142	
Cement, hydraulic	thousand metric tons	23,880	26,640	28,600	30,460 ^r	32,198
Clays:						
Bentonite	163,364 ^r	113,299 ^r	125,510 ^r	140,528 ^r	193,046	
Industrial clays ^c	450,000	485,000 ⁴	490,000	490,000	500,000	
Kaolin	605,910 ^r	635,888 ^r	553,782 ^r	484,501 ^r	531,109	
Diatomite	2,000 ^r	-- ^r	1,879 ^r	9,500 ^r	8,028	
Feldspar	156,000	204,078	191,316	242,898 ^r	252,713	
Fluorspar	25,302 ^r	35,986	32,006	41,094 ^r	41,220	
Gemstones, turquoise ^c	kilograms	20,000	20,000	20,000	20,000	
Gypsum	thousand metric tons	10,427 ^r	10,382 ^r	13,535 ^r	13,828 ^r	12,594
Industrial or glass sand (quartzite and silica) ^c	1,000,000	1,700,000	1,700,000	1,700,000	1,700,000	
Lime	thousand metric tons	41,821 ^r	41,026 ^r	42,620 ^r	46,170 ^r	52,804
Magnesite	141,000 ^e	133,778	128,565	87,795 ^r	88,194	
Mica	3,606 ^r	3,255	2,845	5,500 ^r	7,032	
Nepheline syenite	--	6,650	75,000	75,500	63,798	
Nitrogen:						
N content of ammonia	965,000	1,086,700	1,119,100	1,115,100 ^r	1,087,700	
N content of urea	624,000 ^e	651,000 ^e	732,700 ^r	734,200 ^r	717,800	
Perlite	28,000 ^r	18,130 ^r	20,000 ^r	26,495 ^r	31,259	
Phosphate rock:						
Ore	169,331	213,338	303,000	194,000	229,575	
P ₂ O ₅ content ^c	20,000	26,000	36,000	23,000	28,000	
Pigments, mineral, natural iron oxide, ochre ^c	13,500	1,000 ^{r,4}	2,300 ^{r,4}	2,300	2,500	
Pumice and related volcanic materials ^c	150,000	760,000 ⁴	810,000	1,200,000	1,200,000	
Salt	1,984,931 ^r	1,558,668 ^r	1,664,496 ^r	2,002,899 ^r	1,790,669	
Soda ash ^c	120,000	120,000	120,000	120,000	120,000	
Sodium compound, caustic soda ^c	20,000	20,000	22,000	22,000	22,000	
Stone:						
Construction and building, crushed ⁶	thousand metric tons	11,783 ^r	16,450 ^r	19,809 ^r	21,383 ^r	25,369
Dimension and decorative:						
Granite	do.	247 ^r	401 ^r	620 ^r	838 ^r	1,019
Marble, blocks and slabs ⁷	do.	2,970 ^r	3,460 ^r	3,462 ^r	4,014 ^r	4,068
Travertine, blocks	do.	574 ^r	678 ^r	728 ^r	935 ^r	1,360
Total	do.	3,790 ^r	4,540 ^r	4,810 ^r	5,790 ^r	6,450
Dolomite	do.	303 ^r	223 ^r	439 ^r	522 ^r	600
Limestone ^c	do.	35,000	41,800	41,100	41,100	43,000
Strontium, celestite ^c	2,000	2,000	2,000	2,100 ^{r,4}	7,500 ⁴	
Sulfates, natural: ^c						
Aluminum potassium sulfate (alum)	12,000	10,000	10,000	1,000	1,000	
Sodium sulfate	420,000 ⁴	387,000 ⁴	580,000	580,000	600,000	
Sulfur: ^c						
Byproduct of petroleum and natural gas	963,000	880,000 ⁴	1,200,000 ⁴	1,310,000	1,400,000	
Byproduct of metallurgical processing, S content of acid	50,000	50,000	50,000	50,000	60,000	
Total	1,010,000	930,000 ^r	1,250,000	1,360,000	1,460,000	
Talc	26,741 ^r	60,282 ^r	68,007 ^r	57,000 ^r	108,541	

See footnotes at end of table.

TABLE 1--Continued
 IRAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2000	2001	2002	2003	2004 ^P	
MINERAL FUELS AND RELATED MATERIALS						
Coal	thousand metric tons	2,002 ^r	1,981 ^r	2,076 ^r	1,902 ^r	2,498
Coke	do.	1,152 ^r	1,095 ^r	1,055 ^r	1,004 ^r	1,021
Gas, natural: ^c						
Gross	million cubic meters	120,000	120,000	120,000	125,000	137,000
Dry	do.	60,200 ^r	66,000 ^r	75,000 ^r	81,500 ^r	89,663 ⁴
Plant liquids	thousand 42-gallon barrels	25,000	25,000	25,000	25,000	25,000
Petroleum:						
Crude	do.	1,360,000	1,350,000	1,250,000	1,366,000 ^{r,4}	1,399,000 ⁴
Refinery products: ^c						
Liquefied petroleum gases	do.	16,000	16,000	16,000	16,000	17,000
Motor gasoline	do.	65,000	67,000 ^r	67,000 ^r	67,000 ^r	68,000
Jet fuel	do.	12,000	13,000 ^r	14,000 ^r	14,000 ^r	14,000
Kerosene	do.	40,000	44,000 ^r	46,000 ^r	46,000 ^r	46,000
Distillate fuel oil	do.	140,000	130,000 ^r	135,000 ^r	140,000	140,000
Residual fuel oil	do.	160,000	145,000 ^r	152,000 ^r	160,000	160,000
Other	do.	67,000	65,000 ^r	95,000 ^r	100,000	100,000
Total	do.	500,000	480,000 ^r	525,000 ^r	543,000 ^r	545,000

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

¹Table includes data available through November 1, 2005.

²Data are for Iranian years ending March 21 of that stated, except data for alumina, natural gas, natural-gas-plant liquids, and petroleum, which are for Gregorian calendar years.

³In addition to commodities listed, the following may have been produced, but information is inadequate to estimate output: antimony, bromine, ferromolybdenum, nepheline syenite, phosphate rock, selenium, shell, silicomanganese, vermiculite, and zeolite.

⁴Reported figure.

⁵Includes gold recovered from the Mouteh gold mine and from the Sarcheshmeh copper complex.

⁶Includes marble and travertine.

⁷Includes marmarite.