



# 2011 Minerals Yearbook

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## THE MIDDLE EAST

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# THE MINERAL INDUSTRIES OF THE MIDDLE EAST

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The countries and territories of the Middle East region that are covered in this volume are Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, the United Arab Emirates (UAE), the West Bank and Gaza Strip, and Yemen. This region covers an area of about 6.3 million square kilometers. In 2011, the population of the Middle East region was estimated to be about 294 million, or 4.2% of the world's population. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE were members of the Cooperation Council for the Arab States of the Gulf, also known as the Gulf Cooperation Council (GCC). The region also included 2 members of the Organisation for Economic Co-operation and Development (OECD) (Israel and Turkey), 6 of the 12 member countries that make up the Organization of the Petroleum Exporting Countries (OPEC) (Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the UAE), and 7 of the 11 member countries that make up the Organization of Arab Petroleum Exporting Countries (OAPEC) (Bahrain, Iraq, Kuwait, Qatar, Saudi Arabia, Syria, and the UAE) (table 1).

## Acknowledgments

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For mineral production statistics—

- Iraq—State Company of Geological Survey and Mining (GEOSURV-IRAQ), Ministry of Industry and Minerals, and Ministry of Oil;
  - Israel—Department of Quarries and Mines of the Ministry of Energy and Water Resources;
  - Jordan—Department of Statistics, Ministry of Energy and Mineral Resources, and the Natural Resources Authority;
  - Kuwait—Central Statistical Office of the Ministry of Planning;
  - Qatar—Qatar Statistics Authority and the Ministry of Energy and Industry;
  - Saudi Arabia—Central Department of Statistics and Information of the Ministry of Economy and Planning, and Deputy Ministry for Mineral Resources of the Ministry of Petroleum and Mineral Resources;
  - Turkey—General Directorate of Mining Affairs of the Ministry of Energy and Natural Resources;
  - United Arab Emirates—National Bureau of Statistics; and
  - Arab Fertilizer Association.
- For basic economic and population data—
- International Monetary Fund and the World Bank Group.

## General Economic Conditions

In 2011, the gross domestic product (GDP) of the Middle East region was about \$4.1 trillion, which accounted for 5.2% of the world's GDP based on purchasing power parity. The rate of growth for many of the economies of Middle Eastern countries decreased in 2011 compared with that of 2010. Qatar remained the country with the fastest economic growth rate (estimated to be 14.1%) in the Middle East region. Decreases in economic growth, which were attributed to civil conflict and disturbances, were noted for Yemen (-10.5%) and Syria (-2.3%) in 2011. For most of the countries of the region, economic growth was driven mainly by exports of hydrocarbons to the world market. The economies of most of the oil-producing nations in the region were sustained by the high international market prices for crude oil (table 2; U.S. Energy Information Administration, 2012).

The mineral fuels industry affects the entire region, both through the wealth it creates and the movement of labor. Most of the countries in the region were undertaking efforts to diversify their economies. Production of metals and industrial minerals was a significant factor in the economies of Iran and Turkey; metal production also was a factor in the nonfuel economies of Bahrain, Oman, Qatar, Saudi Arabia, and the UAE.

Low-cost electric energy from the region's abundant supply of oil and natural gas (especially in Iran and most of the GCC countries) and the region's geographic location (which allows for access to ocean transportation) continued to provide a basis for the region's development of energy-intensive mineral industries to produce aluminum, cement, crude steel, direct-reduced iron (DRI), fertilizers, petrochemicals, and rolled steel. These industries were essential for the economic diversification efforts in the region, especially in the countries that depend heavily on hydrocarbon exports to sustain economic growth.

## Legislation

Iran was subject to numerous sanctions based upon concerns about the country's nuclear enrichment program, including those of the European Union and the United States. In 2011, the United States issued Executive Orders 13574 and 13590, which authorized the implementation of additional sanctions.

As of yearend 2011, Iraq's draft gas and oil legislation known as the Hydrocarbon Law, which was first proposed in 2007, remained stalled because of disagreements among Iraqi parties on wider political issues, including revenue sharing. The proposed law would create an oil and gas council to oversee the country's oil and gas sector and would establish the Iraq National Oil Co. The proposed law also contains arrangements for petroleum revenue sharing through the creation of an Oil Revenue Fund and a Future Fund.

Syria was subject to various economic sanctions based upon the Government's violent response to domestic protests.

In 2011, a new series of sanctions was issued by the Arab League, the Canadian Government, the European Union, and the U.S. Government.

A number of amendments to the Turkish mining law were enacted in 2010. The royalty rate for dimension and natural stone was decreased to 1% from 2% (Önder, 2006, 2010).

In December 2011, the Yemeni Parliament approved the Mines and Quarries Law (law No. 22 of 2010). The new law regulates artisanal mining operations, mineral exploration and prospecting, and mine production.

## Exploration

In 2011, mineral exploration was most notable in Turkey. Exploration was also ongoing in Iran, Oman, Saudi Arabia, and Yemen. Exploration for such precious metals as gold and silver was the focus of exploration activity in the region. Other explored-for metals included antimony, cobalt, copper, lead, molybdenum, nickel, and zinc. In 2011, metal exploration activity was most notable in Iran, Saudi Arabia, Turkey, and Yemen (table 3).

Local and international mineral exploration companies were allowed to explore for minerals in most of the countries of the region. Government agencies engaged in mineral prospecting and general exploration included the Geological Survey of Iran, the Department of Geological Survey of the Directorate General of Minerals of Oman, the Saudi Geological Survey, and the General Directorate of Mineral Research and Exploration of Yemen.

Exploration activities for natural gas continued in such countries as Iran, Israel, Kuwait, Saudi Arabia, Syria, Turkey, and Yemen. State-owned and international oil companies explored for hydrocarbons in many of the countries in the region. In 2011, crude oil discoveries were reported in Iran, Iraq, Kuwait, Oman, and Syria, and natural gas discoveries were reported in Iran, Syria, and Yemen (Organization of Arab Petroleum Exporting Countries, 2012, p. 20, 22).

## Commodity Overview

In 2011, the Middle East region was responsible for about 33% of the world's total crude oil production and 16% of the world's natural gas output. Additionally, the region accounted for 22% of the world's gypsum production; refined petroleum products, 11%; potash, 10%; chromite, 9%; and ammonia, 7% (table 4; BP p.l.c., 2012, p. 22).

In tables 5 through 12, estimates for the production of major mineral commodities for 2014 and beyond have been based upon supply-side assumptions, such as announced plans for increased production/new capacity construction, and bankable feasibility studies. The outlook tables in this summary chapter show historic production and projected production trends; therefore, no indication is made about whether the data are estimated or reported, and revisions are not identified. Data on individual mineral commodities in the tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current (2011) producing facilities and on planned new facilities that

operating companies, consortia, or Governments have projected to come online within indicated timeframes. Forward-looking information, which includes estimates of future production, exploration and mine development, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will take place.

## Metals

**Aluminum.**—In 2011, the Middle East region's share in the world's aluminum production was about 9% (table 4). Aluminum production capacity in the Middle East is expected to increase by 75% from about 3.8 million metric tons per year (Mt/yr) in 2011 to about 6.6 Mt/yr by 2018 following the completion of the new smelters in the region (which included those being built by South Aluminum Corp. in Iran and Ma'aden in Saudi Arabia), and the planned expansion of several smelters in the region. In addition to primary aluminum production, there were a number of existing downstream facilities in such countries as Bahrain, Oman, Qatar, and the UAE that produced value-added aluminum products (table 5).

**Bauxite and Alumina.**—In Saudi Arabia, Ma'aden Bauxite and Alumina Co., which was the joint venture of Saudi Arabian Mining Co. (Ma'aden) (74.9% interest) and Alcoa Inc. of the United States (25.1% interest), continued to develop a metallurgical-grade bauxite mine at Al Baitha. Initial mine production was expected to begin in 2014. Bauxite would be shipped by rail to Ma'aden's alumina refinery at Ras Al Khair, which also was under construction. Ma'aden also produced low-grade bauxite from the Az Zabirah Mine that was used by the construction industry. When the Al Baitha Mine reaches full production, which was scheduled to be achieved in 2015, Saudi Arabia's bauxite output was expected to exceed the combined capacity of the region's other bauxite producers in Iran and Turkey (table 6; Saudi Arabian Mining Co., 2012, p. 10).

**Chromium.**—The Middle East region accounted for 9% of the world's production of chromite in 2011. Turkey ranked as the most significant producer in the region followed by Oman, Iran, and the UAE, respectively (table 4).

**Copper.**—The Middle East region was a minor contributor to the world's copper supply. Iran was the most notable copper producer in the region. New copper production projects included those of National Iranian Copper Industries Co. (NICICO), which, as part of the latest Iranian 5-year plan, expected to increase the company's copper ore output. NICICO proposed to develop additional copper mine capacity with the construction of the Chah Firooz, the Chah Mesi, the Dareh Alo (also transliterated as Daraloo or Dar Alou), the Darreh Zar, the Haft Cheshmeh, the Ijoo, the Kahang, the Masjed Daghi, the Nochun, and the Taft copper mines (table 7; National Iranian Copper Industries Co., 2012, slides 1–32).

Iran was expected to expand its primary copper smelting and refining capacity (table 8). NICICO planned to build copper refineries at the Shahre Babak copper complex, which included the Miduk copper mine and the Khatoonabad smelter, and at the

Sungun copper complex. Solvent extraction and electrowinning (SX/EW) facilities were planned for the Chah Firooz, the Dareh Alo, the Miduk, the Sungun, and the Taft Mines. Iran also had a significant secondary copper refining capacity. The availability of international funding for capital-intensive development of mineral-related projects by companies operating in Iran, however, was impaired by international economic sanctions, which were a response to the Government's nuclear programs.

In Israel, Arava Mines Ltd. continued work on the redevelopment of copper mining at Timna. Redevelopment work had been suspended in 2008. Arava, which was a subsidiary of AHMSA Steel Israel Ltd., expected to begin building a 24,000-metric-ton-per-year-capacity copper SX/EW facility at the mine in late 2012 (Coren, 2009; Altos Hornos de México, S.A.B. de C.V., 2012, p. 17).

In Saudi Arabia, Al Masane Al Kobra Mining Co. (AMAK), which was a venture of local investors and the Arabian American Development Co. of the United States, continued to develop the Al Masane project. AMAK expected to begin to produce copper and zinc concentrates from the Al Masane Mine in 2012.

**Gold.**—The Middle East's gold mines were modest contributors to the world's supply of precious metals. Turkey and Saudi Arabia were the major gold producers in the region. Minor producers (by volume) included Iran and Oman. The completion of planned increases in the production capacity of gold mines in Iran, Saudi Arabia, and Turkey would result in the region's mined gold production capacity reaching an annual volume of about 51 metric tons by 2018 (table 9).

**Iron and Steel.**—Continued demand for steel reinforcing bar (rebar) for concrete by the construction industry for residential housing and commercial projects spurred most of the planned expansions of steel production capacity in the Middle East. As a region, the Middle East was a minor contributor to the world's steel production, although Turkey, which was the Middle East's leading steel producer and exporter, was ranked 10th among steel-producing countries. Turkey was responsible for about 60% of the region's total production of steel followed by Iran, which produced about 23%, and Saudi Arabia, which produced 9% of the region's steel production (table 10; World Steel Association, 2012).

For many countries of the region, a large segment of the fast-growing population was young in age. In Iraq and Yemen, about 40% of the population was estimated to be younger than 14 years of age, as was about 30% of the population of Saudi Arabia and more than 20% of the population of Iran and Turkey. New household creation was expected to increase the demand for housing significantly, and many of the Middle East region's new housing units were expected to be located in urban areas, which would increase the demand for steel construction products, especially steel rebar. In Saudi Arabia, the Government planned to add 500,000 housing units by 2015. In addition to housing, planned industrial and infrastructure projects in the region were expected to absorb additional volumes of construction material (such as aggregates, cement, copper, silica sand, and steel) (Global Investment House, 2011, p. 10–11; 2012, p. 19–20; United Nations, undated).

**Iron Ore.**—In the Middle East, iron ore was mined only in Iran and Turkey. Iran was the region's leading iron ore producer, and increases in Iranian iron ore production capacity were planned. A new iron ore mine was expected to be opened at Chah Gaz in 2013. In addition, the expansions of the production capacities of the iron ore mines of Chadormalu Mining and Industrial Co., Gol-e-Gohar Iron Ore Co., and Sangan Iron Ore Co. were expected to be completed by 2016.

National Mining Co. of Saudi Arabia and STX Heavy Industries of the Republic of Korea signed a contract to advance the development of the Wadi Sawawin deposit in northwestern Saudi Arabia. The Wadi Sawawin project's planned iron ore mine and 5-Mt/yr-capacity iron ore pelletizing plant was scheduled to begin production by 2016, but development remained subject to the availability of funding and Government approvals (table 11; London Mining p.l.c., 2011).

In 2011, Turkey produced about 5.8 million metric tons (Mt) of iron ore, which contained about 3 Mt of iron, from mines in Sivas Province that were owned and operated by Erdemir Madencilik Sanayi ve Ticaret A.Ş. (a subsidiary of Ereğli Demir ve Çelik Fabrikaları T.A.Ş.) and in Malatya Province by Hekimhan Madencilik İthalat İhracat San. ve Tic. A.Ş. (a subsidiary of Kolin İnşaat Turizm San. ve Tic. A.Ş.). Erdemir expected to develop a new mine in Malatya Province by 2016; the output of the new mine would substitute for the iron ore production from mines that were expected to deplete their reserves in the next few years.

### *Industrial Minerals*

**Diamond.**—Although the Middle East did not produce any rough diamond from mines, diamond cutting and trading was a notable segment of the mineral economies of Israel, Lebanon, and the UAE, all of which were Kimberley Process Certification Scheme participants.

Israel was one of the world's leading diamond cutting and trading centers; domestic diamond cutting and polishing companies specialized in large, high-value gemstones. In 2011, Israel's rough diamond imports of 22.6 million carats were valued at \$5.3 billion compared with imports of 26.7 million carats that were valued at \$4.4 billion in 2010. According to data provided by the Israel Diamond Institute Group of Companies, Israel exported 3.3 million carats of polished diamond in 2011, which was valued at \$7.2 billion. The United States was Israel's leading market for Israeli polished diamond. In 2011, according to Kimberley Process Certification Scheme rough diamond statistics, an additional 18.6 million carats of rough diamond, which was valued at \$4.4 billion, was reexported from Israel (Kimberley Process Certification Scheme, 2011, 2012; Israel Diamond Institute Group of Companies, 2012; U.S. Census Bureau, 2013).

According to Kimberley Process Certification Scheme rough diamond statistics, Lebanese rough diamond imports were valued at about \$205 million in 2011 compared with \$120 million in 2010. Lebanon reported that the value of rough diamond reexports in 2011 was \$296 million compared with \$117 million in 2010. About 68% of these rough diamond

exports was shipped to the European Community, and 32%, to the UAE (Kimberley Process Certification Scheme, 2011, 2012).

In the UAE, Dubai Diamond Exchange (DDE), which was a subsidiary of Dubai Multi Commodities Centre Authority (DMCC), was one of the leading diamond trade centers in the world. Belgium and India were the UAE's major diamond trading partners. In 2011, the UAE imported 51.9 million carats of rough diamond, which was valued at \$3.4 billion. The value of the DMCC polished diamond exports in 2011 decreased to \$14.63 billion compared with \$14.65 billion in 2010 owing to the slight decrease in the volume of the UAE's polished diamond exports in 2011 to 72.9 million carats from about 73.7 million carats in 2010. The UAE also reexported 47.4 million carats of rough diamond in 2011 that was valued at \$5.9 billion (Dubai Multi Commodities Centre Authority, 2012).

### **Mineral Fuels**

**Coal.**—Iran and Turkey were the only countries in the Middle East region that produced coal. Turkey was the region's predominant coal miner. Spurred in part by the effects of international economic sanctions, which limited coal imports, Iran planned to double its domestic coal-production capacity to more than 4.5 Mt/yr by yearend 2013. In Turkey, coal production was used primarily for electrical power generation. Although the Turkish Government encouraged the use of natural gas for new electrical power generation projects and retained control of hydroelectric generating facilities, many of Turkey's lignite and subbituminous coal operations and associated mine-mouth electrical power generating plants had been divested to the private sector in the past decade, so coal production could vary, depending on the demand for electric power not met by imported natural gas. In the near future, Turkey was expected to produce slightly less coal than in 2011 when 95 Mt was produced (table 12).

**Natural Gas and Petroleum.**—BP p.l.c. reported that the region accounted for 38.4% of worldwide natural gas reserves. Iran held 15.9% of the world's reserves and Qatar accounted for 12% (BP p.l.c., 2012, p. 20).

The share of the Middle East region in the world's crude oil production increased to about 33% in 2011 from 31% in 2010. Saudi Arabia was the leading petroleum producing country in the world, in terms of the volume of production, with output of 3.3 billion 42-gallon barrels (Gbbbl) in 2011. Other notable crude oil producing countries in the region (based on production volume) included Iran (ranked 4th in the world), the UAE (7th), Kuwait (9th), and Iraq (11th) (table 4; BP p.l.c., 2012, p. 8).

According to BP, the region's proved crude oil reserves were estimated to be 795 Gbbbl, or about 48% of the world's total crude oil reserves. Saudi Arabia held 16.1% of proved worldwide oil reserves; Iran, 9.1%; Iraq, 8.7%; Kuwait, 6.1%, and the UAE, 5.7% (BP p.l.c., 2012, p. 6).

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TABLE 1  
MIDDLE EAST: AREA AND POPULATION IN 2011

Country/Territory	Area <sup>1</sup> (square kilometers)	Estimated population <sup>2</sup> (millions)
Bahrain	760	1.3
Iran	1,648,195	74.8
Iraq	438,317	33.0
Israel	20,770	7.8
Jordan	89,342	6.2
Kuwait	17,818	2.8
Lebanon	10,400	4.3
Oman	309,500	2.8
Qatar	11,586	1.9
Saudi Arabia	2,149,690	28.1
Syria	185,180	20.8
Turkey	783,562	73.6
United Arab Emirates	83,600	7.9
West Bank and Gaza Strip	6,220	4.0
Yemen	527,968	24.8
Total	6,282,908	294.0
World	510,072,000	6,973.7

<sup>1</sup>Source: U.S. Central Intelligence Agency, The World Factbook.

<sup>2</sup>Source: The World Bank, 2012 World Development Indicators Database.

TABLE 2  
MIDDLE EAST: GROSS DOMESTIC PRODUCT<sup>1,2</sup>

Country/Territory	Gross domestic product in 2011 based on purchasing power parity		Real gross domestic product growth rate (percentage)		
	Gross value (million dollars)	Per capita (dollars)	2009	2010	2011
Bahrain	31,303	27,735	3.2	4.7	2.1
Iran	990,771	13,184	4.0	5.9	2.0
Iraq	138,782	4,225	2.9	3.0	8.9
Israel	236,994	31,467	0.8	5.7	4.6
Jordan	36,939	5,907	5.5	2.3	2.6
Kuwait	153,538	41,701	-7.8	2.5	8.2
Lebanon	61,443	15,523	8.5	7.0	1.5
Oman	84,997	27,567	3.9	5.0	5.4
Qatar	174,939	97,948	12.0	16.7	14.1
Saudi Arabia	687,655	24,411	0.1	5.1	7.1
Syria <sup>3</sup>	107,600	5,100	5.9	3.4	-2.3
Turkey	1,075,467	14,393	-4.8	9.2	8.5
United Arab Emirates	256,519	47,729	-4.8	1.3	5.2
West Bank and Gaza Strip <sup>3</sup>	8,020	2,900	7.0	6.8	5.7
Yemen	57,966	2,307	3.9	7.7	-10.5
Total	4,102,993	XX	XX	XX	XX
World total	78,969,782	XX	-0.6	5.1	3.8

XX Not applicable.

<sup>1</sup>Source: International Monetary Fund, World Economic Outlook Database, October 2012.

<sup>2</sup>Gross domestic product listed may differ from that reported in individual country chapters owing to differences in the source or date of reporting.

<sup>3</sup>Source: U.S. Central Intelligence Agency, The World Factbook.

TABLE 3  
SELECTED MIDDLE EAST EXPLORATION ACTIVITY IN 2011<sup>1</sup>

Country	Type <sup>2</sup>	Prospect	Commodity	Companies	Resource notes <sup>3,4</sup>	Exploration notes
Saudi Arabia	E	Atlantis II Deeps	Mn, Zn, Cu, Ag	Joint venture of Diamond Fields International Ltd., 50.1%, and Manafa International Trade Co., 49.9%	2.2 Mt Mn, 1.6 Mt Zn, 372,000 t Cu, 3,330 t Ag (IF)	Ongoing exploration.
Do.	F	Khnaiguiyah	Zn, Cu	Khnaiguiyah Mining Company LLC (KMC) [Alara Resources Ltd., 50%, and United Arabian Mining Company LLC (Manajem), 50%]	1 Mt Zn, 43,000 t Cu (D)	Ongoing exploration.
Turkey	E	Agi Dagi	Au, Ag	Kuzey Biga Madencilik San. Tic. A.Ş. (Alamos Gold Inc., 100%) <sup>5</sup>	263 t Ag, 47 t Au (D)	Ongoing exploration.
Do.	E	Akarca	Au, Ag	AES Madencilik Ltd. Sti. (Eurasian Minerals Inc., 50%, and Centerra Gold Inc., 50%)	Data not released	Ongoing exploration.
Do.	E	Altintepe	Au	NS Madencilik Sanayi ve Ticaret A.Ş. (Stratex International plc., 100%) <sup>5</sup>	18 t Au (T)	Ongoing exploration.
Do.	E	Balya	Zn, Pb, Ag	Dedeman Madencilik San. ve Tic. A.Ş.	Data not released	Ongoing exploration.
Do.	E	Bursa	Cu, Mo, Au, Ag	Joint venture of Empire Mining Corp., 65%, and Yeni Anadolu Mineral Madencilik Sanayi ve Ticaret Limited Şti., 35%	Data not released	Ongoing exploration.
Do.	P	Cayeli	Cu, Zn, Au, Ag	Çayeli Bakir İşletmeleri A.Ş. (Immet Mining Corp., 100%)	275,000 t Cu, 368,000 t Zn, 317 t Ag, 4 t Au (R)	Ongoing drilling.
Do.	P	Copler	Au, Ag, Cu	Anagold Madencilik Sanayi ve Ticaret A.Ş. (Alacer Gold Corp., 95%, and Lidya Madencilik Sanayi ve Ticaret A.Ş., 5%)	210,000 t Cu, 663 t Ag, 224 t Au (D)	Ongoing drilling.
Do.	P	Efemcukuru	Au	Tüprağ Metal Madencilik Sanayi ve Ticaret A.Ş. (Eldorado Gold Corp., 100%)	46 t Au (R)	Ongoing drilling.
Do.	E	Goyruk	Sb	Tri-Star Resources Corp.	Data not released	Ongoing exploration.
Do.	E	Halilaga	Au, Cu, Mo	Joint venture of Teck Madencilik Sanayi ve Ticaret A.Ş., 60%, and Pilot Gold Inc., 40%	Data not released	Ongoing exploration.
Do.	E	Hasancelebi	Au	Joint venture of Stratex International plc. and Teck Madencilik Sanayi ve Ticaret A.Ş.	Data not released	Ongoing exploration.
Do.	F	Inlice	Au	Inlice Madencilik A.Ş. (NTF İnşaat Ticaret Limited Şti., 55%, and Stratex International plc., 45%)	2 t Au (D)	Completed feasibility study.
Do.	P	Kaymaz	Au, Ag	Koza Altın İşletmeleri A.Ş. (ATP İnşaat ve Ticaret A.Ş., 60%, and Koza İpek Holding A.Ş., 40%)	16 t Au, 19 t Ag (R)	Commenced production.
Do.	E	Kestanelik	Au, Ag	Chesser Resources Ltd.	Data not released	Ongoing exploration.
Do.	P	Kisladağ	Au	Tüprağ Metal Madencilik A.Ş. (Eldorado Gold Corp., 100%)	327 t Au (R)	Ongoing drilling.
Do.	E	Muratdere	Cu, Au, Ag, Mo, Re	Stratex International plc. <sup>5</sup>	186,000 t Cu, 6,400 t Mo, 121 t Ag, 18 t Re, 6 t Au (IF)	Ongoing exploration.

See footnotes at end of table.

TABLE 3—Continued  
SELECTED MIDDLE EAST EXPLORATION ACTIVITY IN 2011<sup>1</sup>

Country	Type <sup>2</sup>	Prospect	Commodity	Companies	Resource notes <sup>3,4</sup>	Exploration notes
Turkey	E	Oksut	Au	Joint venture of Centerra Gold Inc. and Stratex International plc	56 t Au (T)	Ongoing exploration.
Do.	E	Red Rabbit (Kiziltepe sector)	Au, Ag	Zenit Madencilik Sanayi ve Ticaret Limited Şti. [Galata Madencilik Sanayi ve Ticaret Limited Şti. (Ariana Resources plc.), 50%, and Proceca Construction Co., 50%]	78 t Ag, 5 t Au (D)	Ongoing exploration.
Do.	E	Salinbas	Au	Pontid Madencilik Sanayi ve Ticaret Limited Şti., (Eldorado Gold Corp., 51%, and Ariana Resources plc, 49%)	Data not released	Ongoing exploration.
Do.	E	Sivas	Au, Ag	RCR Quantum Mining A.Ş., (Red Crescent Resources Ltd., 75%, and Gensay Madencilik Sanayi ve Ticaret Ltd., 25%)	Data not released	Ongoing exploration.
Do.	E	Temrezli	U	Adur Madencilik Limited Şti. (Aldridge Uranium Ltd., 65%, and Anatolia Energy Ltd., 35%)	4,900 t U <sub>3</sub> O <sub>8</sub> (ID)	Ongoing exploration.
Do.	E	Tufanbeyli	Zn, Pb, Ag	Red Crescent Resources Ltd.	105,000 t Zn, 300 t Pb, 10 t Ag (IF)	Completed technical report.
Do.	E	TV Tower	Au, Cu, Ag	Joint venture of Teck Madencilik Sanayi ve Ticaret A.Ş., 60%, and Pilot Gold Inc., 40%	Data not released	Ongoing exploration.
Do.	E	Yenipazar	Au, Ag, Cu, Pb, Zn	Aldridge Minerals Madencilik Limited Şti. (Aldridge Minerals Inc., 100%)	374,000 t Zn, 277,000 t Pb, 80,000 t Cu, 34 t Ag, 28 t Au (ID)	Ongoing exploration.
Do.	E	Yusufuli	Au, Cu, Ag, Pb, Zn	Akdeniz Resources Madencilik A.Ş. (Mediterranean Resources Ltd.)	154,000 t Zn, 64,000 t Pb, 29,000 t Cu, 49 t Au, 40 t Ag (ID)	Ongoing exploration.
Yemen	E	Al Hariqah	Au	Cantex Mine Development Corp.	26 t Au (ID)	Ongoing exploration.
Do.	E	Suwar	Ni, Cu, Co, Pt	do.	Data not released	Ongoing exploration.

Do., do. Ditto.

<sup>1</sup>Abbreviations used for commodities in this table include the following: Ag—silver; Au—gold; Co—cobalt; Cu—copper; Mn—manganese; Mo—molybdenum; Ni—nickel; Pb—lead; Pt—platinum; Re—rhenium; Sb—antimony; U—uranium; U<sub>3</sub>O<sub>8</sub>—uranium oxide; Zn—zinc.

<sup>2</sup>E—Active exploration; F—Feasibility work ongoing/completed; P—Exploration associated with producing site.

<sup>3</sup>Abbreviations used for units of measure include the following: Mt—million metric tons; t—metric tons.

<sup>4</sup>Based on 2011 data reported from various sources; D—measured + indicated; ID—indicated; IF—inferred; R—proven + probable; T—total resource. Resource data not verified by U.S. Geological Survey.

<sup>5</sup>In late 2011, Stratex signed new joint venture agreements, subject to the completion of due diligence by the partners, for the Alintepe and Muratdere projects.



TABLE 4  
MIDDLE EAST: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2011<sup>1</sup>  
(Thousand metric tons unless otherwise specified)

Country	Metals				Industrial minerals					Mineral fuels and related products		
	Aluminum, metal, primary	Chromite, mine output, gross weight	Steel, crude	Ammonia, N content	Cement, hydraulic	Gypsum	Phosphate rock, gross weight	Potash, K <sub>2</sub> O equivalent	Crude, including condensate (thousand 42-gallon barrels)	Refinery products (thousand 42-gallon barrels)	Petroleum	
Bahrain	881	--	--	380	800	--	--	--	69,452	95,776		
Iran <sup>e</sup>	224 <sup>2</sup>	100	13,000	2,500	66,000	12,000	330	--	1,440,000	627,000		
Iraq	--	--	--	150	10,000	713	132	--	897,900	201,334		
Israel <sup>e</sup>	--	--	430	--	5,200	100	3,105 <sup>2</sup>	2,100	12	92,100		
Jordan	--	--	150 <sup>e</sup>	--	6,000	255	7,643	1,355	7	25		
Kuwait <sup>e</sup>	--	--	500	520	2,250	--	--	--	1,000,000	335,000		
Lebanon	--	--	--	--	5,500	105	--	--	--	--		
Oman	373	617	84 <sup>e</sup>	1,120	5,000	1,254	--	--	325,215	77,110		
Qatar	480	--	1,821	1,919	4,300	135 <sup>e</sup>	--	--	628,895	49,238		
Saudi Arabia <sup>e</sup>	--	--	5,300	2,800	48,000	2,300	--	--	3,310,000	677,700 <sup>2</sup>		
Syria <sup>e</sup>	--	--	63	169	9,000	500	3,100	--	121,180 <sup>2</sup>	91,325 <sup>2</sup>		
Turkey <sup>e</sup>	60	1,900	34,000	200	63,405 <sup>2</sup>	6,400	1	--	16,400	156,000		
United Arab Emirates	1,750	(3)	2,000	386	18,000	40 <sup>e</sup>	--	--	1,212,530	167,966		
Yemen	--	--	--	--	3,500 <sup>e</sup>	100 <sup>e</sup>	--	--	93,220	35,843		
Total	3,770	2,620	57,300	10,100	247,000	23,900	14,300	3,460	9,110,000	2,610,000		
Share of world total	9%	9%	4%	7%	6%	22%	7%	10%	33%	11%		
United States	1,990	--	86,400	9,350 <sup>4</sup>	68,600	NA	28,100	1,020	2,060,000	NA		
World total	44,300	29,900	1,520,000	138,000	4,040,000	110,000	196,000	36,300	28,000,000	24,700,000		

<sup>e</sup>Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. NA Not available. -- Zero.

<sup>1</sup>Totals may not add due to independent rounding. Percentages are calculated on unrounded data. Table includes data available as of January 31, 2013.

<sup>2</sup>Reported figure.

<sup>3</sup>Less than 1/2 unit.

<sup>4</sup>Synthetic anhydrous ammonia; excludes coke oven byproduct ammonia.

TABLE 5  
MIDDLE EAST: HISTORIC AND PROJECTED PRIMARY AND SECONDARY ALUMINUM PRODUCTION, 2005–2018<sup>1</sup>

(Metric tons)

Country	2005	2010	2011	2014 <sup>e</sup>	2016 <sup>e</sup>	2018 <sup>e</sup>
Bahrain <sup>2</sup>	750,710	850,700	881,000	1,000,000	1,300,000	1,300,000
Iran	220,000	192,000	223,554	350,000	723,000	823,000
Oman	--	367,000	367,000	367,000	720,000	720,000
Qatar	--	190,000	480,000	585,000	585,000	585,000
Saudi Arabia	--	--	--	740,000	740,000	740,000
Turkey	60,000	60,000	60,000	60,000	80,000	80,000
United Arab Emirates	722,000	1,400,000	1,750,000	2,400,000	2,400,000	2,400,000
Total	1,750,000	3,060,000	3,760,000	5,500,000	6,500,000	6,600,000

<sup>e</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include some secondary aluminum produced from used beverage cans.

TABLE 6  
MIDDLE EAST: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2005–2018<sup>1</sup>

(Metric tons)

Country	2005	2010	2011	2014 <sup>e</sup>	2016 <sup>e</sup>	2018 <sup>e</sup>
Iran	437,595	681,235	600,000	710,000	710,000	710,000
Saudi Arabia <sup>2</sup>	--	--	--	2,000,000	4,000,000	4,000,000
Turkey	475,349	1,311,064	1,500,000	1,500,000	1,500,000	1,500,000
Total	910,000	2,000,000	2,100,000	4,200,000	6,200,000	6,200,000

<sup>e</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Does not include production of low-grade bauxite for cement, which began in 2008.

TABLE 7  
MIDDLE EAST: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 2005–2018<sup>1</sup>

(Metal content of concentrate in thousand metric tons)

Country	2005	2010	2011	2014 <sup>e</sup>	2016 <sup>e</sup>	2018 <sup>e</sup>
Iran	190	257	259	350	350	400
Israel	--	--	--	4	20	24
Oman	--	2	2	4	4	4
Saudi Arabia	1	2	2	65	65	65
Turkey <sup>2</sup>	46	97	80	85	85	85
Total	240	360	340	500	520	580

<sup>e</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Concentrate production estimated to be about 85% of mined ore (gross weight).

TABLE 8  
MIDDLE EAST: HISTORIC AND PROJECTED REFINED COPPER PRODUCTION, 2005–2018<sup>1,2</sup>

(Metric tons)

Country	2005	2010	2011	2014 <sup>e</sup>	2016 <sup>e</sup>	2018 <sup>e</sup>
Iran	178,000	220,000	227,000	440,000	440,000	700,000
Israel	--	--	--	4,000	20,000	24,000
Oman	24,543	15,000	16,000	32,000	32,000	32,000
Turkey	95,000	47,000	50,000	200,000	200,000	200,000
Total	300,000	280,000	290,000	680,000	690,000	960,000

<sup>e</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include secondary production.

TABLE 9  
MIDDLE EAST: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 2005–2018<sup>1</sup>

(Metal content in kilograms)

Country	2005	2010	2011	2014 <sup>c</sup>	2016 <sup>c</sup>	2018 <sup>c</sup>
Iran	1,000	2,000	2,000	4,000	4,000	4,000
Oman	384	82	--	100	100	100
Saudi Arabia	7,456	4,476	4,611	8,000	8,000	7,000
Turkey	4,170	16,890	25,000	30,000	40,000	40,000
Total	13,000	23,000	32,000	42,000	52,000	51,000

<sup>c</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 10  
MIDDLE EAST: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 2005–2018<sup>1</sup>

(Thousand metric tons)

Country	2005	2010	2011	2014 <sup>c</sup>	2016 <sup>c</sup>	2018 <sup>c</sup>
Iran	9,400	12,000	13,000	17,000	25,000	25,000
Iraq	--	--	--	1,500	2,000	2,000
Israel	480	430	430	480	480	480
Jordan	150	150	150	390	390	390
Kuwait	450	500	500	500	500	500
Oman	84	84	84	1,200	4,000	4,000
Qatar	1,057	1,975	1,820	2,000	2,000	2,000
Saudi Arabia	4,185	5,000	5,300	6,500	6,500	6,500
Syria	70	63	63	590	590	590
Turkey	2,960	29,030	34,000	35,000	43,000	43,000
United Arab Emirates	90	1,180	2,000	5,000	6,500	6,500
Total	19,000	50,000	57,000	70,000	91,000	91,000

<sup>c</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 11  
MIDDLE EAST: HISTORIC AND PROJECTED BENEFICIATED IRON ORE PRODUCTION, 2005–2018<sup>1</sup>

(Metal content in thousand metric tons)

Country	2005	2010	2011	2014 <sup>c</sup>	2016 <sup>c</sup>	2018 <sup>c</sup>
Iran	9,162	16,500	16,500	20,000	25,000	25,000
Saudi Arabia	--	--	--	--	4,700	4,700
Turkey	2,450	2,700	3,000	3,000	3,000	3,000
Total	12,000	19,000	20,000	23,000	33,000	33,000

<sup>c</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 12  
MIDDLE EAST: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 2005–2018<sup>1,2</sup>

(Thousand metric tons)

Country	2005	2010	2011	2014 <sup>c</sup>	2016 <sup>c</sup>	2018 <sup>c</sup>
Iran	1,898	2,300	2,300	4,500	4,500	4,500
Turkey	58,676	78,104	95,425	90,000	90,000	90,000
Total	61,000	80,000	98,000	95,000	95,000	95,000

<sup>c</sup>Estimated.

<sup>1</sup>Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes anthracite, bituminous, and lignite.