



# 2012 Minerals Yearbook

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OMAN

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# THE MINERAL INDUSTRY OF OMAN

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The Sultanate of Oman is one of the countries that make up the Cooperation Council for the Arab States of the Gulf, better known as Gulf Cooperation Council (GCC). Oman was the leading Middle East crude oil producer that was not a member of the Organization of the Petroleum Exporting Countries (OPEC). The country was the seventh-ranked crude oil producer and the fifth-ranked producer of natural gas in the Middle East and accounted for about 1.1% of the world's crude oil production and 0.9% of the total world production of natural gas. In addition to crude oil, natural gas, and refined petroleum products, Oman exported aluminum, building materials, chromium, copper, gypsum, iron and steel products, limestone, manganese, marble, and urea. The country also produced cement, clay, kaolin, quartz, salt, sand and gravel, silica sand, and sulfur, mainly for domestic use (table 1; BP p.l.c., 2013, p. 10, 22).

Although mining activity had been ongoing in Oman since the Bronze Age more than 4,000 years ago, the country's mineral resources are still relatively untapped, and vast resources of metals and industrial minerals are present. Oman's mountains host the Somail ophiolites, which are intact and exposed ophiolites likely to contain such metal deposits as chromite, cobalt, copper, gold, lead, magnesium, manganese, nickel, palladium, platinum, silver, vanadium, and zinc (Ministry of Petroleum and Minerals, 1985, p. 29; Kamoopuri, 2012).

## Minerals in the National Economy

Oman's gross domestic product (GDP) was projected to increase in nominal value to \$80 billion in 2012 from \$72.7 billion in 2011. The real economic growth rate was 5.0% in 2012 compared with a revised growth rate of 4.5% in 2011. The output of the crude oil sector accounted for 48.4% of the GDP; the natural gas sector, 3.8% of the GDP; and the industrial sector, 16.5% of the GDP. Oman's economic growth was driven by higher crude oil prices, which averaged \$109.60 per barrel in 2012 compared with \$102.95 per barrel in 2011, and by an increase of 3.5% in the volume of crude oil and condensate production. The Omani economy continued to be highly dependent on hydrocarbon revenues. During the 5-year period from 2008 to 2012, the value of hydrocarbon exports averaged about 70% of total exports and hydrocarbon revenue accounted for more than 80% of Government revenue. The share of the industrial sector, which included aluminum, nitrogen fertilizer, and steel manufacturing, in the overall GDP decreased to 16.5% in 2012 from a revised 17.8% in 2011. The mining and quarrying subsector, which made up 2% of the non-oil industrial sector, increased in value by 2.1% in 2012 compared with an increase of 8.3% in 2011. The value of building and construction subsector activity, which made up 29% of the activity of the non-oil industrial sector, increased by 4.7% compared with an increase of 5.8% in 2011 (Central Bank

of Oman, 2013, p. 16–18, 36; International Monetary Fund, 2013, p. 10).

## Government Policies and Programs

The Government policy document "Vision 2020" states that industrial diversification can be an instrument to achieve the development targets set by the Government. These targets include increasing the contribution of the non-oil sectors (including the natural gas sector) to 91% of the GDP and non-oil exports to 13% of the GDP by 2020. The Government had been working on reducing its dependence on hydrocarbon revenue by diversifying its economy through investing in mineral industries, such as aluminum production, and developing Oman's metallic and industrial mineral resources. In 2008, the Government created Takamul Investment Co. S.A.O.C to fund manufacturing and processing facilities to add more value to hydrocarbons, metals, and minerals produced in Oman. Takamul was owned by Oman Oil Co. S.A.O.C (OOC) (93.07%), and by Abu Dhabi Water and Electricity Authority (5.01%) and Al Maha Strategic Industries for Investments L.L.C. (1.92%) of the United Arab Emirates (UAE). Takamul financed several metal, mineral, and petrochemical production projects in the country, including Gulf Specialty Steel Industries L.L.C., Oman Aluminium Processing Industries L.L.C., Oman Aluminium Rolling Company L.L.C., and Sohar Sulphur Fertilizers L.L.C. (SSF). Takamul was considering financing the development of new aluminum and steel beneficiation projects as well as ferrochrome, magnesium, salt, and silicon production projects (Takamul Investment Co. S.A.O.C, 2013b).

In 2011, the Government contracted the environmental engineering consulting company Brenk Systemplanung GmbH of Germany to evaluate Oman's growing mineral sector. Brenk Systemplanung conducted a comprehensive review to introduce best practices in the development and marketing of Oman's mineral resources and to counsel on ways to improve and update guidelines and regulations for the mineral industry. The review discovered that 113 aggregates production companies did not adhere to the terms of their licenses and had been providing crushed aggregates in the local market at low prices. The review also found that some businesses were operating without a permit or operating outside of their designated sites. The Government took several steps to curb illegal quarrying and mining in the country and introduced laws that require mining companies to reinvest 5% of their profits into local communities (Prabhu, 2011; Gormley, 2013).

The Government was studying amendments to the existing mining law that would give priority to local industries to use mine output rather than export it. Other amendments were also being considered that would encourage local investment in the mineral sector and limit the transfer of mining licenses from one individual to another (Khan, 2012).

## Structure of the Mineral Industry

Mining law No. 3 of 2003 and its amendments granted the Government (represented by the Ministry of Commerce and Industry) ownership of all minerals wherever they are found in Oman. The Ministry of Commerce and Industry administers mining activities in the country and is responsible for issuing mining licenses, resolving mineral sector disputes, and protecting the environment. The Ministry of Oil and Gas manages the country's hydrocarbon sector, although the ultimate decision on the country's hydrocarbon policy and investment is decreed by the Sultan of Oman. The execution of the national policy in the hydrocarbon sector is carried out by Petroleum Development Oman L.L.C. (PDO). PDO, which is owned by the Government (60%), Royal Dutch Shell p.l.c. of the Netherlands (34%), Total S.A. of France (4%), and Partex (Oman) Corp. of Panama (2%), holds more than 90% of the country's oil reserves and produces more than 85% of the country's crude oil and almost all its natural gas. The Government owned 100% of OOC, 75% of Oil Refineries and Petroleum Industries Co. L.L.C. (ORPIC), 51% of Oman Liquefied Natural Gas L.L.C., and 46.84% of Qualhat Liquefied Natural Gas S.A.O.C (U.S. Energy Information Administration, 2012; Oman Oil Co. S.A.O.C, 2013). In 2012, 33 companies carried out mineral exploration in Oman.

Sohar Aluminium Co. L.L.C. was the sole primary aluminum producer in Oman. It was owned by OOC and Abu Dhabi National Energy Co. P.J.S.C. of the UAE (40% interest each), and Rio Tinto Alcan of Canada (20% interest) (Sohar Aluminium Co. L.L.C., 2013).

Oman India Fertiliser Co. S.A.O.G. (OMIFCO), which was a joint venture of OOC (50%), Indian Farmers Fertiliser Cooperative Ltd. (25%), and Krishak Bharati Cooperative Ltd. (25%) produced nitrogen fertilizer. The other producer of nitrogen fertilizer in Oman was Sohar International Urea & Chemical Industries S.A.O.G. (SIUCI) (a subsidiary of Suhail Bahwan Group) (Oman India Fertiliser Co. S.A.O.C, 2013; Suhail Bahwan Group, 2013).

Oman Cement Co. S.A.O.C, Raysut Cement Co. S.A.O.C, and Al Madinah Cement Co. L.L.C were the main producers of cement. Several small-, medium-, and large-size companies produced chromite in Oman in 2012, including Al Tamman Trading Establishment L.L.C., Gulf Mining and Materials Co., Hatton FZE, and Oman Chromite Co. S.A.O.G. Mawarid Mining L.L.C. (a wholly owned subsidiary of MB Holding Co. L.L.C. and the first privately owned mining company in Oman) produced copper ore and operated a copper concentrator. Government-owned Oman Mining Company L.L.C. (OMC) refined and sold copper concentrates (table 2).

Oman had more than 500 active industrial minerals mining operations, including 183 for crushed stone; 150 for landfill material; 71 for chromite; 57 for marble; 4 each for clay, gypsum, and laterite; 3 for sandstone; 2 for limestone for cement; and 1 each for salt and dune sand. Of more than 1.3 million private sector employees, about 14,900, or 1.1%, were employed in the mining and quarrying industry in 2012, which was an increase of 16% compared with the number employed in 2011 (Industrial Minerals, 2010; Central Bank of Oman, 2013, p. 30).

## Mineral Trade

In 2012, Oman's total merchandise exports increased in value by about 11% compared with an increase of 29% in 2011. This increase was attributable mainly to higher crude oil prices and to an increase in output in 2012 compared with that of 2011. Crude and refined oil and natural gas accounted for about 80% of Oman's goods exports (including reexports). Crude oil exports increased by about 11% in value and 3.9% in quantity in 2012 compared with an increase of 33% in value and 0.9% in quantity in 2011. The quantity of Omani crude oil exports increased on average to 766,600 barrels per day (bbl/d) in 2012 from 737,800 bbl/d in 2011. The value of liquefied natural gas (LNG) exports increased by about 10% in 2012 compared with an increase of 25% in 2011, and the value of refined petroleum products exports decreased by 20% compared with an increase of 34% in 2011. Oman exported 8.4 million metric tons (Mt) of LNG and 251,000 metric tons (t) of natural gas liquids. The value of non-oil exports increased by 18.5% compared with that of 2012; the increase was owing mainly to an increase in the value of mineral products by 137% and of base-metal and base-metal-related articles by about 24% compared with the values in 2011. The value of chemical products (which include fertilizers) decreased by about 9% compared with the value in 2011 (Central Bank of Oman, 2013, p. 43–46, 104, 107).

The United States and Oman signed a free-trade agreement that went into effect in 2009. The value of U.S. exports of goods to Oman increased in 2012 by about 22% to \$1,748 million from \$1,434 million in 2011. Most of the increase in the export value was attributed to increases in the export value of chemicals, extractive and metalworking machinery, finished metals, gold, industrial engines, military aircraft, passenger cars, and trucks. The value of U.S. imports from Oman decreased by about 39% to \$1,354 million from \$2,208 million in 2011. The significant decrease in import value was attributed to the decrease in the value of crude oil imports, which amounted to only \$364 million in 2012 compared with \$1,646 million in 2011. U.S. fertilizer imports (mainly urea) from Oman increased in value to \$485 million in 2012 from about \$150 million in 2011 (Office of the United States Trade Representative, 2013; U.S. Census Bureau, 2013).

## Production

Notable increases in Oman's mineral production in 2012 compared with that of 2011 included an increase in quartz output, by 58%; gypsum, by 53%; direct-reduced iron (DRI), by about 32%; limestone, by 29%; silica sand, by 23%; marble, by 21%; and dry natural gas, by 10%. Notable decreases in mineral output in 2012 compared with that of 2011 included a decrease in clay production, by 41%; chromite, by about 10%; and manganese, by 9%. In terms of tonnage, the leading mineral commodities produced were sand and gravel (69.5 Mt) followed by limestone (6.5 Mt) and cement (5.2 Mt) (table 1).

## Commodity Review

### Metals

**Aluminum.**—The Sohar aluminum smelter, which was owned and operated by Sohar Aluminium, produced 360,000 t of aluminum in 2012, which was a decrease of 3.5% compared with that of 2011. The company produced ingots, sows, and hot metal. The Sohar smelter used alumina imported from Australia by Oman Shipping Co. S.A.O.C, which had a long-term contract to ship 690,000 metric tons per year (t/yr) of alumina to Oman. Sohar Aluminium was preparing to begin a phase 2 expansion project, which would double the smelter's capacity to 720,000 t/yr from the current capacity of 360,000 t/yr and would cost \$2.4 billion. The project was expected to be completed in 2016 (Baxter, 2012; Sohar Aluminium Co. L.L.C., 2013).

Aluminium Rolling Co. L.L.C., which was one of Takamul Investment's leading value-added aluminum projects in Oman, was building an aluminum rolling mill at the Sohar Industrial Estate at a cost of \$385 million. The mill, which was being constructed by FATA EPC (a subsidiary of FATA S.p.A. of Italy), would have the capacity to produce 140,000 t/yr of multipurpose rolled aluminum sheets. The mill would be supplied with natural gas by OOC and was expected to be completed by yearend 2013 (Oman Oil Co. S.A.O.C, 2013; Takamul Investment Co. S.A.O.C, 2013a).

Oman Aluminium Processing Industries L.L.C. (OAPIL), which was also a joint venture of Takamul and Oman Cables Industries, was located in the Sohar Industrial Estate near the Sohar aluminum smelter. OAPIL had been producing electrical conductivity rods since 2010 using technology supplied by Southwire Co. of the United States (Takamul Investment Co. S.A.O.C, 2013a).

**Chromium.**—Oman held about 2% of the world's chromite reserves in its 450 chromite deposits. In 2012, Oman had more than 70 active chromite mining operations. Chromite mining in Oman is a low-cost operation because the shallow deposits allow for open pit mining, the moderate weather allows for year-round mining, and the developed infrastructure includes good roads and electricity. Chromite production in Oman decreased for the second year to 555,000 t from 617,000 t in 2011 and 865,000 t (revised) in 2010. The decrease was attributed to efforts by the Government and chromite producers to restrict ore exports and increase exports of higher concentrations of chromium oxide. Gulf Mining Material Co. owned and operated Oman's first chromite ore concentration plant; the plant was located in the Ad Dakhilyah region in the Samail Wilaya in northern Oman. The plant had the capacity to produce 50,000 t/yr of chromium concentrate grading 38% or higher Cr<sub>2</sub>O<sub>3</sub>. The company planned to double the plant's capacity to 180,000 t/yr by the early part of 2013 (Gulf Mining Material Co., 2013).

In 2012, four ferrochrome smelters were at different stages of construction in Freezone Sohar. Muscat Overseas Group, which was the parent company of Al Tamman, and Indsil Group of India were building two ferrochrome smelters that would have the capacity to produce 75,000 t/yr of ferrochrome in the first phase and 150,000 t/yr after the completion of the

second phase. The two Al Tamman Indsil ferrochrome smelters were expected to be completed by the end of 2014. Metkore Alloys & Industries Ltd. of India had started preparation work to build a 165,000-t/yr-capacity ferrochrome smelter at the Freezone Sohar. The \$80 million smelter, which was expected to commence production in 2014, would use chromite mined in Oman, and the smelter's entire output would be exported to India. Gulf Mining Group was also building \$30 million ferrochrome smelter that would have the capacity to produce 50,000 t/yr of ferrochrome (Al Tamman Trading Establishment L.L.C., 2012; Watts, 2012a, b).

**Copper and Gold.**—Mawarid operated the Ghuzayn, the Mandoos, the Safwa, and the 3 Shinas open pit copper mines in Oman. The company held exploration and exploitation permits for Blocks 1 and 2, which are located in northwestern Sohar, and for the Ghuzayn Block. Mawarid completed a feasibility study for the Ghuzayn 1, 2, and 3 prospects where it had previously identified copper mineralization during the exploration phase. The mineral resources at Ghuzayan 1, 2, and 3 were estimated to be about 10 Mt grading between 1.5% and 2.0% copper. Mawarid planned to switch to underground mining at the Ghuzayn Mine after exhausting the copper resources accessible by open pit mining. Mawarid owned and operated a copper concentrator at Lasail, which is located 35 kilometers (km) west of Sohar. The concentrator increased copper content in the mined copper ore to between 18% and 24% from between 2% and 3% and had a throughput of 140 metric tons per hour. Government-owned OMC refined and sold copper concentrates (Mawarid Mining Co. L.L.C., 2012a, b).

OMC finalized the bankable feasibility study (BFS) and environmental application for a copper mine and a copper concentration plant to be built at the Yankul area in Al Dhahira Governorate. The company planned to truck the concentrated copper ore to its smelter in Sohar, which is located 120 km northeast of the proposed mine. OMC expected to produce about 1.8 million metric tons per year (Mt/yr) of copper ore for smelting for 10 years (Oman Mining Co. L.L.C., 2011).

Al Fairuz Mining L.L.C. and Gentor Resources Inc. of Canada were exploring for copper and gold at Block 5 in northern Oman and targeting volcanogenic massive sulfide (VMS) mineralization types similar to the Troodos Massif in Cyprus. Under the agreement signed by the two companies, Gentor would earn 65% interest in Al Fairuz Mining following the completion of a BFS. Based on the results of the BFS, Gentor would have the option to invest capital and offer expertise to mine any copper and gold found in Block 5, and then could recover the cost of exploration, the BFS, and mine development from the revenue. The subsequent earnings would be distributed according to a 65:35 ratio. Gentor had a similar agreement in place with Al Zuhra L.L.C. for the copper-gold exploration in Block 6. Gentor would earn 70% of future earnings and Al Zuhra, 30% (Gentor Resources Inc., 2012b).

In 2012, Gentor estimated the total mineral resources (indicated and inferred) at a cutoff rate of 0.30% copper in the Mahab 4 and Maqail South deposits to be 1.67 Mt, which includes 1.5% copper, 0.1 gram per metric ton (g/t) gold, 2.5 g/t silver, 0.01% lead, and 0.12% zinc (Gentor Resources Inc., 2012a).

Daris Resources L.L.C. was a joint venture of Alara Oman Operations Pty Ltd. (a subsidiary of Alara Resources Ltd. of Australia) and Al Tamman formed to develop and explore for copper and gold in the Daris property (Block 7). The Daris property covers 587 square kilometers (km<sup>2</sup>) and is located in Suwaiyq Wilayat of the Batinah region of Oman. Alara had the right to increase its interest in the project to 70% from 50%. In March, Alara began a 1,000-meter drilling program at the Daris copper-gold project (Alara Resources Ltd., 2012b).

Alara also formed a joint venture with Pilatus Resources Oman L.L.C. to develop the mineral resources of the Washihi-Mullaq-Al Ajal copper-gold project, which is located from about 80 to 160 km east and southeast of the Daris copper-gold project. The project includes three prospects (exploration licenses) that cover an area of about 80 km<sup>2</sup>. Alara's estimated Joint Ore Reserves Committee (JORC)-compliant resources at the Washihi prospect were 6.9 Mt of inferred resources at grades of 0.76% copper and 0.16 g/t gold. Indicated reserves were estimated to be 2.1 Mt at grades of 0.70% copper and 0.17 g/t gold (Alara Resources Ltd., 2012a, b; 2013).

In 2012, Alara estimated the measured and indicated mineral reserves at the Daris-East prospect at a cutoff rate of 0.5% copper to be 240,024 t of sulfide ore containing 2.37% copper and 183,365 t of oxide ore containing 0.72% copper. The inferred resources were estimated to be 30,566 t of sulfide ore (2.25% copper) and 1,712 t of oxide ore (0.61% copper) (Alara Resources Ltd., 2012a, 2013).

Alara formed another joint venture with Al Tamman to explore for copper and gold in Block 8, which was adjacent to Block 7. The Awtad copper-gold project is located about 130 km from Muscat and covers about 497 km<sup>2</sup>. The project area lies in the Samail ophiolite belt in northern Oman that extends for more than 500 km. Alara conducted a scoping study targeting 0.5 Mt/yr throughputs of copper and gold ore at the Awtad project and decided to withdraw from the project because of poor results compared with other projects in Oman (Alara Resources Ltd., 2012a, b; 2013).

**Iron and Steel.**—Jindal Steel and Power Ltd. of India produced DRI and hot-briquetted iron at its Jindal Shaded iron and steel plant located in the Sohar Industrial Estate. The plant had the capacity to produce 1.5 Mt/yr of DRI (Jindal Shaded Iron and Steel, 2013).

Vale Oman Pelletizing Co. L.L.C. (VOPC) (a subsidiary of Vale S.A. of Brazil) commenced production of iron ore pellets for direct-reduction plants from imported iron ore at its two 4.5-Mt/yr-capacity plants in Sohar. The two pelletizing plants and the distribution center were located within the Sohar Industrial Estate. The maritime terminal and distribution center, which was built by VOPC at Sohar Port, had the capacity to handle up to 40 Mt/yr of iron ore and pellets. All iron ore for the pellet plant was shipped from Vale's iron ore mines in Brazil by way of four 400,000-t-capacity ore carriers that were built in China for Oman Shipping Co. (Arab Steel, 2012; Gavin, 2012).

Gulf Specialty Steel Industries, which was a joint venture of Global Steel Industries Pte Ltd. of Singapore and Takamul, proposed to build a steel wire plant in Sohar. The plant would have the capacity to produce 60,000 t/yr of galvanized steel

wire and was expected to commence production by the second quarter of 2013 (Takamul Investment Co. S.A.O.C, 2013a).

**Manganese.**—Al Tamman completed scoping studies, geologic mapping, and a topographic survey for manganese ore concessions in the Al Mintirib, the Al Mudhaybi, the Al Qabil, and the Ja'alan sites in the Al Sharqiya region of Oman. The company had the capacity to produce 60,000 t/yr of manganese ore grading 25% manganese at the Al Qabil open pit mine, which was located 220 km south of Muscat. Al Tamman was in talks with the Indsil Group of India to build a 100,000-t/yr manganese smelter at the Freezone Sohar to beneficiate the manganese produced from the Al Mintirib concession (Prabhu, 2011, 2012; Al Tamman Trading Establishment L.L.C., 2012).

### *Industrial Minerals*

**Gypsum.**—Gypsum resources and reserves were estimated to be about 950 Mt of gypsum in the southern region of Oman, including 165 Mt of minable gypsum in the Shuwaymiyah area. Gypsum production had been increasing during the past 5 years (with the exception of 2009). Oman's output of more than 1.9 Mt of gypsum in 2012 was an increase of 53% compared with that of 2011 and 193% compared with that of 2010. In 2012, Zawawi Minerals L.L.C. entered into a partnership agreement with USG Corp. of the United States to develop a gypsum deposit in southern Oman. USG was expected to invest \$60 million to build the mine and a plant to make plasterboard in the Salalah Free Zone (table 1; Kmoonpuri, 2012; Watts, 2012c).

**Nitrogen.**—OMIFCO and SIUCI produced and exported nitrogen fertilizer in Oman. OMIFCO produced about 1.4 Mt/yr of ammonia and 2.1 Mt/yr of granulated urea at its plant in the Sur Industrial area. OMIFCO's entire output was exported to India under a long-term take-or-pay offtake agreement. SIUCI produced ammonia and urea at its plant located at the Sohar Industrial Estate. The plant's initial production capacity was 1.2 Mt/yr of granular urea. The project, which comprised a 2,000-metric-ton-per-day (t/d)-capacity ammonia production plant and two granular urea plants with a combined capacity of 3,500 t/d, was built by Mitsubishi Heavy Industries Fertilizer Project Contracting and Construction Co. L.L.C. (a subsidiary of Mitsubishi Heavy Industries Ltd. of Japan). The plant used natural gas as a feedstock supplied through an overland pipeline and the Seawater Intake/Outfall Facility at the Sohar Industrial Estate for cooling and desalination (Oman India Fertiliser Co. S.A.O.C, 2013; Suhail Bahwan Group, 2013).

**Sulfur.**—SSF, which was as a joint venture of Takamul (the majority shareholder), Awtad Projects and Development Co. L.L.C., and CoreSulphur Inc. of the United States manufactured sulfur bentonite fertilizer and other micronutrients in Oman. SSF had the capacity to produce 30,000 t/yr of sulfur-bentonite fertilizer at its plant located in the Sohar Industrial Estate. Other products included boron sulfate, copper sulfate, iron sulfate, magnesium sulfate, and zinc sulfate, which are used as micronutrient fertilizers. SSF had an agreement with ORPIC, in which Oman ORPIC supplied 30,000 t/yr of sulfur to SSF (Takamul Investment Co. S.A.O.C, 2013a).

## Mineral Fuels

**Natural Gas and Petroleum.**—Petroleum production had been increasing steadily in the past 5 years in Oman. Much of the increase was attributed to the implantation of comprehensive enhanced oil recovery (EOR) methods for mature oilfields. EOR methods were chosen on a field-by-field basis. In 2012, ORPIC had the capacity to produce 222,000 bbl/d of refined products from the country's two refineries, which were located in Sohar and Mina Al-Fahl. In 2011, ORPIC awarded Chicago Bridge & Iron Co. N.V. of the Netherlands a front-end engineering and design contract for the Sohar refinery expansion project. The project would increase refining capacity to 167,000 bbl/d from 116,000 bbl/d by 2015 and would cost \$40 million to build. The Government planned to build a third refinery at Duqm in southern Oman. The new refinery would be located in the Special Economic Zone at Duqm and would have a capacity of 230,000 bbl/d. The project would be a joint venture of the Government and international investors, and most of the output would be destined for export (U.S. Energy Information Administration, 2012).

## Outlook

Oman's hydrocarbon reserves are estimated to last 16 more years for crude oil and 33 years for natural gas if production continues at current (2012) levels (336.5 million barrels for crude oil and 37.9 billion cubic meters for natural gas). Therefore, the Government has been working on diversifying its economy to reduce dependence on hydrocarbon revenue by developing the country's industrial sector. The mineral industry of Oman is expected to continue to grow in the next 5 years as local, regional, and international companies continue to invest in primary and secondary aluminum, cement, fertilizer, ferrochrome, gypsum, iron and steel, and petrochemical projects in Oman (Spong, 2013, p. 20).

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TABLE 1  
 OMAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	2008	2009	2010	2011	2012
<b>METALS</b>					
Aluminum	49	351	367	373	360
Chromium:					
Ore, gross weight	865	798	865	617	555
Cr <sub>2</sub> O <sub>3</sub> content	302	279	303	216	194
Copper:					
Mine output	78	82	87	111	104
Metal, Cu content	2	2	2	2	2
Smelter output, Cu content	12	16	16 <sup>e</sup>	20	20
Refined, Cu content	12	15	15 <sup>e</sup>	16	16
Gold, metal or Au content kilograms	43	28	27	--	--
Iron and steel:					
Crude steel <sup>e</sup>	84	84	84	160 <sup>r,2</sup>	160
Direct-reduced iron	--	--	--	1,110	1,460
Laterite	359	392	375	722	682
Iron ore, pellets <sup>3</sup>	--	--	--	--	9,000
Manganese	--	--	--	41	38
Silver, metal or Ag content kilograms	9	15	10	--	--
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic	4,000	4,000	4,500	5,000	5,200
Clay	146	148	156	170	101
Gypsum	349	254	653	1,254	1,915
Kaolin	--	9	47	143	140
Limestone	3,845	3,353	4,638	4,995	6,454
Marble	501	631	695	931	1,126
Nitrogen: <sup>e</sup>					
N content of ammonia	1,000 <sup>2</sup>	1,000	1,700 <sup>2</sup>	1,700 <sup>r</sup>	1,700
N content of urea	830 <sup>2</sup>	830	1,500 <sup>2</sup>	1,500 <sup>r</sup>	1,500
Quartz	191	209	187	217	343
Salt	11	31	12	12	13
Sand and gravel	67,600	69,251	70,686	69,391	69,478
Silica sand	29	32	34	38	47
Sulfur <sup>e</sup>	50	50	50	50	50
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Gas, natural:					
Gross million cubic meters	30,230	31,022	33,259	34,716 <sup>r</sup>	37,919
Dry do.	23,975	25,140	27,086	28,591 <sup>r</sup>	31,583
Natural gas liquids thousand 42-gallon barrels	31,974	36,464	38,726	38,508	38,288
Petroleum:					
Crude and condensate do.	276,971	296,600	315,575	325,215	336,530
Refinery products:					
Liquefied petroleum gas do.	3,832	4,125	3,248	3,212	3,980
Gasoline do.	19,126	18,396	16,242	23,250	23,324
Jet fuel and kerosene do.	6,242	5,840	4,599	4,891	5,475
Distillate fuel oil do.	14,746	13,396	11,132	15,804	15,476
Residual fuel oil do.	7,300	5,804	2,263	3,650	3,577
Other do.	27,074	27,479	21,416	26,303	22,448
Total do.	78,320	75,040	58,900	77,110	74,280

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

<sup>1</sup>Table includes data available through February 27, 2014.

<sup>2</sup>Reported figure.

<sup>3</sup>Pellets were produced from imported iron ore for use by direct-reduction plants.

TABLE 2  
OMAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	Sohar Aluminium Co. L.L.C. [Oman Oil Co. S.A.O.C (OOC), 40%; Abu Dhabi Energy Co. P.J.S.C., 40%; Rio Tinto Alcan, 20%]	Smelter at Sohar	360,000.
Cement	Oman Cement Co. S.A.O.C (Government, 51%; Pension Funds, 33.65%; Individual investors, 9.85%; Public Authority of Social Insurance, 5.50%)	Kilns and mills at Rusayl	2,500,000.
Do.	Raysut Cement Co. S.A.O.C (RCC)	Kilns and mills at Salalah	4,700,000.
Do.	Al Madinah Cement Co. L.L.C.	Kilns and mills at Wadi Saa	750,000.
Chromite:			
Ore	Al Tamman Trading Establishment L.L.C.	Al Ram Mine and the Wadi Rajmi Mine	250,000.
Do.	Hatton FZE	Mines south of Muscat	200,000.
Do.	Gulf Mining and Materials Co.	Wadi Mahram area	200,000.
Do.	Oman Chromite Co. S.A.O.G. (Ministry of Commerce and Industry, 15%)	Mines near Sohar	200,000.
Do.	Northern Minerals Co. L.L.C.	Somail	20,000.
Concentrate	Gulf Mining and Materials Co.	Ad Dakhiliyah	50,000.
Clays	NA	NA	185.
Copper:			
Ore	Mawarid Mining L.L.C. (MB Holding Co. L.L.C., 100%)	Open pit mines at Ajib and Shinas	80,000.
Concentrated ore	do.	Lasail, near Sohar	400,000.
Refined metal	Oman Mining Co. L.L.C. (OMC) (Government, 100%)	Sohar Industrial Area	20,000.
Gold:			
Ore	do.	Rakah Gold Mine, Hayl As Safi	500,000.
Refined kilograms	do.	Sohar Industrial Area	500.
Gypsum	Cement Gypsum Products Co. S.A.O.G., Global Mining Co. L.L.C., and Gulf Mining and Materials Co.	Buraimi and Thumriat	180.
Do.	Global Mining Co., L.L.C.	Sohar	65,000.
Iron and steel:			
Iron ore pellets	Vale Oman Pelletizing Co. L.L.C. (Vale S.A., 70%, and Oman Oil Co. S.A.O.C, 30%)	do.	9,000,000.
Iron ore (laterite)	Gulf Mining and Materials Co.	Barka	300,000.
Crude steel	Modern Steel Mills L.L.C. (Oman International Development and Industrial Co. S.A.O.G., Assarain Group of Companies, Dharamsey Group, and others)	Rusayl	16,000.
Direct-reduced iron	Jindal Shadeed Iron and Steel L.L.C. (Jindal Steel and Power Ltd., 100%)	Sohar	1,500,000.
Rolled-steel products (rebar)	Sharq Sohar Steel Rolling Mills L.L.C.	do.	250,000.
Do.	Hadid Majan L.L.C.	Bait Al Falaj	100,000.
Rolled-steel products (tubes)	Al Jazeera Tube Mills Co. S.A.O.G.	Sohar	300,000.
Kaolin	NA	NA	150,000.
Limestone	Oman Cement Co. S.A.O.G. (Ministry of Commerce and Industry, 30.4%)	Rusayl	2,400,000.
Do.	Northern Minerals Co. L.L.C.	Wadi Al Jizzi, Al Batinah	900,000.
Do.	Global Mining Co., L.L.C.	Sohar	NA.
Magnesium	House of Natural Minerals L.L.C.	NA	NA.
Manganese	do.	NA	2,000.
Do.	Al Tamman Trading Establishment L.L.C.	Al Qabil	60,000.
Marble	do.	Buraimi	700,000.
Do.	Companies that quarried marble included Al Ajmi Marble Co., Al Madinah Marble Co., Al Nasser Marble Co., Al Rushaidi Marble Co., Al Shanfri Marble Co., Al Zarabi Marble Co., Gulf Mining Materials Co., International Marble, and Omani Marble Co.	Quarries located primarily in Ibbi Wilayah and the Buraimi area	450,000.

See footnotes at end of table.

TABLE 2—Continued  
OMAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas million cubic meters	Petroleum Development Oman L.L.C. (PDO) [Government, 60%; Royal Dutch Shell plc, 34%; Total S.A., 4%; Partex (Oman) Corp., 2%]	Gasfields and oilfields with associated natural gas in the Kauther/Yibal, the Saih Niyahda, and the Saih Rawl clusters	27,000.
Natural gas, liquefied	Oman Liquefied Natural Gas L.L.C. [Government, 51%; Shell Gas B.V., 30%; Total S.A., 5.54%; Korea LNG, 5%; Mitsubishi Corp., 2.77%; Mitsui E&P Middle East B.V., 2.77%; Partex (Oman) Corp., 2%; Itochu Corp., 0.92%]	Two trains at Qalhat	7,000,000.
Do.	Qalhat Liquefied Natural Gas S.A.O.C (Government, 46.84%; Oman Liquefied Natural Gas L.L.C., 36.8%; Union Fenosa S.A., 7.36%; Mitsubishi Corp., 3%; Oskas Gas Co. Ltd., 3%; Itochu Corp., 3%)	One train at Qalhat	3,400,000.
Nitrogen fertilizer	Oman India Fertiliser Co. S.A.O.G. (OMIFCO) [Oman Oil Co. S.A.O.C (OOC), 50%; Indian Farmers Fertiliser Cooperative Ltd., 25%; Krishak Bharati Cooperative Ltd., 25%]	Sur	923,450 urea.
Do.	Sohar International Urea & Chemical Industries (SIUCI) (SuhailBahwan Group, 100%)	Sohar	1,300,000 urea.
<b>Petroleum:</b>			
Crude barrels per day	Petroleum Development Oman L.L.C. (PDO) [Government, 60%; Royal Dutch Shell plc, 34%; Total S.A., 4%; Partex (Oman) Corp., 2%]	About 100 oilfields in the Bahja, the Fahud, the Harweel, the Lekhwair, the Marmul, the Nimr, the Qarn Alam, and the Yibal clusters	900,000.
Do.	do. Oxy Oman, Inc (Occidental Petroleum Corp., 65%, and Mitsui E&P Middle East B.V., 35%)	Blocks 9 and 27, includes the Safah and Al Sunienah fields	55,000.
Do.	do. Daleel Petroleum Co. L.L.C. (Mazoon Petrogas S.A.O.C, 50%, and Mazoon Petrogas B.V.I., 50%)	Block 5, includes the Bushra, the Daleel, the Mezoon, and the Shadi fields	16,000.
Do.	do. Occidental Mukhaizna, L.L.C. [Occidental Petroleum Corp., 45%; Oman Oil Co. S.A.O.C, 20%; Shell Oman Trading Co. Ltd., 17%; Liwa Energy Ltd., 15%; Total Exploration and Production Oman, 2%; Partex (Oman) Corp., 1%]	Block 53, Mukhaizna field	8,500.
Do.	do. Partnership of LG International Corp., 50%; Indago Oman Ltd., 40% (operator); Eagle Energy (Oman) Ltd., 10%	Block 8, Bukha field	1,100.
Refined thousand barrels per day	Oman Refineries and Petrochemicals Co. L.L.C. (ORPC) (Ministry of Finance, 75%, and Oman Oil Co. S.A.O.C, 25%)	Refinery at Sohar	116.
Do.	do.	Refinery at Mina Al-Fahal	106.
Quartz	Gulf Stone Co. S.A.O.G.	Sohar	180.
Salt, crude, industrial	Modern Salt Co. L.L.C.	Ibri Wilayat	10.
Sand	NA	NA	20.
Silver kilograms	Oman Mining Co. L.L.C.	Sohar and Yankul	50.
<b>Sulfur:</b>			
Elemental	Oman Oil Refineries and Petroleum Industries (ORPIC)	Refinery at Sohar	50,000.
Fertilizer	Sohar Sulphur Fertilizers L.L.C. (SSF)	Sohar Industrial Estate	30,000.

Do., do. Ditto. NA Not available.