



# 2015 Minerals Yearbook

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**MEXICO [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF MEXICO

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In 2015, Mexico was estimated to be the world's leading producer of silver, by tonnage, accounting for 21% of the world's production. The country also ranked second among the world's leading producers of fluor spar (accounting for 15% of world production); third among the world's leading producers of bismuth (7% of world production) and wollastonite (8% of world production, excluding the United States); fifth among the world's leading producers of cadmium (6% of world production, excluding the United States); and sixth among the world's leading producers of zinc (5% of world production). Mexico's real gross domestic product (GDP) increased by 2.5% in 2015 compared with that of 2014. The country's mineral sector accounted for 7% of the total GDP, and the petroleum sector accounted for 5% (Secretaría de Economía, 2016d, p. 8; Anderson, 2017; Bennett, 2017; Flanagan, 2017; McRae, 2017; Tolcin, 2017a, b).

According to the U.S. Energy Information Administration, Mexico was one of the leading petroleum producers in the world and the fourth-ranked producer in the Americas, after the United States, Canada, and Brazil. In recent years, the country's petroleum production had been decreasing as a result of natural production declines from the Cantarell field and other large offshore fields. At yearend 2013, in an effort to address the decreases in petroleum production, the Government had enacted constitutional reforms that ended state-owned *Petróleos Mexicanos S.A. de C.V.'s* (PEMEX's) monopoly on petroleum and natural gas production and opened the industry to foreign investment. As part of the reforms, in 2015, the country began its first round of auctions (Round One), which offered private investors the opportunity to bid for the exploration and production rights to 14 offshore blocks. The country continued to be a significant crude petroleum exporter; its leading trading partner was the United States, which was the destination for most of Mexico's crude petroleum exports (U.S. Energy Information Administration, 2015).

## Minerals in the National Economy

In 2015, mineral and metal processing accounted 3% of the country's total GDP. The production value of the mineral and metal-processing sector increased by 10% in 2015 compared with that of 2014. Of the total mineral and metal-processing production, gold accounted for a 32.2% share, by value, followed by copper (19.3%), silver (18.8%), zinc (6.8%), iron pellets (4.7%), coke (4.1%), coal (2.8%), lead (2.7%), molybdenum (1.4%), salt (1.3%), and other minerals (5.9%). As of September, a total of 25,329 mining concessions were registered, which accounted for about 12% of the country's territory. The States of Chihuahua, Coahuila, Durango, Jalisco, Sonora, and Zacatecas accounted for about 67% of the registered mining concessions. In 2015, employment in the mineral and metal-processing sector increased by 1.2% to 344,912 workers from 340,817 workers in 2014 and accounted

for about 2.0% of the total workforce in the country. The State of Nuevo Leon accounted for 15% of the total employment in the mineral and metal-processing sector, followed by the States of Coahuila (11%), Mexico (9%), and Chihuahua, Guanajuato, and Sonora (5% each) (Secretaría de Economía, 2016d, p. 24, 32–34; 2016e, p. 13, 16).

Investments in the mineral and metal-processing sector totaled \$5.5 billion in 2015 compared with \$4.9 billion in 2014. Of the \$5.5 billion, investments in new projects accounted for 28%; exploration, for 12%; and expansion projects, for 8%. According to the Secretaría de Economía [Ministry of the Economy], a total of 267 companies with foreign capital were involved in 927 projects in Mexico in 2015. Of these companies, 173 had their central offices in Canada; 44, in the United States; 13, in China; 7, in Australia; 5, in Japan; 4 each, in the Republic of Korea and the United Kingdom; 3, in Spain; 2 each, in Chile, France, and India; and 1 each, in Belgium, Brazil, Italy, Ireland, Luxembourg, Peru, the Philippines, and Switzerland. Of the 927 projects in the country, about 68% were in the exploration stage, 4% were in the development stage, 11% were in the production stage, and 17% had been postponed or were on hold. Precious metals, particularly gold and silver, were the primary targets for 595 of the projects, and polymetallic projects numbered 131. Copper and iron ore accounted for 119 and 51 projects, respectively, and the remaining projects involved other mineral commodities. The State of Sonora accounted for 24% of the total projects that had received foreign capital, followed by Chihuahua (13%), Durango and Sinaloa (11% each), Zacatecas (8%), and Jalisco (7%) (Secretaría de Economía, 2016a, p. 2–6; 2016d, p. 26, 28–30; 2016e, p. 43–44).

## Government Policies and Programs

The mineral sector is administered by the Ministry of the Economy. The *Dirección General de Regulación Minera* [General Department of Mining Regulation], which is part of the Ministry of the Economy, is the organization in charge of making revisions to the mining law and its regulations, as well as granting concessions and titles. The *Servicio Geológico Mexicano* [Mexican Geological Survey], which is part of the Ministry of the Economy, is responsible for generating and providing knowledge for territory planning and for facilitating mining of the country's natural resources. Mineral commodities are considered to be part of the national patrimony of Mexico under its Constitution. Article 27 deals with issues of ownership and mining of natural resources; the *Ley Minera* [Mining Law] became effective in 1992 and was subsequently modified and expanded in 1996 and again in April 2005, in June 2006, and on August 11, 2014. The Mining Law clarifies and spells out the legal framework for the exploration, production, and processing of the country's mineral resources. Neither petroleum and its derivatives nor radioactive materials are covered by this law. Under the Mining Law, mining concessions can be granted

only by the Ministry of the Economy. Exploration concessions are granted for 6 years and are not renewable. Production concessions are awarded for 50 years and are renewable for an additional 50 years. The Reglamento de la Ley Minera [Rules of the Mining Law], which was published in the Diario Oficial of the Mexican Congress in 2012, was modified in October 2014. The Reglamento de la Ley Minera regulates the granting and the administration of mining concessions and how the rights and obligations derived therefrom are exercised and fulfilled (Cámara de Diputados del H. Congreso de la Unión, 2014c, p. 1, 3, 11, 27; 2014d, p. 1).

Mexico's energy sector is regulated by the Secretaría de Energía [Ministry of Energy] and the Comisión Nacional de Hidrocarburos [National Hydrocarbons Commission]. As previously mentioned, at yearend 2013, the Government enacted constitutional reforms ending the PEMEX monopoly and opening the energy sector to foreign investment. On August 11, 2014, new hydrocarbons laws were published in the Diario Oficial of the Mexican Congress. Under the laws, all hydrocarbons remain the property of the Mexican Government. The law establishes that the Ministry of Energy, with technical assistance from the National Hydrocarbons Commission, is responsible for awarding allocations to PEMEX or any other state-owned company to explore for and to extract hydrocarbons. The reforms also allow for new exploration and production contract models, such as licenses and production-sharing, profit-sharing, and service contracts. As stipulated in the new hydrocarbons laws, PEMEX is allowed first refusal on developing the country's resources before private companies begin bidding, which is known as Round Zero. Round Zero is intended to reach a balance between the resources that PEMEX operates and those that the state manages and grants to the private sector by auction (Cámara de Diputados del H. Congreso de la Unión, 2014a, p. 1, 4, 8; Secretaría de Energía, 2014b, p. 3–4; U.S. Energy Information Administration, 2015).

The Foreign Investment Law was published in 1993 and amended most recently in 2014. The law regulates the degree and form of foreign investment in Mexico. Under the law, foreign investors seeking to obtain concessions for exploration and mining within the country, shall first submit to the Secretaría de Relaciones Exteriores [Ministry of Foreign Affairs] a statement agreeing to the terms of Article 27 and then obtain the corresponding permit from the Ministry of the Economy. The law also establishes that foreign investors may hold 100% of the capital stock of any Mexican corporation or partnership, except in those few areas expressly subject to limitations under the law (Cámara de Diputados del H. Congreso de la Unión, 2014b, p. 7; U.S. Department of State, 2015).

## Production

In 2015, production of strontium minerals increased by 22% to 79,022 metric tons (t) from 64,931 t in 2014, and that of sodium compounds increased by 15% to 732,600 t from 637,141 t in 2014. Decreases in the production of metals included bismuth (by 37%); iron ore (gross weight and iron content) (19% each); molybdenum (15%); and pig iron (11%). Decreases in the production of industrial minerals included barite (by 37%), quartz (silica) (32%), and salt (11%).

Decreases in the production of mineral fuels included that of lubricants (by 38%), asphalt (26%), liquefied petroleum gas (19%), natural gas liquids (11%), and jet fuel and motor gasoline (10% each). Data on mineral production are in table 1.

## Structure of the Mineral Industry

Mexico's leading silver producers included Fresnillo plc., Goldcorp Inc. of Canada, Grupo Mexico S.A.B. de C.V., Industrias Peñoles, S.A.B. de C.V., and Pan American Silver Corp. of Canada. Industrias Peñoles, through its subsidiary Metalúrgica Met-Mex Peñoles S.A.B. de C.V., was the leading producer of bismuth in the country. The refinery, which was located in Torreon in the State of Coahuila, had the capacity to produce 1,440 metric tons per year (t/yr) of bismuth. Exportadora de Sal, S.A. de C.V., which was a joint venture between the Government (51% interest) and Mitsubishi Corp. of Japan (49%), was the leading producer of salt in the country. Exportadora de Sal was located in Guerrero Negro in the State of Baja California Sur and had the capacity to produce about 9.5 million metric tons per year (Mt/yr) of salt. Minera Roca Rodando, S. de R.L. de C.V. (a subsidiary of S&B Industrial Minerals S.A. of the United States) owned the Pilares Mine, which was the only mine in the country that produced wollastonite. Pilares is located in Hermosillo, State of Sonora. Mexichem, S.A.B de C.V., through its wholly owned subsidiaries Fluorita de México, S.A. de C.V. and Mexichem Fluor, S.A. de C.V., was the leading producer of fluorspar in the country. Fluorita de México operated La Sabina Mine, which is located in the State of Coahuila and had the capacity to produce about 100,000 t/yr, and Mexichem Fluor operated Las Cuevas Mine, which is located in the State of San Luis de Potosí and had the capacity to produce about 1.2 Mt/yr. Table 2 is a list of major mineral industry facilities.

At yearend 2015, PEMEX, through its subsidiary PEMEX Fertilizantes, announced the acquisition of the Grupo Fertinal S.A. de C.V. at a cost of \$680 million. Grupo Fertinal, through its subsidiary Roca Fosfórica de México S.A. de C.V., was the leading phosphate rock producer in the country; it produced phosphate rock from its mine located at San Juan de la Costa in the State of Baja California Sur (Ibarra, 2015).

## Mineral Trade

The total value of Mexico's exports was about \$380.8 billion in 2015 compared with about \$397.1 billion in 2014. The country's major export trade partner was the United States, which received 81% of Mexico's exports. The total value of Mexico's imports in 2015 was about \$395.2 billion compared with about \$400.0 billion in 2014. Its major import partners were, in descending order of value, the United States, which supplied 47% of Mexico's imports, and China (18%) (Secretaría de Economía, 2016b, c).

Mineral and metal-processing exports decreased by about 15% to \$14.6 billion from \$17.1 billion in 2014. The decrease in exports was attributed to a 15% decrease in exports of metallic minerals, which accounted for 92% of the total mineral and metal-processing exports in 2015. Gold accounted for about 30% of the mineral and metal-processing exports, followed

by copper (17%), silver (16%), lead (11%), zinc (7%), and iron ore (4%). The leading mineral and metal-processing export partners were, in order of export value, the United States (which received about 52% of the country's mineral and metal-processing exports), China (11%), and the Republic of Korea and Switzerland (7% each). Mineral and metal-processing imports decreased by 5% to \$8.1 billion from \$8.6 billion in 2014. Aluminum accounted for 32% of the mineral and metal-processing imports, followed by iron ore (13%), copper (10%), and coal (8%). The leading mineral and metal-processing import partners were, in order of import value, the United States (which supplied about 51% of the country's mineral and metal-processing imports), Canada (9%), India (6%), and China and Russia (5% each) (Secretaría de Economía, 2016d, p. 37–45).

In 2015, Mexico's exports to the United States were valued at about \$296.4 billion, which was about the same amount as in 2014. Crude petroleum accounted for \$12.5 billion worth of exports; nonmonetary gold, about \$2.9 billion; fuel oil, about \$755.4 million; and petroleum products, about \$379.5 million. Imports from the United States were valued at \$235.7 billion in 2015 compared with \$240.3 billion in 2014; these included more than \$11.7 billion in petroleum products; \$4.1 billion in fuel oil; \$2.2 billion in natural gas; and \$848.9 million in natural gas liquids (U.S. Census Bureau, 2016a, b).

## Commodity Review

### Metals

**Copper.**—Grupo México continued with its \$3.5 billion investment program at Buenavista del Cobre; after the completion of the program, the company expected to increase its copper production capacity by 180%, and its molybdenum production capacity by 42%. During the year, Buenavista de Cobre's new copper and molybdenum concentrator plant began operations (operating at 90% of capacity). The plant had the capacity to produce 188,000 t/yr of copper content and 2,600 t/yr of molybdenum and was expected to reach full capacity in the second quarter of 2016. The investment program also included the ESDE III plant, which had the capacity to produce about 120,000 t/yr of copper cathode and was expected to be producing at full capacity in the first quarter of 2016, and a crushing and conveying system (Quebalix IV), which would have a crushing capacity of 80 Mt/yr of leachable ore and was expected to be completed in the second quarter of 2016. Grupo México expected production at Buenavista del Cobre to be 460,000 t by 2016 and 500,000 t by 2017 (Grupo Mexico S.A.B. de C.V., 2016, p. 2, 8).

In January, Minera y Metalúrgica El Boleo S.A.P.I. de C.V. (MMB) began production at its Boleo copper-cobalt-zinc-manganese project, which is located in Santa Rosalia in the State of Baja California Sur. Boleo had an estimated mine life of at least 22 years and the capacity to produce about 51,000 t/yr of copper cathode, 25,000 t/yr of zinc sulfate, and 1,700 t/yr of metallic cobalt (99.9% pure). MMB was a joint venture between Korea Resources Corp. (90% interest) and Baja Mining Corp. of Canada (10%) (Minera y Metalúrgica El Boleo S.A. P. I. de C.V., 2015).

**Gold.**—Goldcorp Inc. of Canada held 100% interest in the Peñasquito Mine through its subsidiary Minera Peñasquito S.A. de C.V., and Los Filos Mine, through its subsidiary Desarrollos Mineros San Luis S.A. de C.V. In 2015, gold production from Peñasquito, which is located in the State of Zacatecas, increased by 52% to 26,758 kilograms (kg) from 17,660 kg in 2014. The company attributed the increase to higher gold ore grades in Phase 5C. Gold production at Peñasquito was expected to decrease to between 16,200 kg and 18,000 kg in 2016 owing to mining a lower grade portion of the Peñasco pit. As of December 31, total proven and probable mineral reserves at Peñasquito were reported as 587 million metric tons (Mt) at average grades of 30.04 grams per metric ton (g/t) silver and 0.52 g/t gold. Los Filos, which is located in the State of Guerrero, produced 8,848 kg of gold in 2015 compared with 8,046 kg in 2014. As of December 31, total proven and probable mineral reserves at Los Filos were reported as 41 Mt at an average grade of 1.12 g/t gold (Goldcorp Inc., 2016a, p. 4, 62, 65; 2016b, c).

Industrias Peñoles, through its subsidiary Fresnillo, owned a 75% interest in the Cienega, the Fresnillo, the Herradura, the Noche Buena, the Saucito, and the Soledad-Dipolos gold mines. In 2015, Herradura accounted for 52% of the total gold produced by the company. Operations at the Soledad-Dipolos Mine remained suspended. Gold production at Herradura increased by 50% to 12,406 kg in 2015 from 8,260 kg in 2014. The increase was attributed to the rampup of production at the mine after operations were temporarily halted owing to the suspension of the company's explosives permits, and the startup of Herradura's dynamic leaching plant, which resulted in an increase in the quantity of ore processed and higher ore grades. The company continued exploration work at Centauro Deep, which is located below Centauro's main pit at Herradura (Fresnillo plc, 2016, p. 3, 56).

Torex Gold Resources Inc. of Canada began production at El Limón-Guajes (ELG) Mine in December and expected commercial production in the second quarter of 2016. ELG is located about 200 kilometers southwest of Mexico City in the State of Guerrero and included El Limón, the Guajes, and the Media Luna deposits. The mine had an estimated mine life of about 10 years and the capacity to produce an average of 10,200 kilograms per year (kg/yr) of gold. Total measured and indicated mineral resources at ELG were reported as 48.4 Mt at average grades of 4.4 g/t silver and 2.65 g/t gold, and inferred mineral resources were reported as 6.0 Mt at average grades of 3.15 g/t silver and 1.86 g/t gold. Total proven and probable reserves were also reported as 43.1 Mt at average grades of 3.93 g/t silver and 2.62 g/t gold (Torex Gold Resources Inc., 2016a; 2016b, p. 2).

**Iron and Steel.**—Leading iron ore producers in Mexico included ArcelorMittal Holdings AG of Luxembourg, Altos Hornos de Mexico S.A.B. de C.V. (a subsidiary of Grupo Acerero del Norte, S.A. de C.V.), and Consorcio Minero Benito Juárez Peña Colorada S.A. de C.V. In 2015, Mexico was ranked 13th among the world's leading producers of crude steel and 2d among Latin America's leading producers. According to the Cámara Nacional de la Industria de Hierro y del Acero, steel accounted for 1.9% of the country's total GDP in 2015 and employed about 112,000 workers. The country had an

installed capacity of 29.2 Mt/yr of crude steel and produced 18.2 Mt in 2015. The State of Coahuila was ranked first among the country's crude-steel-producing States, accounting for about 29% of the tonnage produced, followed by the States of Michoacan (18%), Nuevo Leon (16%), Guanajuato (11%), Veracruz (7%), and San Luis Potosi (6%). In 2015, the country exported 4.3 Mt of crude steel and imported 13.7 Mt (Cámara Nacional de la Industria de Hierro y del Acero, 2016, p. 3, 6, 8–11; World Steel Association, 2016, p. 9).

**Lead and Zinc.**—According to Industrias Peñoles, which was one of Mexico's leading producers of lead and zinc, the Velardeña Mine (located in the State of Durango) accounted for about 30% of the company's zinc production and 4% of the company's lead production. In 2015, Velardeñas's production of lead and zinc decreased by 24% and 4%, respectively. The company attributed the decrease in production to lower ore grades. As of December, proven and probable mineral reserves at Velardeña were reported as 31.3 Mt at average grades of 23.2 g/t silver, 0.18 g/t gold, 3.86% zinc, 0.38% lead, and 0.21% copper. The Saucito Mine accounted for about 28% and 8% of Industrias Peñoles's lead and zinc production, respectively. In 2015, production of lead and zinc at the Saucito Mine increased by 108% and 100%, respectively, which was attributed to the rampup of Saucito II (Fresnillo plc, 2016, p. 52; Industrias Peñoles, S.A.B. de C.V., 2016, p. 2, 27, 29, 42).

**Silver.**—Fresnillo produced silver from the Saucito Mine, which accounted for about 47% of the company's total silver production, followed by the Fresnillo Mine (33%) and the Ciénega Mine (10%). In 2015, production of gold and silver at Saucito increased by 48% and 43%, respectively. The increase in production was mainly attributed to the rampup of the Saucito II expansion project, which included an underground mine and a beneficiation plant. As of December 31, measured and indicated mineral resources at Saucito were reported as 14.61 Mt at average grades of 334 g/t silver, 1.93 g/t gold, 3.07% zinc, and 1.57% lead, and inferred mineral resources were reported as 26.49 Mt at average grades of 255 g/t silver, 1.05 g/t gold, 1.68% zinc, and 0.95 % lead. Proven and probable reserves were reported as 12.98 Mt at average grades of 313 g/t silver, 1.75 g/t gold, 2.93% zinc, and 1.49% lead. The Fresnillo underground mine, which was one of the world's oldest continuously operating mines, began operation in 1554. In 2015, silver production decreased by 22%, which was mainly attributed to lower ore grades resulting from limited access to higher ore grades and development delays. Measured and indicated mineral resources at the Fresnillo Mine were estimated to be 33.30 Mt at average grades of 397 g/t silver, 0.85 g/t gold, 3.34% zinc, and 1.67% lead, and inferred mineral resources were reported as 31.38 Mt at average grades of 319 g/t silver, 0.70 g/t gold, 2.45% zinc, and 1.24 % lead. Proven and probable reserves were reported as 21.17 Mt at average grades of 296 g/t silver, 0.77 g/t gold, 3.53% zinc, and 1.75% lead. The company also continued with the development of its 100%-owned San Julián silver-gold project, which is located in the San Julian District on the border between the States of Chihuahua and Durango. The company expected the commissioning of the San Julián leaching plant (phase 1) in the second quarter of 2016 and the flotation plant (phase 2) in the fourth quarter of 2016. Once at

full capacity, San Julián was expected to produce an average of 320,000 kg/yr of silver and 1,370 kg/yr of gold (Fresnillo plc, 2016, p. 1, 3, 15, 20, 50, 52, 225 229).

In April, GoGold Resources Inc. (GoGold) of Canada began commercial production at the Parral tailings project, which is located in Hidalgo del Parral in the State of Chihuahua. The project covers an area of 141 hectares and hosted 21.3 Mt of tailings left over from 340 years of mining operations. As of 2013, proven and probable mineral reserves at Parral were estimated to be 20.4 Mt at average grades of 38.4 g/t silver and 0.31 g/t gold. The company reported that Parral was expected to produce an average annual production of about 34,000 kg of silver and 310 kg of gold. During the year, the company reported that silver and gold production was 30,397 kg and 71 kg, respectively (MDM Engineering Projects Ltd., 2013, p. 27; GoGold Resources Inc., 2015, 2016).

In November, Golden Minerals Co. of the United States suspended mining and sulfide-processing operations at its Velardeña properties, which included two underground mines (Velardeña and Chicago) and two processing plants. The suspension was mainly attributed to low silver and gold prices and lower average mill feed grades and gold recoveries than planned. The Velardeña properties are located within the Velardeña mining district in the State of Durango. The Velardeña Mine includes five major vein systems—Roca Negra, San Juanes, San Mateo, Santa Juana, and Terneras. During the year, the company mined from the Roca Negra, San Mateo, Santa Juana, and Terneras vein systems to increase grades as mining and processing rates ramped up. The company reported that most of the silver and gold was contained in the lead concentrate, and that all its mined material was processed through the sulfide plant (Golden Minerals Co., 2015, 2016).

Chesapeake Gold Corp. of Canada continued with the development of its 100%-owned Metates gold-silver-zinc project, which is located in the State of Durango and comprised 14 mineral concessions totaling 14,727 hectares. During the year, the company updated its prefeasibility study, and total proven and probable mineral reserves were reported as 1,100 Mt at average grades of 14.2 g/t silver, 0.516 g/t gold, and 0.164% zinc. Chesapeake Gold reported that the project had the potential to have an average annual production of about 458,000 kg of silver, 4,100 kg of gold, and 22,100 t of zinc in the first phase of the project (1 to 4 years). The company also reported that active mining was planned for 27 years followed by 10 years of processing stockpiled low-grade ore. No further information about when the development might take place was available (Chesapeake Gold Corp., 2016, p. 2–4).

### *Industrial Minerals*

**Cement.**—Elementia, S.A. de C.V., through its subsidiary Cementos Fortaleza S.A. de C.V., signed a contract with Fives Group of France to expand its Tula cement plant, which is located in the State of Hidalgo. The expansion would increase the company's cement production capacity to 3.5 Mt/yr from 2.0 Mt/yr and was expected to be completed by 2017 (Elementia, S.A. de C.V., 2015, p. 1).

**Sodium Sulfate.**—Industrias Peñoles, through its subsidiary Industrias Magnelec, S.A. de C.V., was the sole producer of

sodium sulfate in the country. In 2015, the company produced 732,600 t of sodium sulfate compared with 637,100 in 2014. The increase in production was attributed to the new plant (Planta II) within Química del Rey, which is located in Laguna del Rey in the State of Coahuila. The new plant had the capacity to produce about 150,000 t/yr of sodium sulfate, which increased Química del Rey's total capacity to 780,000 t/yr. The company reported that, with the recent expansion, the company would be able to meet domestic demand (Industrias Peñoles, S.A.B. de C.V., 2016, p. 11–12, 86).

### **Mineral Fuels**

**Crude Petroleum and Natural Gas.**—According to PEMEX, as of January, proved crude petroleum reserves were estimated to be about 9.7 billion barrels (Gbbbl), of which 62% consisted of heavy oil; 29%, light oil; and 9%, extra-light oil. About 72% of the proved crude petroleum reserves were located in offshore fields and the remaining 28% were located onshore. Proved natural gas reserves were estimated to be about 433 billion cubic meters (reported as 15,291 billion cubic feet), of which 65% consisted of associated gas and the remaining 35% was nonassociated gas. About 56% of the proved natural gas reserves were located onshore and about 44% were located offshore (Petróleos Mexicanos S.A. de C.V., 2015, p. 3–4).

PEMEX reported that it had produced an average of 2,267,000 barrels per day (bbl/d) of crude petroleum in 2015 compared with 2,429,000 bbl/d in 2014. Of the 2,267,000 bbl/d produced in 2015, 51% consisted of heavy crude oil; 37%, light crude oil; and 12%, extra-light crude oil. The Marine region accounted for 77% of the total production, followed by the Southern region, which accounted for 17%, and the Northern region, which accounted for 5%. The company reported that the decrease in crude petroleum production was mostly attributable to a decrease in the production of heavy crude oil (9%), mainly at the Cantarell field; the decrease in extra-light crude oil (8%), to decreased production mainly at the Pijije and Sen y Terra fields; and the decrease in light crude oil (3%), to decreased production at the Cantarell, the Bellota-Jujo, and the Litoral de Tabasco fields. In 2015, the company's exports of crude petroleum amounted to 1,172,000 bbl/d valued at \$18.5 billion compared with 1,142,000 bbl/d valued at \$35.6 billion in 2014 (Petróleos Mexicanos S.A. de C.V., 2016a, b).

In 2013, in an effort to address the decreases in petroleum production, the Government enacted constitutional reforms that ended the 75-year monopoly of PEMEX and opened the industry to foreign investment. In 2014, the Ministry of Energy announced an estimate of the areas that would be offered as part of the Round One process, which included onshore conventional fields, shallow waters, fields rich in extra-heavy oil, and the Chicontepec fields, as well as areas with conventional and unconventional prospective resources. About 169 blocks (109 for exploration and 60 for production) would be offered from 2015 to 2018; the blocks covered an area of about 28,500 square kilometers (km<sup>2</sup>) and represented an annual investment of about \$8.5 million. Total prospective resources amounted to 14.6 Gbbbl of oil equivalent and proven and probable reserves amounted to 3.9 Gbbbl of oil equivalent. In July, the first auction phase of Round One offered 14 offshore blocks for exploration and

production rights to private investors; only 2 blocks of the 14 blocks received adequate bids to be awarded. The consortium of Sierra Oil & Gas S. de R.L. de C.V., Talos Energy LLC of the United States, and Premier Oil PLC of the United Kingdom was awarded Blocks 2 and 7, which are located in the southeastern basin and covered an area of about 194 km<sup>2</sup> and about 465 km<sup>2</sup>, respectively. Talos Energy was the operator and held 45% interest in the two blocks. Sierra Oil & Gas and Premier Oil held the remaining 45% and 10% interest, respectively (Secretaría de Energía, 2014a, p. 1–2, 4, 10; Comisión Nacional de Hidrocarburos 2015d; Premier Oil PLC, 2015; Talos Energy LLC, 2015; U.S. Energy Information Administration, 2015).

In October, the National Hydrocarbons Commission announced the results of its second auction phase of Round One, which included five areas located in the shallow waters of the Gulf of Mexico in the southeastern basin. Eni International B.V. of Italy was awarded Area 1, which included the Amoca, the Mizton, and the Tecoalli fields. The fields had estimated proven and probable reserves of 107 million barrels (Mbbbl) of light crude and 2.0 billion cubic meters of natural gas and cover an area of about 67 km<sup>2</sup>; the hydrocarbons occur in Pliocene sands beneath 33 meters (m) of water. The consortium of Pan American Energy LLC of Argentina and E&P Hidrocarburos y Servicios S.A. de C.V. was awarded Area 2, which included the Hokchi field and covers an area of 40 km<sup>2</sup>. Hokchi had estimated proven and probable reserves of 61 Mbbbl of light crude and 820 million cubic meters of natural gas found in Tertiary sands beneath 28 m of water. Also, the consortium of Fieldwood Energy LLC of the United States and Petrobal, S.A.P.I. de C.V., was awarded Area 4 (the Ichalkil and the Pokoch fields), which covers an area of 58 km<sup>2</sup> and had estimated proven and probable reserves of 68 Mbbbl of light crude and 2.6 billion cubic meters of natural gas found in Cretaceous and Jurassic limestone beneath 45 m of water (Comisión Nacional de Hidrocarburos 2015a–c, e).

In December, the National Hydrocarbons Commission awarded 25 onshore exploration fields in its third auction phase of Round One. The awarded companies were Compañía Petrolera Perseus, S.A. de C.V. (Fortuna Nacional and Tajón fields); Consorcio Manufacturero Mexicano, S.A. de C.V. (Calibrador and Mareógrafo fields); Construcciones y Servicios Industriales Globales, S.A. de C.V. (Duna field); Diavaz Offshore, S.A.P.I. de C.V. (Barcodón and Catedral fields); Grupo Diarqco, S.A. de C.V. (Calicanto and Mayacaste fields); Renaissance Oil Corp. S.A. de C.V. of Canada (Malva, Mundo Nuevo and Topén fields); Sarreal, S.A. de C.V. (San Bernardo field); Servicios de Extracción Petrolera Lifting de México, S.A. de C.V. (Cuichapa-Poniente field); Strata Campos Maduros, S.A.P.I. de C.V. (Carretas, Peña Blanca, and Ricos fields); the consortium of Canamex Dutch B.V. of the Netherlands, Perfolat de México, S.A. de C.V., and American Oil Tools S. de R.L. de C.V. (Moloacán field); the consortium of Geo Estratos, S.A. de C.V., and Geo Estratos Mxoil Exploración y Producción, S.A.P.I. de C.V. (La Laja, Paso de Oro, Pontón and Tecolutla fields); the consortium of Grupo R Exploración y Producción, S.A. de C.V., and Constructora y Arrendadora México, S.A. de C.V. (Secadero field); the consortium of Roma Energy Holdings, LLC of the United States,

Tubular Technology, S.A. de C.V., and Gx Geoscience Corp., S. de R.L. de C.V. (Paraiso field); the consortium of Sistemas Integrales de Compresión, S.A. de C.V., Nuvoil, S.A. de C.V., and Constructora Marusa, S.A. de C.V. (Benavides-Primavera field) (Comisión Nacional de Hidrocarburos, 2015f).

## Outlook

Mexico's economy is expected to continue to grow at a moderate pace and to show an increase in real GDP of 2.4% in 2016, although continued decreases in domestic petroleum production would likely hinder economic growth. The United States is likely to continue to be Mexico's principal commercial partner in 2016. Production of metals will likely continue to be the most dynamic and profitable part of the mineral industry. Canada and the United States will continue to have major involvement in the country's mining projects, which have received direct foreign investments. Copper, gold, lead, silver, and zinc are likely to be the leading mineral exports in 2016, and aluminum, coal, copper, and iron ore are likely to be the leading mineral imports. PEMEX was expected to decrease crude petroleum production by 100,000 bbl/d in 2016 and to reduce investments in upstream operations owing to the decrease in global prices of petroleum. The opening of the petroleum and natural gas sector to foreign investment is likely to increase the production of oil and gas in the medium term and to increase private participation in the sector (Harrup, 2016; International Monetary Fund, 2016, p. 38).

## References Cited

- Anderson, C.S., 2017, Bismuth: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 36–37.
- Bennett, S.M., 2017, Silver: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 152–153.
- Cámara de Diputados del H. Congreso de la Unión. 2014a, Ley de hidrocarburos [Hydrocarbons law]: Mexico City, Mexico, Cámara de Diputados del H. Congreso de la Unión, 71 p. (Accessed June 9, 2016, at [http://www.diputados.gob.mx/LeyesBiblio/pdf/LHidro\\_110814.pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/LHidro_110814.pdf))
- Cámara de Diputados del H. Congreso de la Unión, 2014b, Ley de inversión extranjera [Foreign investment law]: Mexico City, Mexico, Cámara de Diputados del H. Congreso de la Unión, 53 p.
- Cámara de Diputados del H. Congreso de la Unión. 2014c, Ley minera [Mineral law]: Mexico City, Mexico, Cámara de Diputados del H. Congreso de la Unión, 34 p. (Accessed June 9, 2016, at [http://www.diputados.gob.mx/LeyesBiblio/pdf/151\\_110814.pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/151_110814.pdf))
- Cámara de Diputados del H. Congreso de la Unión. 2014d, Reglamento de la ley minera [Regulations of the mineral law]: Mexico City, Mexico, Cámara de Diputados del H. Congreso de la Unión, 51 p. (Accessed June 9, 2015, at [http://www.diputados.gob.mx/LeyesBiblio/regley/Reg\\_LMin\\_311014.pdf](http://www.diputados.gob.mx/LeyesBiblio/regley/Reg_LMin_311014.pdf))
- Cámara Nacional de la Industria de Hierro y del Acero, 2016, Infografía del industria del hierro y del acero en México [Infographic of the iron and steel industry in Mexico]: Federal District, Mexico, Cámara Nacional de la Industria de Hierro y del Acero, 15 p. (Accessed June 2, 2016, at [http://www.canacero.org.mx/en/assets/infografia\\_de\\_la\\_industria\\_del\\_acero\\_en-mexico\\_2016.pdf](http://www.canacero.org.mx/en/assets/infografia_de_la_industria_del_acero_en-mexico_2016.pdf))
- Chesapeake Gold Corp., 2016, Management's discussion and analysis—Year ended December 31, 2015: Vancouver, British Columbia, Canada, Chesapeake Gold Corp., April 29, 28 p. (Accessed June 2, 2016, at [http://chesapeakegold.com/financials/04%20CKG\\_MDA\\_Q4%202015%20SEDAR.pdf](http://chesapeakegold.com/financials/04%20CKG_MDA_Q4%202015%20SEDAR.pdf))
- Comisión Nacional de Hidrocarburos, 2015a, Resultado del area contractual 1: Federal District, Mexico, Comisión Nacional de Hidrocarburos, 1 p. (Accessed April 30, 2018, at <https://rondasmexico.gob.mx/102-campos/>)

- Comisión Nacional de Hidrocarburos, 2015b, Resultado del area contractual 2 [insert translation]: Federal District, Mexico, Comisión Nacional de Hidrocarburos, 1 p. (Accessed April 30, 2018, at <https://rondasmexico.gob.mx/102-campos/>)
- Comisión Nacional de Hidrocarburos, 2015c, Resultado del area contractual 4 [Result of the contractual area]: Federal District, Mexico, Comisión Nacional de Hidrocarburos, 1 p. (Accessed April 30, 2018, at <https://rondasmexico.gob.mx/102-campos/>)
- Comisión Nacional de Hidrocarburos, 2015d, Ronda 1—Aguas someras [Round 1—Shallow waters]: Federal District, Mexico, Comisión Nacional de Hidrocarburos. (Accessed April 30, 2018, at [https://rondasmexico.gob.mx/102\\_bloques/](https://rondasmexico.gob.mx/102_bloques/))
- Comisión Nacional de Hidrocarburos, 2015e, Ronda 1—Aguas someras—Segunda convocatoria [Round 1—Shallow waters—Second bid]: Federal District, Mexico, Comisión Nacional de Hidrocarburos. (Accessed April 30, 2018, at [https://rondasmexico.gob.mx/102\\_bloques/](https://rondasmexico.gob.mx/102_bloques/))
- Comisión Nacional de Hidrocarburos, 2015f, Tercera licitación de Ronda Uno—Reporte de resultados finales [Third Round One Bid—Final Results Report]: Federal District, Mexico, Comisión Nacional de Hidrocarburos, 2 p. (Accessed June 7, 2016, at <http://ronda1.gob.mx/wp-content/uploads/2015/12/R01L03-Reporte-Resultados-Finales.pdf>)
- Elementia, S.A. de C.V., 2015, Elementia firma contrato para ampliar la planta de cementos Fortaleza en Tula y alcanzar una capacidad de 3.5 millones de toneladas por año [Elementia signs a contract to expand the Fortaleza cement plant in Tula and to reach a capacity of 3.5 million tons per year]: Mexico City Federal District, Mexico, Elementia, S.A. de C.V., August 12, 2 p. (Accessed May 23, 2016, at [http://www.elementia.com/repository/eventos/esp\\_1445540862772.pdf](http://www.elementia.com/repository/eventos/esp_1445540862772.pdf))
- Flanagan D.M., 2017, Wollastonite: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 186–187.
- Fresnillo plc, 2016, Annual report 2015: London, United Kingdom, Fresnillo plc., 232 p. (Accessed May 27, 2016, at <http://www.fresnilloplc.com/media/208706/fresnilloara15web.pdf>)
- GoGold Resources Inc., 2015, Parral tailings project: Nova Scotia, Canada, GoGold Resources Inc. (Accessed May 26, 2016, at <http://gogoldresources.com/properties/parral/>)
- GoGold Resources Inc., 2016, GoGold Resources Inc.—Factsheet, 2015, Parral tailings project: Nova Scotia, Canada, GoGold Resources Inc., March, 2 p. (Accessed May 26, 2016, at [http://gogoldresources.com/index.php/component/rsfiles/preview?path=factsheets/factsheet\\_2016\\_03\\_23\\_v1.pdf](http://gogoldresources.com/index.php/component/rsfiles/preview?path=factsheets/factsheet_2016_03_23_v1.pdf))
- Goldcorp Inc., 2016a, Annual report 2015: Vancouver, British Columbia, Canada, Goldcorp Inc., 137 p. (Accessed May 26, 2016, at [https://s22.q4cdn.com/653477107/files/doc\\_financials/2015/Annual-Report-\(SEDAR\).pdf](https://s22.q4cdn.com/653477107/files/doc_financials/2015/Annual-Report-(SEDAR).pdf))
- Goldcorp Inc., 2016b, Los Filos—Overview and operating highlights: Vancouver, British Columbia, Canada, Goldcorp Inc. (Accessed May 26, 2016, at <http://www.goldcorp.com/English/Unrivalled-Assets/Mines-and-Projects/Latin-America/Operations/Los-Filos/Overview-and-Operating-Highlights/default.aspx>)
- Goldcorp Inc., 2016c, Peñasquito—Overview and operating highlights: Vancouver, British Columbia, Canada, Goldcorp Inc. (Accessed May 26, 2016, at <http://www.goldcorp.com/English/Unrivalled-Assets/Mines-and-Projects/Latin-America/Operations/Peñasquito/Overview-and-Operating-Highlights/default.aspx>)
- Golden Minerals Co., 2015, Golden Minerals reports third quarter 2015 results: Golden, Colorado, Golden Minerals Co., November 16. (Accessed May 31, 2016, at <http://www.irdirect.net/pr/release/id/1605516>)
- Golden Minerals Co., 2016, Velardeña properties: Golden, Colorado, Golden Minerals Co. (Accessed May 31, 2016, at <http://www.goldenminerals.com/rampup-velardena.php>)
- Grupo Mexico S.A.B. de C.V., 2016, Resultados—Cuarto trimestres de 2015 [Fourth Quarter 2015]: Mexico Federal District, Mexico, Grupo Mexico S.A.B. de C.V., 18 p. (Accessed May 17, 2016, at [http://www.gmexico.com/site/images/documentos/reportes\\_financieros/CEO%20Reporte%204T15.pdf](http://www.gmexico.com/site/images/documentos/reportes_financieros/CEO%20Reporte%204T15.pdf))
- Harrup, Anthony, 2016, PEMEX cuts spending to shore up finances: The Wall Street Journal, February 29. (Accessed June 9, 2016, at <http://www.wsj.com/articles/mexicos-pemex-moves-to-shore-up-its-budget-1456765294>)
- Ibarra, Carlos, 2015, Pemex compra en BCS a la minera Roca Fosfórica Mexicana [Pemex buys the mining company Roca Fosfórica Mexicana]: La Paz, Mexico, SDPnoticias.com, December 17. (Accessed May 23, 2016, at <http://www.sdpnoticias.com/local/baja-california-sur/2015/12/17/pemex-compra-en-bcs-a-la-minera-roca-fosforica-mexicana>)

- Industrias Peñoles, S.A.B. de C.V., 2016, 2015 annual report: Mexico City, Mexico, Industrias Peñoles, S.A.B. de C.V., 163 p. (Accessed June 1, 2016, at <http://www.penoles.com.mx/wPortal/content/conn/UCM/path/Carpetas/www/English/Press%20Room/Annual%20Reports/Penoles-2015-Annual-Report-low.pdf>.)
- International Monetary Fund, 2016, World economic outlook: Washington, DC, International Monetary Fund, April, 208 p. (Accessed June 7, 2016, at <http://www.imf.org/external/pubs/ft/weo/2016/01/pdf/text.pdf>.)
- McRae, M.E., 2017, Fluorspar: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 62–63.
- MDM Engineering Projects Ltd., 2013, National Instrument 43–101, independent technical report on the Parral tailings project: Port Louis, Mauritius, MDM Engineering Projects Ltd., February 20, 277 p. (Accessed May 26, 2016, at [http://gogoldresources.com/component/rsfiles/preview?path=technical\\_reports%252FNi43-101\\_Parral\\_2013-02-20.pdf](http://gogoldresources.com/component/rsfiles/preview?path=technical_reports%252FNi43-101_Parral_2013-02-20.pdf).)
- Minera y Metalúrgica El Boleo S.A. P. I. de C.V., 2015, Minera y Metalúrgica del Boleo obtiene su primera producción de cobre [Minera y Metalúrgica del Boleo obtains its first copper production]: Baja California Sur, Mexico, Minera y Metalúrgica El Boleo S.A. P. I. de C.V. January 26. (Accessed May 26, 2015, at <http://www.mmbolo.com/noticias.aspx>.)
- Petróleos Mexicanos S.A. de C.V., 2015, Hydrocarbon reserves of Mexico as of January 1, 2015: Mexico Federal District, Mexico, Petróleos Mexicanos S.A. de C.V., 21 p. (Accessed June 2, 2016, at [http://www.pemex.com/en/investors/publications/Reservas%20de%20Hidrocarburos%20Archivos/Reservas\\_2015\\_i.pdf](http://www.pemex.com/en/investors/publications/Reservas%20de%20Hidrocarburos%20Archivos/Reservas_2015_i.pdf).)
- Petróleos Mexicanos S.A. de C.V., 2016a, Monthly petroleum statistics—Liquid hydrocarbons production: Mexico Federal District, Mexico, Petróleos Mexicanos S.A. de C.V., 1 p. (Accessed June 2, 2016, at [http://www.pemex.com/en/investors/publications/Indicadores%20Petroleros%20Archivos/eprohdro\\_ing.pdf](http://www.pemex.com/en/investors/publications/Indicadores%20Petroleros%20Archivos/eprohdro_ing.pdf).)
- Petróleos Mexicanos S.A. de C.V., 2016b, Reporte de resultados de PEMEX al 31 de diciembre de 2015 [PEMEX results report as of December 31, 2015]: Mexico Federal District, Mexico, Petróleos Mexicanos S.A. de C.V., 35 p. (Accessed August 1, 2016, at [http://www.pemex.com/ri/finanzas/Reporte%20de%20Resultados%20no%20Dictaminados/Reporte\\_4T15.pdf](http://www.pemex.com/ri/finanzas/Reporte%20de%20Resultados%20no%20Dictaminados/Reporte_4T15.pdf).)
- Premier Oil PLC, 2015, Award of two blocks in Mexico's round 1: Edinburgh Scotland, United Kingdom, Premier Oil PLC press release, July 16. (Accessed June 3, 2016, at <http://www.premier-oil.com/premieroil/media/press/award-of-two-blocks-in-mexicos-round-1>.)
- Secretaría de Economía, 2016a, Diagnostico de empresas mexicanas con capital extranjero en la industria minero metalurgica del pais [Diagnosis of Mexican companies with foreign capital in the country's metallurgical mining industry]: Mexico Federal District, Mexico, Coordinacion General de Minería, Secretaría de Economía, 7 p. (Accessed June 9, 2016, at [http://www.gob.mx/cms/uploads/attachment/file/87194/diagnostico\\_empresas\\_mexicanas\\_capital\\_extranjero\\_1er\\_semestre\\_2015.pdf](http://www.gob.mx/cms/uploads/attachment/file/87194/diagnostico_empresas_mexicanas_capital_extranjero_1er_semestre_2015.pdf).)
- Secretaría de Economía, 2016b, Exportaciones totales de Mexico [Total exports from Mexico]: Mexico Federal District, Mexico, Secretaría de Economía, 1 p. (Accessed May 17, 2016, at <http://www.gob.mx/cms/uploads/attachment/file/81866/Anual-Exporta.pdf>.)
- Secretaría de Economía, 2016c, Importaciones totales de Mexico [Total imports from Mexico]: Mexico Federal District, Mexico, Secretaría de Economía, 2 p. (Accessed May 17, 2016, at <http://www.gob.mx/cms/uploads/attachment/file/81865/Anual-Importa.pdf>.)
- Secretaría de Economía, 2016d, Prontuario—Industria minero metalurgica [Summary—Metallurgical mining industry]: Mexico Federal District, Mexico, Secretaría de Economía, March, 54 p. (Accessed May 19, 2016, at [http://www.gob.mx/cms/uploads/attachment/file/88444/prontuario\\_industria\\_minero\\_metalurgica\\_0215\\_mayo2016.pdf](http://www.gob.mx/cms/uploads/attachment/file/88444/prontuario_industria_minero_metalurgica_0215_mayo2016.pdf).)
- Secretaría de Economía, 2016e, Prontuario—Industria minero metalurgica [Summary—Metallurgical mining industry]: Mexico Federal District, Mexico, Secretaría de Economía, May, 82 p. (Accessed June 8, 2016, at [http://www.gob.mx/cms/uploads/attachment/file/97697/prontuario\\_industria\\_minero\\_metalurgica\\_0215.pdf](http://www.gob.mx/cms/uploads/attachment/file/97697/prontuario_industria_minero_metalurgica_0215.pdf).)
- Secretaría de Energía, 2014a, Round 1: Federal District, Mexico, Secretaría de Energía, 10 p.
- Secretaría de Energía, 2014b, Round Zero: Federal District, Mexico, Secretaría de Energía, April, 20 p.
- Talos Energy LLC, 2015, Talos Energy enters into production sharing contracts for block 2 and 7 for call one of Mexico's oil and gas auction: Houston, Texas, Talos Energy LLC press release, September 25. (Accessed June 3, 2016, at <http://www.taloseneryllc.com/news/Talos-Energy-Enters-Into-Production-Sharing-Contracts-For-Blocks-2-and-7>.)
- Tolcin, A.C., 2017a, Cadmium: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 42–43.
- Tolcin, A.C., 2017b, Zinc: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 192–193.
- Torex Gold Resources Inc., 2016a, El Limón-Guajes: Toronto, Ontario, Canada, Torex Gold Resources Inc. (Accessed August 1, 2016, at <https://www.torexgold.com/projects/el-limon-guajes>.)
- Torex Gold Resources Inc., 2016b, Management discussion and analysis—For the year ended December 31, 2015: Toronto, Ontario, Canada, Torex Gold Resources Inc., 28 p. (Accessed May 31, 2016, at <https://www.torexgold.com/assets/docs/fs/2015-q4-mda.pdf>.)
- U.S. Census Bureau, 2016a, U.S. exports to Mexico 2006 to 2015 by 5-digit end-use code: U.S. Census Bureau. (Accessed August 1, 2016, at <http://www.census.gov/foreign-trade/statistics/product/enduse/exports/c2010.html>.)
- U.S. Census Bureau, 2016b, U.S. imports from Mexico from 2006 to 2015 by 5-digit end-use code: U.S. Census Bureau. (Accessed August 1, 2016, at <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c2010.html>.)
- U.S. Department of State, 2015, 2015 investment climate statement—Mexico: U.S. Department of State, May. (Accessed August 1, 2016, at <http://www.state.gov/e/eb/rls/othr/ics/2015/241661.htm>.)
- U.S. Energy Information Administration, 2015, Mexico—Analysis: U.S. Energy Information Administration country analysis brief, September 21. (Accessed May 19, 2016, at <http://www.eia.gov/beta/international/analysis.cfm?iso=MEX>.)
- World Steel Association, 2016, World steel in figures: Brussels, Belgium, World Steel Association, 30 p. (Accessed June 2, 2016, at <https://www.worldsteel.org/dms/internetDocumentList/bookshop/2016/World-Steel-in-Figures-2016/document/World%20Steel%20in%20Figures%202016.pdf>.)



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

(Metric tons unless otherwise specified)

Commodity <sup>2,3</sup>	2011	2012	2013	2014	2015
<b>METALS</b>					
Antimony <sup>4</sup>	100	169	294	270 <sup>e</sup>	NA
Bauxite	14,400	96,000	--	--	--
Bismuth, metal, refined	935	800	824	948	601
Cadmium, metal, refined	1,485	1,482	1,451	1,409	1,283
Copper: <sup>c</sup>					
Mine output, Cu content:					
Concentrates	297,000	342,000	317,000	327,000	344,000
Leaching, electrowon	147,000	158,000	163,000	188,000	200,000
Total	444,000	500,000	480,000	515,000	544,000
Metal:					
Smelter, primary	233,800	255,900	215,000	253,000	261,000
Refined:					
Primary	251,000	214,000	188,000	205,400	213,400
Secondary	5,000	5,000	5,000	5,000	5,000
Total	256,000	219,000	193,000	210,400	218,400
Gold:					
Mine output, Au content kilograms	88,648	102,802	119,774	117,771	124,581
Metal, refined do.	32,729	38,926	35,985	32,808	46,769
Iron and steel:					
Iron ore:					
Gross weight thousand metric tons	12,806	14,915	18,840	16,628	13,462
Fe content <sup>c</sup> do.	8,000	9,320	11,780	10,400	8,414
Metal:					
Pig iron do.	4,609	4,611	4,911	5,116	4,573
Direct-reduced iron do.	5,854	5,586	6,100	5,976	5,582
Total do.	10,463	10,197	11,011	11,092	10,155
Ferroalloys, electric arc furnace:					
Ferromanganese	73,683	61,845	60,675	67,506	67,500 <sup>e</sup>
Silicomanganese	139,048	161,221	157,855	164,852	164,900 <sup>e</sup>
Total	212,731	223,066	218,530	232,358	232,400 <sup>e</sup>
Crude steel thousand metric tons	18,110	18,073	18,208	18,995 <sup>e</sup>	18,260
Rolled products <sup>5</sup> do.	15,738 <sup>f</sup>	16,093 <sup>f</sup>	16,357 <sup>f</sup>	17,346 <sup>f</sup>	17,300 <sup>e</sup>
Lead:					
Mine output, Pb content	223,717	238,091	253,361	250,462	253,890
Metal, refined <sup>e</sup> :					
Primary <sup>f</sup>	132,000	129,000	121,000	119,000	116,000
Secondary <sup>f</sup>	216,000	255,000 <sup>f</sup>	250,000 <sup>f</sup>	245,000 <sup>f</sup>	240,000
Total <sup>f</sup>	348,000	384,000 <sup>f</sup>	371,000 <sup>f</sup>	364,000 <sup>f</sup>	356,000
Manganese ore: <sup>6</sup>					
Gross weight	474,820	510,942	580,309	652,465	600,000 <sup>e</sup>
Mn content	170,935	188,294	211,559	235,686	217,466
Molybdenum, mine output, Mo content	10,787	11,366	12,562	14,370	12,279
Silver:					
Mine output, Ag content kilograms	4,777,710	5,358,195	5,820,991	5,765,662	5,591,510
Metallurgical products, Ag content:					
Mixed gold and silver bars do.	817,981	923,056	1,322,059	1,091,439	1,100,000
Metal, refined, primary do.	2,336,141	2,329,963	2,318,718	2,272,620	2,300,000
Zinc:					
Mine output, Zn content	631,859	660,349	642,542	659,878	677,018
Metal, refined, primary	322,116	323,569	322,781	321,000	320,000

See footnotes at end of table.

TABLE 1—Continued  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2,3</sup>	2011	2012	2013	2014	2015	
<b>INDUSTRIAL MINERALS</b>						
Barite	134,727	139,997	343,585	420,000 <sup>e</sup>	265,598	
Cement, hydraulic <sup>7</sup>	thousand metric tons	35,400	36,184	34,612	36,597 <sup>f</sup>	36,600 <sup>e</sup>
Clays:						
Bentonite	563,795	956,224	826,886 <sup>f</sup>	474,025 <sup>f</sup>	470,000 <sup>e</sup>	
Common	7,721,040	8,436,673 <sup>f</sup>	7,948,840	8,552,374 <sup>f</sup>	8,550,000 <sup>e</sup>	
Fuller's earth	107,436	227,496	306,507 <sup>f</sup>	245,147 <sup>f</sup>	250,000 <sup>e</sup>	
Kaolin	120,003	163,148	379,110	342,917	320,078	
Diatomite	84,231	84,537	87,463	87,849	89,810	
Feldspar	382,497	380,441	164,484	150,726	159,372	
Fluorspar:						
Acid-grade	thousand metric tons	731	749	503 <sup>f</sup>	632 <sup>f</sup>	625
Metallurgical-grade	do.	475	487	700	476 <sup>f</sup>	400 <sup>e</sup>
Total	do.	1,206	1,236	1,203 <sup>f</sup>	1,108 <sup>f</sup>	1,025 <sup>e</sup>
Graphite, natural, amorphous <sup>8</sup>	18,970	19,730	21,163	22,018	22,000 <sup>e</sup>	
Gypsum and anhydrite, crude (yeso)	3,560,000 <sup>e</sup>	4,692,510	5,090,863	5,495,594	5,378,147	
Magnesium compounds:						
Magnesia <sup>9</sup>	85,700	88,400	86,000	85,500	77,800	
Magnesite	45,598	44,700	45,281	46,942	47,210	
Mica, all grades	--	160	160	160	160 <sup>e</sup>	
Nitrogen, N content of ammonia <sup>10</sup>	708,564	771,858	1,136,004	1,089,150	1,100,000 <sup>e</sup>	
Perlite	31,779	29,950	27,200	26,000 <sup>f</sup>	26,000 <sup>e</sup>	
Phosphate rock	thousand metric tons	1,691	1,725	2,217	1,663	1,677
Salt, all types	do.	8,812	8,730	9,461	10,251	9,088
Sodium compounds, sulfate, natural, bloedite	630,500	638,000	641,500	637,141	732,600	
Stone, sand and gravel:						
Calcite, common	2,366,160	4,694,156	5,168,984 <sup>f</sup>	4,790,427 <sup>f</sup>	4,800,000 <sup>e</sup>	
Dolomite	2,785,314	2,111,114	8,756,485	8,277,102	7,814,719	
Limestone	thousand metric tons	54,344	55,725	52,289	54,497 <sup>f</sup>	54,500 <sup>e</sup>
Marble	4,431,447	3,820,517	3,569,140 <sup>f</sup>	6,307,616 <sup>f</sup>	6,300,000 <sup>e</sup>	
Quartz, quartzite, glass sand (silica)	2,542,143	3,592,813	2,937,949	2,548,336	1,742,438	
Sand	thousand metric tons	86,324	92,374	90,723	108,765 <sup>f</sup>	109,000 <sup>e</sup>
Gravel	do.	68,965	71,870	65,874	93,448 <sup>f</sup>	93,500 <sup>e</sup>
Strontium minerals, celestite	40,669	46,192	67,778	64,931	79,022	
Sulfur, elemental, byproduct						
of petroleum and natural gas <sup>10</sup>	thousand metric tons	636	592	620	603	600
Talc	51,221	463,214	846,813	752,077 <sup>f</sup>	752,100 <sup>e</sup>	
Vermiculite	--	500	425	226 <sup>f</sup>	230 <sup>e</sup>	
Wollastonite	47,523	55,204	57,302	54,579	57,451	
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal:						
Run of mine:						
Metallurgical	thousand metric tons	20,967	16,276	15,718	15,874 <sup>f</sup>	15,900 <sup>e</sup>
Steam	do.	13,718	13,656	13,065	13,435	7,245
Total	do.	34,685	29,932	28,783	29,309 <sup>f</sup>	23,145
Washed metallurgical coal	do.	5,061	4,903	4,613	4,733	4,769
Coke: <sup>11</sup>						
Metallurgical	do.	2,016	2,047	2,098	2,097	1,657
Breeze	do.	105	118	119	133	122
Total	do.	2,121	2,165	2,217	2,230	1,779
Gas, natural: <sup>12</sup>						
Gross	million cubic meters	72,208 <sup>f</sup>	70,084 <sup>f</sup>	70,370 <sup>f</sup>	68,700 <sup>f,e</sup>	67,300 <sup>e</sup>
Marketable (dry)	do.	49,385	47,317	46,440	45,400 <sup>f</sup>	44,500 <sup>e</sup>

See footnotes at end of table.

TABLE 1—Continued  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2,3</sup>	2011	2012	2013	2014	2015	
MINERAL FUELS AND RELATED MATERIALS—						
Continued						
Petroleum: <sup>10</sup>						
Crude	thousand 42-gallon barrels	931,845	930,020	920,530	886,585	827,455
Condensate, natural gas liquids	do.	141,985	133,225	132,130	132,860	118,260
Total	do.	1,073,830	1,063,245	1,052,660	1,019,445	945,715
Refinery products:						
Liquefied petroleum gas	do.	7,811	9,198	9,198	9,636	7,807
Motor gasoline	do.	146,110	152,607	159,615	153,884	139,211
Jet fuel	do.	20,550	20,659	22,192	19,491	17,461
Distillate fuel oil, diesel	do.	99,937	109,354	114,391	104,609	100,241
Lubricants	do.	1,351	1,424	1,606	1,351	835
Residual fuel oil	do.	112,238	99,791	98,112	94,608	86,647
Asphalt	do.	9,527	8,432	6,826	8,724	6,446
Other, refinery fuel and losses	do.	13,834	20,915	27,631	24,346	24,000 <sup>e</sup>
Total	do.	411,358	422,380	439,571	416,649	382,600 <sup>e</sup>

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

<sup>1</sup>Table includes data available through June 13, 2016.

<sup>2</sup>In addition to the commodities listed, secondary aluminium and additional types of crude construction materials were produced, but output was not reported, and available information was inadequate to make reliable estimates of output.

<sup>3</sup>Sources: The Instituto Nacional de Estadística y Geografía and the Servicio Geológico Mexicano, Secretaría de Economía.

<sup>4</sup>Sb content of antimonial lead.

<sup>5</sup>Includes flat and long hot-rolled and seamless pipe products.

<sup>6</sup>Mostly oxide nodules; includes smaller quantities of direct-shipping carbonates and oxide ores for metallurgical and battery applications.

<sup>7</sup>Includes gray and white portland and masonry cement.

<sup>8</sup>Figures based on U.S. import data from the U.S. Census Bureau.

<sup>9</sup>Reported by Industrias Peñoles, S.A. de C.V. as the only major producer. Includes caustic, electromelt, hydroxide, and refractory.

<sup>10</sup>Source: Statistical Yearbook 2014 by Petroleos Mexicanos S.A. de C.V.

<sup>11</sup>Includes coke made from imported metallurgical coal.

<sup>12</sup>Source: U.S. Department of Energy.

TABLE 2  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity <sup>c</sup>
Antimony	United States Antimony Corp., 100%	San Jose (Wadley) Mines, S.L.P.	365.
Barite	Baramin S.A. de C.V. (private Mexican, 100%)	Galeana, N.L.	NA.
Do.	Barita de Santa Rosa, S.A. de C.V. (private Mexican, 100%)	Muzquiz, Coah.	256.
Do.	Barita de Sonora, S.A. (Grupo Acerero del Norte, S.A. de C.V., 100%)	Mazatan, Son.	219.
Do.	Minerales y Arcillas, S.A. de C.V. (private Mexican, 100%)	San Francisco del Huerto Mine in San Pedro, Coah.; La Escondida and Angelita Mines, N.L.	55.
Bismuth	metric tons Metalurgica Met-Mex Peñoles, S.A.B. de C.V. (Industrias Peñoles S.A.B. de C.V., 100%)	Torreon, Coah.	1,440.
Cement	CEMEX México (Cementos Mexicanos, S.A.B. de C.V., CEMEX 100%)	Ensenada, B.C.N.; Torreon, Coah.; Barrientos, D.F.; Arotonilco and Huichapan, Hgo.; Guadalajara and Zapotilic, Jal.; Hidalgo and Monterrey, N.L.; Tepeaca, Pue.; Tamuin and Valles, S.L.P.; Hermosillo and Yaqui, Son.; and Merida, Yuc.	29,300.
Do.	Holcim Mexico S.A. de C.V. (Holcim Group, 100%)	Acapulco, Gro.; Apaxco, Mex.; Hermosillo; Son.; Macuspana, Tab.; Orizaba, Ver.; Ramos Arizpe, Coah.; and Tecoman, Col.	12,200.
Do.	Corporación Moctezuma, S.A.B de C.V. (Cementos Molins S.A., 50%, and Buzzi Unicem SpA, 50%)	Apazapan, Ver.; Cerritos, S.L.P.; and Tepetzingo, Mor.	6,400.
Do.	Cooperativa La Cruz Azul, S.C.L. (private Mexican, 100%)	Cruz Azul, Hgo; and Lagunas, Oax.	5,000.
Do.	Grupo Cementos de Chihuahua, S.A.B. de C.V.	Chihuahua, Cuidad Juarez, and Samalayuca, Chih.	2,500.
Do.	Cementos Fortaleza S.A. de C.V. (Elementia, S.A. de C.V., 100%)	El Palmar, Tula, and Vito, Hgo.	2,000.
Coal	Minera Carbonífera Río Escondido, S.A. [Altos Hornos de México (AHMSA), 100%]	Mina I, Mina II, and Tajo I at Nava and Piedras Negras, Coah.	6,500.
Do.	Altos Hornos de Mexico, S.A.B. de C.V. (Grupo Acerero del Norte, S.A. de C.V., 78.9%)	Mines at Coah. and coking plant at Monclova, Coah.	3,000.
Do.	Carbonífera de San Patricio, S.A. de C.V. (private Mexican, 100%)	Progreso, Coah.	1,314.
Do.	Industrial Minera México, S.A. de C.V. (IMMSA) (Grupo México, S.A.B. de C.V., 90%)	Nueva Rosita, Coah.	1,500.
Copper	Mexicana de Cobre, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	La Caridad Mine, smelter, refinery, SX-EW <sup>2</sup> plant at La Caridad, Son.	170 concentrates 300 smelter, 25 SX-EW, <sup>2</sup> 300 refinery.
Do.	Mexicana de Cananea, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	Buenavista del Cobre Mine and SX-EW <sup>2</sup> plant at Cananea, Son.	150 concentrates 150 SX-EW. <sup>2</sup>
Do.	Minera y Metalurgica El Boleo S.A. P. I. de C.V. (MMB) (Korea Resources Corp., 90%, and Baja Mining Corp., 10%)	Boleo Mine and SX-EW <sup>2</sup> plant in B.C.S.	20 concentrates 20 SX-EW. <sup>2</sup>
Do.	Cobre del Mayo S.A. de C.V. (Invecture Group S. A. de C. V., 100%)	Piedras Verdes Mine and SX-EW <sup>2</sup> plant, Son.	20 concentrates 32 SX-EW. <sup>2</sup>
Do.	Cia. Minera La Parreña de C.V (Industrial Peñoles, S.A.B. de C.V., 100%)	Milpillas Mine and SX-EW <sup>2</sup> plant at Santa Cruz, Son.	45 SX-EW. <sup>2</sup>
Do.	Minera María S.A. de C.V. (Minera Frisco S.A.B de C.V, 99.6%)	Maria Mine and SX-EW <sup>2</sup> plant at Cananea, Son.	20 SX-EW. <sup>2</sup>
Do.	Red Tiger Mining Inc., 100%	Luz de Cobre Mine and SX-EW <sup>2</sup> plant at San Antonio del Huerta, Son.	8 SX-EW. <sup>2</sup>
Ferroalloys	Compañía Minera Autlán, S.A.B. de C.V. (Grupo Ferrominero, S.A. de C.V., 54%)	Plant in Tamos, Ver.	140.

See footnotes at end of table.

TABLE 2—Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity <sup>c</sup>
Ferroalloys—Continued	Compañía Minera Autlán, S.A.B. de C.V. (Grupo Ferrominero, S.A. de C.V., 54%)	Plant in Teziutlan, Pue.	38.
Do.	do.	Plant in Gomez Palacio, Dgo.	35.
Fluorspar	Mexichem Fluor, S.A. de C.V. (Mexichem, S.A.B. de C.V., 100%)	Las Cuevas Mine, Zaragoza, S.L.P.	1,200.
Do.	Fluorita de México, S.A. de C.V. (Mexichem, S.A.B. de C.V., 100%)	La Sabina Mine, Muzquiz, Coah.	100.
Gold, mine kilograms	Fresnillo plc. (Industrias Peñoles, S.A.B. de C.V., 75%)	Cienega, Dgo.; Fresnillo, Zac.; La Herradura, Son.: Noche Buena, Son.; and Saucito, Zac.	23,700.
Do.	do. Minera Peñasquito S.A. de C.V. (Goldcorp Inc., 100%)	Peñasquito Mine, Zac.	14,200.
Do.	do. Desarrollos Mineros San Luis S.A. de C.V. (Goldcorp Inc., 100%)	Los Filos Mines, Gro.	10,000.
Do.	do. Torex Gold Resources Inc., 100%	El Limon-Guajes (ELG) Mine, Gro.	10,200.
Do.	do. Minas de las Altas Pimerias, S.A. de C.V. (Goldcorp Inc., 100%)	El Sauzal Mine, Chih.	8,500. <sup>3</sup>
Do.	do. Minera Frisco S.A.B. de C.V., 100%	El Coronel Mine, Zac.	5,300.
Do.	do. Primero Empresa Minera, S.A. de C.V. (Primero Mining Corp., 100%)	San Dimas, Dgo.	4,500.
Do.	do. Agnico Eagle Mines Ltd., 100%	Pinos Altos Mine, Chih.	4,800.
Do.	do. Alamos Gold Inc., 100%	Mulatos Mine, Son.	4,300.
Do.	do. Timmins Gold Corp., 100%	San Francisco Mine, Son.	3,500.
Do.	do. Minera Mexicana La Ciénega, S.A. de C.V. (Fresnillo plc., 100%)	La Cienega Mine, Dgo.	3,400.
Do.	do. Ocampo Mining, S.A. de C.V. (Minera Frisco S.A.B. de C.V., 100%)	Ocampo Mine, Chih.	3,300.
Do.	do. Yamana Gold Inc., 100%	Las Mercedes Mine, Son.	3,200.
Do.	do. GoGold Resources Inc., 100%	Santa Gertrudis Mine, Son.	1,600.
Gold, refined	do. Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 100%)	Torreón, Coah.	53,900.
Graphite	Grafitos Mexicanos, S.A. de C.V., 100%	Lourdes, Topiyeca, and San Juan Mines, Son.	60.
Gypsum	Cía. Occidental Mexicana, S.A. de C.V. (private Mexican, 51%, and Domtar, Ltd., 49%)	Santa Rosalia on San Marcos Island, B.C.S.	2,500.
Iron ore	Altos Hornos de Mexico, S.A.B. de C.V. (Grupo Acerero del Norte, S.A. de C.V., 78.9%)	La Perla Mine, Chih.; Hercules Mine, Coah.; and Cerro de Mercado Mine, Dgo.	5,000.
Do.	do. Consorcio Minero Benito Juárez Peña Colorada S.A. de C.V. (ArcelorMittal Holdings AG, 50%, and Ternium S.A., 50%)	Peña Colorada Mine, Col.	4,500.
Do.	do. ArcelorMittal Mexico S.A. de C.V. (ArcelorMittal Holdings AG, 100%)	El Volcan Mine, Son.	3,600.
Do.	do. ArcelorMittal Las Truchas, S.A. de C.V. (ArcelorMittal Holdings AG, 100%)	Las Truchas Mine, Mich.	2,600.
Lead	Industrias Peñoles S.A.B. de C.V. (private Mexican, 100%)	Mines at Bismark, Chih.; Francisco I. Madero, Naica, Chih.; and Sabinas, Dgo.	51.
Do.	do. Industrial Minera México, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	Charcas, S.L.P.; Santa Barbara and Santa Eulalia, Chih.; and San Martín, Zac.	35.
Do.	do. Fresnillo plc (Industrias Peñoles, S.A.B. de C.V., 75%)	Mines at Fresnillo, Zac., La Cienega, Dgo.; and Saucito, Zac.	38.
Do.	do. Minera San Francisco del Oro, S.A. de C.V. (Minera Frisco, S.A.B. de C.V., 99.6%)	San Francisco del Oro Mine, Chih.	13.
Do.	do. Minera Tayahua, S. A. de C. V. (Minera Frisco, S.A.B. de C.V., 89.9%)	Tayahua Mine, Zac.	10.

See footnotes at end of table.

TABLE 2—Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity <sup>c</sup>
Lead—Continued	Minera Tizapa S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 51%; Dowa Mining Co., 39%; Sumitomo Corp., 10%)	Tizapa Mine, Mex.	10.
Do.	Metalurgica Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 100%)	Torreón, Coah.	180 refined lead.
Manganese	Cía. Minera Autlán, S.A.B. de C.V. (Grupo Ferrominero, S.A. de C.V., 81.75%, and private Mexican, 18.25%)	Molango, Naopa, and Nonoalco Mines, Hgo.	600 ore and concentrate.
Molybdenum	Mexicana de Cobre, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	La Caridad Mine and molybdenum plant, Son.	11.
Do.	Mexicana de Cananea, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	Buena Vista del Cobre Mine and molybdenum plant, at Cananea, Son.	2.
Petroleum thousand 42-gallon barrels per day	Petróleos Mexicanos, S.A. de C.V. (PEMEX) (Government, 100%)	Comalcalco, Poza Rica, Ver., and Gulf of Campeche, Cam., Districts	3,500.
Petroleum products do.	do.	Cadereyta, N.L.; Madero, Tamps.; Minatitlán, Ver.; Salamanca, Gto.; Salina Cruz, Oax.; and Tula de Allende, Hgo.	1,700.
Phosphate rock	do.	San Juan de la Costa Mine, B.C.S.	NA.
Salt	Exportadora de Sal, S.A. de C.V. (Government, 51%, and Mitsubishi Corp., 49%)	Solar salt complex at Guerrero Negro, B.C.S.	9,500.
Silver, mine kilograms	Fresnillo plc. (Industrias Peñoles S.A.B. de C.V., 75%)	Fresnillo Mine, Zac.	1,100,000.
Do.	do. Minera Peñasquito S.A. de C.V. (Goldcorp Inc., 100%)	Peñasquito Mine, Zac.	794,000.
Do.	do. Fresnillo plc. (Industrias Peñoles S.A.B. de C.V., 75%)	Saucito Mine, Zac.	567,000.
Do.	do. Industrial Minera México, S.A. de C.V. (Grupo México, S.A.B. de C.V., 90%)	Charcas, S.L.P.; San Martín Mine, Zac.; Santa Barbara, Chih.; Santa Eulalia, Chih.; and Taxco, Gro.	336,000.
Do.	do. Pan American Silver Corp., 100%	La Colorada Mine, Zac.; and Alamo Dorado Mine, Son.	283,000.
Do.	do. Coeur Mexicana S.A. de C.V. (Coeur Mining, Inc., 100%)	Palmarejo Mine, Chih.	190,000.
Do.	do. Primero Empresa Minera, S.A. de C.V. (Primero Mining Corp. 100%)	San Dimas Mine, Dgo.	170,000.
Do.	do. Fortuna Silver Mines Inc., 100%	San José Mine, Oax.	125,000.
Do.	do. Minera Mexicana La Ciénega, S.A. de C.V. (Fresnillo plc., 100%)	La Ciénega Mine, Dgo.	114,000.
Do.	do. Minera Tizapa S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 51%; Dowa Mining Co., 39%; Sumitomo Corp., 10%)	Tizapa Mine, Mex.	150,000.
Do.	do. Co. Minera Sabinas, S.A. de C.V. (Industrias Peñoles, S.A.B. de C.V., 100%)	Sabinas Mine, Zac.	140,000.
Do.	do. GoGold Resources Inc., 100%	Parral tailings project, Chih.	34,000.
Do.	do. Golden Minerals Co., 100%	Velardeña, Dgo.	16,000. <sup>4</sup>
Do.	do. Argonaut Gold Inc., 100%	La Colorada Mine, Son.	10,000.
Silver, refined	do. Metalurgica Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 100%)	Torreón, Coah.	3,350,000.
Sodium sulfate	Industrias Magnelec, S.A. de C.V. (Industrias Peñoles, S.A.B. de C.V., 100%)	Química del Rey plant, Laguna del Rey, Coah.	780.

See footnotes at end of table.

TABLE 2—Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity <sup>e</sup>
Steel	ArcelorMittal Lazaro Cardenas S.A de C.V. (ArcelorMittal Holdings AG, 100%)	Facilities at Lazaro Cardenas, Mich.	5,300 steel, 4,000 pellet.
Do.	Altos Hornos de Mexico, S.A.B. de C.V. (Grupo Acerero del Norte, S.A. de C.V., 78.91%)	Steelworks at Monclova, Coah.	3,320 steel, 3,800 pellet.
Do.	Hylsa S.A. de C.V. (Ternium S.A., 88.72%)	Steel works and direct-reduction units at Monterrey, N.L., and Puebla, Pue.; pelletizing plant in Col. and El Encino, Jal.	3,100 steel, 1,500 pellet.
Do.	DEACERO, S.A. de C.V. (private Mexican, 100%)	Steelworks at Saltillo, Coah., and Celaya, Gto.	1,450.
Do.	Tubos de Acero de México, S.A. (Teranis S.A., 100%)	Veracruz, Ver.	1,000.
Strontium (celestite)	Minas de Celestita, S.A. de C.V.	Octubre Mine, Coah.	NA.
Sulfur	Petróleos Mexicanos, S.A. de C.V. (PEMEX)	Nationwide petroleum operations	890.
Wollastonite	Minera Roca Rodando S. de R.L. de C.V. (S&B Industrial Minerals S.A.)	Pilares Mine, Hermosillo, Son.	58.
Zinc	Industrias Peñoles S.A.B. de C.V. (private Mexican, 100%)	Mines at Bismark, Chih.; Francisco I. Madero, Naica, Chih.; Sabinas, Dgo., and Verlardeña, Dgo.	210.
Do.	Industrial Minera México, S.A. de C.V. (IMMSA) (Grupo México, S.A.B. de C.V., 90%)	Charcas, S.L.P.; Santa Barbara and Santa Eulalia, Chih.; and San Martin, Zac.	130.
Do.	Fresnillo plc (Industrias Peñoles, S.A.B. de C.V., 75%)	Mines at Fresnillo, Zac.; La Cienega, Dgo.; and Saucito, Zac.	48.
Do.	Minera Tayahua, S. A. de C. V. (Minera Frisco, S.A.B. de C.V., 89.9%)	Tayahua Mine, Zac.	40.
Do.	Minera Tizapa S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 51%; Dow Mining Co., 39%; Sumitomo Corp., 10%)	Tizapa Mine, Mex.	38.
Do.	Minera San Francisco del Oro, S.A. de C.V. (Minera Frisco, S.A.B. de C.V., 99.6%)	San Francisco del Oro Mine, Chih.	23.
Do.	Metalurgica Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles S.A.B. de C.V., 100%)	Torreón, Coah.	270 refined zinc.
Do.	Industrial Minera México, S.A. de C.V. (IMMSA) (Grupo México, S.A.B. de C.V., 90%)	Zinc refinery at S.L.P.	105 refined zinc.

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>State abbreviations used in this table include the following: Baja California Norte (B.C.N.), Baja California Sur (B.C.S.), Campeche (Cam.), Chihuahua (Chih.), Coahuila (Coah.), Colima (Col.), Distrito Federal (D.F.), Durango (Dgo.), Guanajuato (Gto.), Guerrero (Gro.), Hidalgo (Hgo.), Jalisco (Jal.), Mexico (Mex.), Michoacan (Mich.), Morelos (Mor.), Nuevo Leon (N.L.) Oaxaca (Oax.), Puebla (Pue.), San Luis Potosi (S.L.P.), Sinaloa (Sin.), Sonora (Son.), Tabasco (Tab.), Tamaulipas (Tamps.), Veracruz (Ver.), Yucatan (Yuc.), and Zacatecas (Zac.).

<sup>2</sup>Solvent extraction-electrowinning.

<sup>3</sup>Closed.

<sup>4</sup>Suspended.