

2017–2018 Minerals Yearbook

GREECE

THE MINERAL INDUSTRY OF GREECE

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Note: In this chapter, information for 2017 is followed by information for 2018.

The mineral industry of Greece held leading positions globally in the production of bentonite, magnesite, perlite, and pumice. In 2017, Greece was the world's 2d-ranked perlite producer, 3d-ranked pumice producer, 4th-ranked bentonite producer (tied with India), and 8th-ranked magnesite producer (not including the United States). The country accounted for 20% of world perlite output; and of pumice and bentonite, 5% each. Greece was the leading source of perlite and pumice for the United States, accounting for 95% and 93% of imports, respectively. The country was the sole European Union member state that produced nickel and ferronickel from its own laterite deposits (table 1; Ministry of Environment & Energy, 2015, p. 11; Bennett, 2019; Bray, 2019; Crangle, 2019; West, 2019).

Greece has regionally significant reserves of bauxite, copper, gold, iron, magnesite, nickel, silver, and zinc and such industrial minerals as bentonite, gypsum, huntite, kaolin, limestone, perlite, and pumice. In 2017, Greece held the world's largest reserves of perlite and the sixth-largest reserves of magnesite (Bennett, 2018; Bray, 2018; Tzeferis, 2018).

Minerals in the National Economy

Greece's real gross domestic product (GDP) increased by 1.5% in 2017 compared with that of 2016; the nominal GDP was EUR180.2 billion (\$195.2 billion¹) in 2017. Mineral extraction and processing made up about 3.8% of the country's GDP in 2017. During the year, the manufacture of base metals contributed 1.1% of gross value added; coke and refined petroleum products, 0.9%; fabricated metal products, 0.8%; and nonmetallic mineral products, 0.5%; mining and quarrying contributed 0.4% of the gross value added (Hellenic Statistical Authority, 2018a, p. 2–4; 2018c).

The total mining and quarrying output of Greece increased by 9.8% in 2017. Industrial production increased by 3.8%, and manufacturing output, by 2.9%. The manufacture of base metals increased by 17.6%; of coke and refined petroleum products, by 4.5%; fabricated metal products, by 3.1%; and nonmetallic mineral products, by 2.8% (Hellenic Statistical Authority, 2020, p. 76).

Production

In 2017, changes in mineral industry output compared with that of 2016 varied significantly by commodity. The production of gold increased by 654%; nitrogen, by 73%; sulfur, by 72%; jet fuel, by 29%; crude magnesite and pumice, by 28% each; crude bentonite, by 25%; treated attapulgite clay, by 22%; olivinite and raw steel, by 17% each; marble, by 15%; lignite

coal, by 14%; processed bentonite, by 12%; gasoline, by 11%; and gypsum, by 10%. Greece did not produce any kerosene in 2017. Sand and gravel (industrial, unspecified) output decreased by 46%; huntite, by 42%; crude perlite, by 24%; lead, by 23%; silver, by 19%; and screened perlite, by 13% (table 1; Ministry of Environment & Energy, 2018).

Structure of the Mineral Industry

Most mineral companies were privately owned. Government ownership was limited primarily to coal and nickel. The Government held a 55.2% stake in LARCO G.M.M. S.A., which was a leading nickel producer globally as well as the largest ferronickel producer in Europe in terms of output; the Government also held a 34.12% stake in Public Power Corp. S.A.-Hellas (PPC), which was Greece's leading lignite producer and electricity generation company (table 2; Energy Press, 2018; Public Power Corporation S.A.-Hellas, 2018b).

In 2017, a total of 600 companies were active in the mining sector. Of these companies, 329 were engaged in quarrying of ornamental and building stone, chalk, gypsum, limestone, and slate; 187, in mining of clays and kaolin and operation of sand and gravel pits; 15, in mining of nonferrous metal ores; 9, in extraction of lignite; 5, in extraction of salt; 4, in extraction of crude petroleum; 4, in mining of iron ore; and 3, in mining of chemical and fertilizer minerals (Hellenic Statistical Authority, 2019d).

Mineral Trade

Greece's mineral industry was highly export oriented, with exports accounting for about 65% of total mineral sales. The primary exported mineral commodities were alumina, aluminum, bauxite, bentonite, caustic magnesite, marble, nickel, and pumice. Crude materials, including mineral commodities, accounted for 4.5% of total exports. Mineral fuels, lubricants, and related materials were the leading export goods category, accounting for about 38% of Greece's total exports of goods of \$32.7 billion in 2017. Mineral fuels, lubricants, and related materials were also the leading import goods category, accounting for about 24% of total imports of goods of \$54.5 billion in 2017. Crude materials, including mineral commodities, accounted for 2.5% of total imports (Hellenic Statistical Authority, 2018b, p. 7–11; Tzeferis, 2018).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—In 2017, the production of bauxite increased by 3%, whereas alumina and aluminum output remained about the same. Greece continued to

¹Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at an annual average exchange rate of US\$1.00=EUR0.923 for 2017.

be a leading bauxite producer in Europe, with an output of about 1.93 million metric tons (Mt) in 2017; alumina and aluminum output were 821,000 metric tons (t) and 181,630 t, respectively. In July, Imerys S.A. of France, a leading global producer of industrial minerals, completed its acquisition of Kerneos S.A. of France, which was the leading global calcium aluminates cement producer. Kerneos was the parent company of Elmin Bauxites S.A. and European Bauxites S.A. Elmin Bauxites was a regionally significant producer of bauxite for a range of end products, including alumina, aluminous cement, iron and steel, mineral fibers and abrasives, and portland cement. The company exported its products to more than 20 countries (Kerneos S.A., 2015; Elmin Bauxites S.A., 2017; Imerys S.A., 2017; 2018, p. 5, 11, 20; Ministry of Environment & Energy, 2018).

Gold, Lead, Silver, and Zinc.—Hellas Gold S.A., which was a subsidiary of Eldorado Gold Corp. of Canada, operated the Stratoni silver, lead, and zinc mine on the Halkidiki Peninsula in northern Greece. In 2017, Hellas Gold produced 36,699 t of lead-silver and zinc concentrate at Stratoni, which was about 24% lower than in 2016 owing to decreased mill throughput and lower lead and zinc grades. Decreased mill throughput was a result of the limited amount of reserves and slower underground development to access new areas than planned. Processed ore grades were 5.8% lead and 9.4% zinc in 2017. Hellas Gold used a multistage flotation process to extract a lead-silver concentrate and a zinc concentrate, which were then shipped from the ports at Stratoni and Thessaloniki to overseas refineries (Eldorado Gold Corp., 2018, p. 16).

Gold production increased more than sixfold in Greece in 2017 owing to increased production in Olympias by Hellas Gold. On December 31, 2017, Hellas Gold achieved commercial production at the Olympias gold, silver, lead, and zinc mine, also located on the Halkidiki Peninsula in northern Greece. The company used a flotation process at the Olympias underground mine to produce three concentrates (lead-silver, zinc, and gold-bearing pyrite-arsenopyrite) that were then sold and shipped to overseas refineries. In 2017, Hellas Gold produced 575 kilograms (kg) of gold by precommercial production at the Olympias Mine. Ore grades were 7.5 grams per metric ton (g/t) gold, 116 g/t silver, 3.5% lead, and 4.8% zinc in 2017. The company reported that the Olympias Mine had very high gold grades and an ore body that would allow for underground mining rates of up to 1 million metric tons per year (Mt/yr). As part of the completion of Olympias Phase II, Hellas Gold planned to commission a new paste backfill plant and an additional tailings filter to provide maximum operational flexibility in 2018 (Eldorado Gold Corp., 2018, p. 17).

In November, Hellas Gold announced its intention to put the Skouries Mine on care-and-maintenance status. Project development in Skouries, which was a gold-copper porphyry deposit with 158 Mt grading 0.7 g/t gold in total reserves and which was also located on the Halkidiki Peninsula in northern Greece, was slowed considerably in 2017 owing to continued permitting delays. The mine was 50% constructed and would be initially operated as an open pit and underground mine, later followed by only underground mining. Hellas Gold expected to put Skouries on care-and-maintenance status in the second quarter of 2018 (Eldorado Gold Corp., 2018, p. 19; 2019b).

Nickel.—LARCO mined sedimentary-type nickel laterite deposits at the Agios Ioannis, Evia, and Kastoria Mines. In 2017, LARCO extracted 2.34 Mt of nickeliferous laterite ore compared with 2.45 Mt in 2016. LARCO remained one of the leading nickel suppliers globally; however, the Government was in the process of evaluating possible privatization or closure of the company owing to its ongoing financial losses and outstanding debts. A substantial share of LARCO's debts were owed to its power supplier PPC. In November, LARCO filed an appeal against a decision by the Directorate General for Competition of the European Commission (EC) that ordered the recovery of incompatible state aid by Greece to the company. An adverse verdict could substantially affect LARCO's future operations (European Commission, 2016; Energy Press, 2017, 2018; Dokas, 2018; Kalamara, 2018; LARCO G.M.M. S.A., 2018; Ministry of Environment & Energy, 2018).

Industrial Minerals

Cement.—Greece's cement sector consisted of three integrated cement companies with a total installed production capacity of 15.1 Mt/yr in seven plants. Capacity utilization remained low at less than 50%. Heracles General Cement S.A. (a subsidiary of LafargeHolcim Ltd. of Switzerland) was the leading cement producer in Greece with a 7.1 Mt/yr capacity. TITAN Group, which was the leading cement producer in southeastern Europe, was the second-ranked producer in Greece and had a total capacity of about 7 Mt/yr. Halyps Cement S.A. (a subsidiary of HeidelbergCement Group of Germany since 2016) had a 1-Mt/yr capacity (table 2; International Cement Review, 2017, p. 152–153).

TITAN Group owned 5 cement plants, 1 grinding plant, 8 terminals, 26 quarries, and 1 dry mortar plant in Greece. The company reported that building activity in the country decreased further in 2017 following the completion of various major public works projects in the first half of the year. Private building activity remained subdued with minimal new construction, despite the increasing demand from the expanding tourism sector. TITAN's cement export volume remained high in 2017 (TITAN Group, 2018a, p. 14; 2018b, p. 7).

Clay (Bentonite) and Perlite.—In 2017, Greece produced about 1.1 Mt of crude bentonite, 880,000 t of processed bentonite, 700,000 t of crude perlite, and 690,000 t of screened perlite. S&B Industrial Minerals—a leading producer of bentonite, perlite, and wollastonite globally with mines and plants in China, Europe, and the United States—had been a subsidiary of Imerys since 2015. Since the acquisition, Imerys had been the leading producer of bentonite (including binders for foundry, sealing solutions, additives for drilling, and functional additives) in Europe and the leading global producer of continuous casting fluxes for steel and wollastonite, including functional additives for polymers and paints (Imerys S.A., 2015; O'Driscoll, 2015; Ministry of Environment & Energy, 2018).

Magnesium Compounds (Magnesite).—In 2017, Greece produced 590,000 t of magnesite ore, 95,400 t of caustic-calcined magnesite, and 21,900 t of dead-burned magnesite. Huntite output decreased to 13,500 t in 2017 (Ministry of Environment & Energy, 2018).

Grecian Magnesite S.A., which was a leading producer and exporter of caustic-calcined magnesite globally, operated mines in Chalkidiki on the Halkidiki Peninsula. The Chalkidiki deposits consisted of three main active concessions—Yerakini, covering an area of 7 square kilometers (km²); Ormilina, 10 km²; and Kastri, 23 km². The company's total production capacity was about 200,000 metric tons per year (t/yr) of calcined products and 50,000 t/yr of basic monolithic refractories. Grecian Magnesite completed the expansion at its caustic calcined magnesia processing plant in Chalkidiki with the installation of a new 60-metric-ton-per-day grinding facility in 2016. As a result, the company's production capacity of ground end products increased to 40,000 t/yr from 18,000 t/yr. Grecian Magnesite exported 75% of its output to Europe; 17% to countries in the Asia and the Pacific Region, and Africa; and 8% to the Americas (Grecian Magnesite, S.A., 2015, 2018).

Mineral Fuels

Coal.—Lignite coal constituted Greece's primary mineral fuel output and provided for about one-third of the energy input for electricity generation in 2017. The share of lignite-fired electricity had decreased to 33% since 2007, when it accounted for about 55%, owing to an increase in renewable energy sources, but it remained the most significant source of electricity. Greece was the fourth-ranked producer of lignite in the European Union with a 10% share after Germany, Poland, and Czechia in 2017. Lignite was extracted by PPC primarily from its mines in Megalopolis and West Macedonia for use by the company's powerplants. In 2017, Greece's lignite output increased by 14.5% to 37.4 Mt, of which 35.4 Mt came from PPC mines. The remaining 2 Mt of lignite output was from smaller mines. The increase in lignite output in 2017 was owing to a decrease in electricity generation from hydropower sources. There was no mining of anthracite coal; consumption was very low and used mainly for industrial purposes. In 2017, anthracite coal imports were about 400,000 t, which was unchanged from those of 2016. The Government planned to divest 40% of PPC's lignite units and mines to create a more competitive national electricity market. The privatization program would apply to the lignite-fired plant Meliti 1, the proposed Meliti 2 plant, the Megalopoli 3 and 4 plants, and all mining assets and resources related to those units (Papamichalopoulos, 2017, p. 225; Euracoal, 2018, p. 9–10; Public Power Corporation S.A.-Hellas, 2018a).

Petroleum.—Kavala Oil S.A. (a subsidiary of Energean Oil & Gas S.A.) remained by far the leading hydrocarbon producer in Greece in 2017. The company reported 40.5 million barrels (Gbbbl) of proven plus probable (2P) petroleum reserves and 23.8 Gbbbl of contingent resources onshore and offshore Greece. In 2017, Kavala Oil produced 2,803 barrels per day (bbl/d) of petroleum from its Prinos offshore oilfield, which was a 20% decrease compared with that of 2016. The company was unable to maintain the rate of production growth achieved in 2016 owing to problems related to asphalt precipitation in the first half of the year. Following the completion of modifications to the well design and refinement of operations, Kavala Oil achieved an average output of 3,405 bbl/d in Q4. Contingent resources were recognized in Prinos. A development well was planned for inclusion in the ongoing Prinos infill drilling

campaign following the successful appraisal well drilled into the Kazaviti structure in 2016, which involved the deepening of development well PA-36. The company's work on the Katakolo project in the Peloponnese focused on execution of the necessary environmental studies required to obtain approval for the construction of the initial two wells and associated pilot production facilities. In 2017, 10 Gbbbl of proved and probable reserves were identified as a result of subsurface studies. Resources were also recognized on the 1990s Delta discovery, which is below the partly developed Prinos North satellite. Kavala Oil prepared a proposal for drilling an extended-reach well from the Prinos platform. In September, Energean sold 60% of its interest in the Ioannina and Aitolokarnania Blocks, onshore western Greece, to Repsol S.A. of Spain (Papamichalopoulos, 2017, p. 225; Energean Oil & Gas S.A., 2018a, p. 17, 29, 30; 2018b, p. 2).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

Minerals in the National Economy

Greece's real gross domestic product (GDP) increased by 1.9% in 2018; the nominal GDP was EUR184.7 billion (\$217.8 billion²). The mining and quarrying sector and the manufacturing sector—which included the manufacture of base metals, coke and refined petroleum products, fabricated metal products, and nonmetallic mineral products—made up about 13.1% of the country's GDP in 2018. Industrial production, including energy and construction, increased by 1.7% in 2018, and manufacturing output, by 2.7%. Total mining and quarrying output remained about the same as in 2017. The manufacture of base metals increased by 3.7%; coke and refined petroleum products, by 3.5%; fabricated metal products, by 3.2%; and nonmetallic mineral products, by 1.5% (Hellenic Statistical Authority, 2019b; 2019c, p. 2–4; 2020, p. 29, 76).

Mineral fuels, lubricants, and related materials was the leading export goods category, accounting for about 29% of Greece's total exports of goods of \$39.6 billion in 2018. Crude materials, including mineral commodities, accounted for 3.5% of total exports. Mineral fuels, lubricants, and related materials was also the leading import goods category, accounting for about 29% of total imports of goods of \$64.9 billion in 2018. Crude materials, including mineral commodities, accounted for 2.5% of Greece's total imports (Hellenic Statistical Authority, 2019a, p. 7, 10).

Production

The production of gold increased by 245%; crude petroleum, by 80%; crude bentonite, by 23%; sulfur, by 21%; marble, by 15%; olivinite, by 14%; mined lead, by 13%; and mined zinc, by 11%. Santorin earth output decreased by 19%; bauxite, by 17%; caustic-calcined magnesite, by 15%; and screened perlite, by 11% (table 1; Ministry of Environment & Energy, 2019).

²Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at an annual average exchange rate of US\$1.00=EUR0.848 for 2018.

Metals

Gold, Lead, Silver, and Zinc.—In 2018, Hellas Gold mined 146,726 t of ore at grades of 6.7% lead and 9.3% zinc and produced 37,091 t of lead-silver and zinc concentrate at Stratoni, which was slightly higher than that of 2017, owing to higher lead and silver feed grades. The company sold 34,764 t of concentrate from Stratoni to overseas refineries, adding some unsold concentrate to inventory at the end of 2018. Stratoni was projected to have a mine life of 3 years based on current proven and probable reserves. At Olympias, Hellas Gold produced 1,454 kg of gold, 17,520 kg of silver, 5,545 t of lead, and 7,810 t of zinc in 2018. This was the first year of full commercial operation at the mine. Production was higher in the first half of 2018 than in the second half of the year, when the company had to undertake underground paste backfill and encountered metallurgical issues. Hellas Gold sold 1,090 kg of gold (in gold-bearing pyrite-arsenopyrite concentrate form) from Olympias in 2018. The mine was projected to have a mine life of 22 years. Hellas Gold placed the Skouries project on care-and-maintenance status in 2018 owing to a failure to receive the requisite permits from the Government. Hellas Gold filed an application permit to have dry stack tailings during the year. Skouries was projected to have a mine life of 23 years (Eldorado Gold Corp., 2019a, p. 12, 13, 16, 17, 19).

Nickel.—In 2018, LARCO extracted 2.12 Mt of nickeliferous laterite ore compared with 2.34 Mt in 2017. The company lost its environmental license to operate in 2018, although it continued to mine. The European Commission (EC) ordered the recovery of \$151 million in incompatible Government aid by Greece to LARCO and subsequently took the Greek Government to the European Court of Justice for its failure to recover the funds (Ministry of Environment & Energy, 2019; Koutantou, 2020).

Outlook

Greece is expected to remain a globally significant producer of bentonite, magnesite, perlite, and pumice, and a regionally significant producer of aluminum and lignite. Exports of aluminum, bauxite, bentonite, and perlite are likely to increase further as the country's leading producers are integrated into the global supply networks of their foreign owners. The production of nickel and ferronickel is likely to decrease substantially owing to LARCO's anticipated restructuring and possible closure. Gold, lead, silver, and zinc production is expected to continue to increase with increased output at the Olympias Mine and the Stratoni Mine by Eldorado Gold and may increase further if the company receives the requisite operating permits for the Skouries project. Crude petroleum production may also increase further as Energean continues to develop new onshore and offshore hydrocarbon fields.

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TABLE 1
GREECE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS					
Aluminum:					
Bauxite ³	1,872,710	1,831,660	1,880,000 ^r	1,927,000	1,607,000
Alumina, Al ₂ O ₃ equivalent	813,500	806,500	820,800	821,000	827,000
Metal, primary	173,160	179,420	181,190	181,630	184,800
Ferroalloys, ferronickel:					
Gross weight	94,950	89,130	87,880 ^r	86,140	80,700 ^e
Ni content	18,481	17,113	17,071	16,781	15,720
Gold, mine, Au content kilograms	503	465	109 ^r	822	2,839
Iron ore, mine					
Gross weight	2,317,000	2,340,000	2,209,000	2,284,000	2,115,000
Fe content	574,000	580,000	547,000	566,000	524,000
Iron and steel, steel:					
Raw steel thousand metric tons	1,022	910	1,158	1,359	1,464
Products, semimanufactured do.	965	875	1,100 ^e	1,200 ^e	1,300 ^e
Lead, mine, Pb content	11,800	9,200	11,300 ^r	8,700	9,800
Nickel, mine, laterite ore, Ni content thousand metric tons	21	20	19 ^r	19	18
Silver, mine, Ag content kilograms	35,785	25,170	29,409 ^r	23,967	25,237
Tin, smelter, secondary	--	--	--	50 ^e	50 ^e
Zinc, mine, Zn content	22,700 ^r	14,900 ^r	18,900 ^r	18,300	20,300
INDUSTRIAL MINERALS					
Cement, hydraulic thousand metric tons	5,105 ^r	5,289 ^r	6,540 ^r	6,246	6,580
Clay:					
Bentonite:					
Crude	1,011,480	1,123,320	883,220	1,100,000	1,355,000
Processed	850,000	807,550	787,000 ^r	880,000	824,000
Fuller's earth, attapulgite, crude	45,000	107,740	44,500 ^r	54,280	53,300
Gypsum, mine, including anhydrite	664,290	649,280	778,000 ^r	855,000	800,000
Magnesite:					
Caustic-calcined	70,660	86,800	89,780	95,400	81,000
Crude	360,270	383,230	460,000 ^r	590,000	626,000
Dead-burned	26,010	20,220	20,840	21,900	22,784
Huntite	5,340	15,660	23,220	13,500	12,600
Nitrogen, ammonia, N content	119,000	119,000	75,000	130,000	120,000
Perlite:					
Crude	985,328	890,670	921,410	700,000	764,000
Screened	507,340	625,000 ^r	790,000 ^r	690,000	611,000
Pumice and related minerals:					
Pozzolan, Santorin earth	270,000	153,070	117,010	114,000	92,000
Pumice	429,870	580,960	659,000 ^r	840,000	842,000
Salt, all types	146,402	121,537	158,020	160,000 ^e	160,000 ^e
Sand and gravel, industrial, unspecified	--	75,320	141,500	77,000	80,000
Stone:					
Crushed, limestone	18,109	21,632	25,500	26,000 ^e	26,000 ^e
Dimension, marble ⁴ thousand metric tons	1,600	1,664	1,890	2,172	2,498
Size and shape unspecified:					
Calcium carbonate ^e	414,000	384,000	380,000	400,000	410,000
Olivinite	25,410	23,020	24,890	29,000	33,000
Sulfur, byproduct, mixed sulfide ore, S content	220,000	155,000	190,000 ^r	326,100	395,000

See footnotes at end of table.

TABLE 1—Continued
GREECE: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
MINERAL FUELS AND RELATED MATERIALS					
Coal, lignite thousand metric tons	50,411	46,308	32,675	37,410	36,600
Natural gas thousand cubic meters	5,062	4,379	8,555	8,249	8,200 ^e
Petroleum:					
Crude thousand 42-gallon barrels	514	533	1,272	1,023	1,844
Refinery:					
Distillate fuel oil do.	71,400	77,353 ^r	87,800	80,546	83,200 ^e
Gasoline do.	39,500	39,332 ^r	40,700	45,132	46,600 ^e
Jet fuel do.	17,700	16,500 ^r	15,000	19,278	19,900 ^e
Kerosene do.	8	8	9	--	--
Liquefied petroleum gas do.	8,500	8,155 ^r	9,000	9,709	10,000 ^e
Naphtha do.	11,900	12,092 ^r	14,000	13,284	13,700 ^e
Residual fuel oil do.	40,500	39,221 ^r	45,000	48,563	50,200 ^e
Total do.	190,000 ^r	193,000 ^r	212,000 ^r	217,000	224,000 ^e

^eEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 11, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, copper, dolomite, lignite briquets, manganese, and other crude construction materials may have been produced, but available information was inadequate to make reliable estimates of output.

³Dry bauxite equivalent of crude ore.

⁴Converted from cubic meters to metric tons using a conversion factor of 2.56.

TABLE 2
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, Al ₂ O ₃	Aluminium of Greece S.A. (Mytilineos Holdings S.A., 53%)	Agios Nikolaos, Boeotia area	820
Aluminum	do.	do.	180
Barite, BaSO ₄	Imerys S.A.	Mines at Adamas, Milos Island	NA
Bauxite	Delphi-Distomon S.A. (Mytilineos Holdings S.A.)	Mines at Amfissa and Distomon	650
Do.	Elmin Bauxites S.A. (Imerys S.A.)	Mines at Aga Marina, Lamia	500
Do.	European Bauxites S.A. (Imerys S.A.)	Mines at Amfissa and Distomon, plants at Phocis and Itea	2,000
Cement	Halyps Cement S.A. (HeidelbergCement Group)	Paralia Aspropyrgos plant, Athens	1,000
Do.	Heracles General Cement S.A. (LafargeHolcim Ltd.)	Plant at Volos	4,900
Do.	do.	Plant at Milaki, South Evia	2,200
Do.	TITAN Cement Co. S.A. (TITAN Group)	Kamari plant, West Attica	2,900
Do.	do.	Drepano Achaia plant, Patras	1,900
Do.	do.	Salonica plant, Salonica	1,650
Do.	do.	Elefsis plant, Athens area	400
Do.	do.	Elefsis white cement plant, Athens area	130
Chromite	Financial-Mining-Industrial and Shipping Corp. (FIMISCO)	Tsingeli Mine, Volos	25 ¹
Clay, bentonite:			
Crude	Imerys S.A.	Mines at Adamas, Milos Island	1,000
Do.	Mediterranean Bentonite Co. S.A. (Industria Chimica Mineraria S.p.A.)	Surface mines on Milos Island	20
Do.	Mykobar Mining Co. S.A. (Silver & Baryte Ores Mining Co. S.A.)	Mines at Adamas, Milos Island	300
Do.	do.	Plants at Adamas, Milos Island	200
Processed	Imerys S.A.	Plant at Voudia Bay, Milos Island	900
Coal, lignite	Public Power Corp. S.A.-Hellas (PPC) [Hellenic Corporation of Assets and Participations S.A. (HCAP S.A.), 34.12%; Hellenic Republic Asset Development Fund, 17%; PPC Pension Funds, 3.93%; other investors, 44.95%]	Megalopolis and West Macedonia Mines	50,000
Ferroalloys, ferronickel, Ni content	LARCO G.M.M. S.A. [Government, 55.2%; National Bank of Greece, 33.4%; Public Power Corp. S.A.-Hellas (PPC), 11.4%]	Larymna metallurgical plant	25
Gold:			
Au in concentrate	kilograms Hellas Gold S.A. (Eldorado Gold Corp., 95%, and Aktor, 5%)	Olympias Mine, Halkidiki Peninsula	3,000 ^e
Metal	Nikias Gold S.A.	Athens	NA
Gypsum	Lava Mining and Quarrying Co. S.A.	Altsi, Crete Island	500
Do.	TITAN Cement Co. S.A. (TITAN Group)	do.	280
Huntite and (or) hydromagnesite	Microfine S.A.	Mines in Kozani Basin	100
Lead, Pb in concentrate	Hellas Gold S.A. (Eldorado Gold Corp., 95%, and Aktor, 5%)	Olympias Mine, Halkidiki Peninsula	6 ^e
Do.	do.	Stratoni Mine, Halkidiki Peninsula	10 ^e
Magnesite, concentrate	Grecian Magnesite S.A.	Mine and production facilities at Chalkidiki on Halkidiki Peninsula and in Yerakini	250
Do.	Terna Magnesite (Terna Mag) (Gek Terna Group)	Gerorema Mine, Euboea island	100
Manganese, battery-grade MnO ₂	Eleusis Bauxite Mines Mining, Industrial and Shipping S.A. [National Bank of Greece (OAE)]	Nevrokopi, Drama	10
Natural gas	thousand cubic meters per day Kavala Oil S.A. (Energean Oil and Gas S.A.)	South Kavala gasfield, east of Thassos Island	25 ^e

See footnotes at end of table.

TABLE 2—Continued
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners		Location of main facilities	Annual capacity
Nickel, ore		LARCO G.M.M. S.A. [Government, 55.2%; National Bank of Greece, 33.4%; Public Power Corp. S.A.-Hellas (PPC), 11.4%]		Agios Ioannis Mine, Evia Mine, at Neo Kokkino near Larymna; and Kastoria Mine, near border with Albania	2,500
Nitrogen, N content of ammonia		Phosphoric Fertilizers S.A.		Nea Karvall	150
Perlite		Imerys S.A.		Mines on Milos Islands; plant at Piraeus	650
Do.		Otavi Minen Hellas S.A. (Otavi Minen AG)		Milos Island	150
Petroleum:					
Crude	42-gallon barrels per day	Kavala Oil S.A. (Energean Oil and Gas S.A.)		Prinos offshore oilfield, east of Thassos Island	4,100 °
Do.	do.	do.		Prinos North offshore oilfield, east of Thassos Island	1,100 °
Refined	do.	Hellenic Petroleum S.A.		Aspropyrgos	148,000
Do.	do.	do.		Elefsina	106,000
Do.	do.	do.		Thessaloniki	90,000
Do.	do.	Motor Oil (Hellas) Corinth Refineries S.A.		Aghii Theodori, Corinth	163,000
Pozzolan (Santorin earth)		Lava Mining and Quarrying Co. (Heracles General Cement Co.)		Xylokeratia, Milos Island	600
Do.		TITAN Cement Co. S.A. (TITAN Group)		do.	300
Pumice		Lava Mining and Quarrying Co. (Heracles General Cement Co.)		Yali Island	1,000
Silica, quartz (microcrystalline)		do.		Adamas, Milos Island	150 ²
Silver, Ag in concentrate	kilograms	Hellas Gold S.A. (Eldorado Gold Corp., 95%, and Aktor, 5%)		Olympias Mine, Halkidiki Peninsula	18,000 °
Do.	do.	do.		Stratoni Mine, Halkidiki Peninsula	26,000 °
Steel:					
Raw		Hellenic Halyvourgia		Volos plant	1,000
Do.		Halyvourgiki S.A.		Eleusis plant	1,200
Do.		Hellenic Steel Co. S.A.		Thessaloniki plant	1,000
Do.		Sidenor Steel Products Manufacturing S.A.		Thessaaloniki and Almyros plants	2,800
Products		Corinth Pipeworks S.A. (CPW)		Thisvi plant, Viotia, nears Athens	800
Stone, marble, slab and tile		Aghia Marina Marble Ltd.		Various areas of northern Greece	NA
Do.		Gourlis Group		Quarries at Levadia, Neurokopi, and Tiseo	NA
Do.		Michelakis Marble S.A.		Kavala	NA
Zinc, mine, Zn in concentrate		Hellas Gold S.A. (Eldorado Gold Corp., 95%, and Aktor, 5%)		Olympias Mine, Halkidiki Peninsula	8 °
Do.		do.		Stratoni Mine, Halkidiki Peninsula	14 °

°Estimated. Do., do. Ditto. NA Not available.

¹Inactive since 2013.

²Inactive since 2012.