

2016 Minerals Yearbook

THAILAND

THE MINERAL INDUSTRY OF THAILAND

By Yolanda Fong-Sam

In 2016, Thailand was one of the world's leading producers of gypsum (was the 4th-ranked world producer, with 4% of world production), feldspar (5th-ranked, with 6% of world production), rare earths (5th-ranked, with 1% of world production), barite (8th-ranked, with 3% of world production), and fluorspar (11th-ranked, with almost 1% of world production). Thailand's metal-mining industry produced such metals as antimony, gold, iron and steel, lead, manganese, silver, tin, tungsten, and zinc. In addition, Thailand produced a variety of industrial minerals and mineral products, such as cement, clay, and salt (table 1; Crangle, 2018; Gambogi, 2018; McRae, 2018; Singerling, 2018; Tanner, 2018).

Minerals in the National Economy

In 2016, Thailand's real gross domestic product (GDP) was \$1.2 trillion dollars, which represented a growth rate increase of 3.2% compared with an increase of 2.8% in 2015. Although the GDP increased in 2016, the country's economy faced challenges, such as severe droughts, economic uncertainty, and modest trade, according to the Bank of Thailand. In 2016, about 66,470 people, or less than 1% of the total labor force, were employed in the mining and quarrying industry, which was a 16% decrease compared with the number employed in the industry in 2015. The total foreign direct investment (FDI) in Thailand decreased by about 6% compared with that of 2015, to about \$199.9 billion from \$188.9 billion. FDI in mining and quarry accounted for 1.3% of the total FDI in 2016, and FDI in manufacturing—the sector with the largest share of total FDI—accounted for 45% (Bank of Thailand, 2017, p. 46, 52; 2018a, c; U.S. Central Intelligence Agency, 2018).

Government Policies and Programs

In May, the Government of Thailand issued a resolution that proposed the cessation of gold mining activities by the end of the year. The resolution also indicated that the Government would no longer issue or renew licenses for the mining of gold. On December 13, the National Council for Peace and Order issued Order No. 72/2559, which called for the suspension of gold mining operations and related activities starting on January 1, 2017. The order also included restrictions on the issuing or renewal of gold exploration licenses, mining concessions, and permits for metallurgical processing. All agencies related to the gold industry of Thailand were required to rehabilitate the mining areas according to their environmental impact assessment reports or else face fines or imprisonment; they were also required to provide assistance to people affected by the closure of such mines (Tungsuwan, 2016, 2017).

In December, the Government of Thailand announced that a new mineral bill had passed the National Legislative Assembly and was pending promulgation from the Royal Gazette, after which it would come into effect in 180 days. The new mineral

bill includes the consolidation of the Mineral Act, B.E. 2510 (1967, which was last amended in 2002), and the Mineral Royalty Rates Act, B.E. 2509 (1966, which was last amended in 1979) into one law. The new law also describes changes in the types of prospecting licenses and mining leases that are issued, as well as the validity of periods, and the entities authorized to issue the licenses and leases. The law also establishes the creation of the National Minerals Management Policy Committee, which is tasked with proposing strategies, policies, and mineral management plans and also designating the mineral deposit areas allowed to be mined (Tungsuwan, 2017).

Production

In 2016, the production of most metals increased, including that of silver (71%), gold (30%), and mined tin (28%); also, the production of antimony was restarted. Modest production decreases were reported for tungsten (decreased by 7%) and zinc, gross weight (3%); meanwhile, the production of iron ore decreased to zero. The industrial minerals sector recorded increases in the production of rare-earth oxides (by 111%), travertine (93%), ball clay (43%), fluorspar (33%), barite (31%), dolomite (25%), shale (21%), sand and gravel (industrial, granite) (17%), calcite (13%), and cement (10%); and decreases in the production of quartz (73%), feldspar (12%), perlite (9%), and silica (7%). In the mineral fuels sector, production increased for coal (12%) and crude petroleum (8%) (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities in Thailand. Most of the nonfuel mineral mining and mineral-processing companies in Thailand were privately owned and operated. The Electricity Generating Authority of Thailand (EGAT) and several coal mining companies owned and operated most of the country's major coal exploration and mining businesses. PTT Exploration and Production Public Co. Ltd. (PTTEP) [a subsidiary of state-owned Petroleum Authority of Thailand (PTT)], its joint ventures, and major multinational oil companies owned most of the country's petroleum and natural gas exploration projects and extraction businesses (table 2).

Mineral Trade

In 2016, the value of Thailand's exports increased by 0.5% to approximately \$215.4 billion from \$214.3 billion in 2015. Exports of metal and steel were valued at \$9.2 billion and accounted for 4.3% of Thailand's total exports; nonmonetary gold, \$7.3 billion and 3.4% of total exports; and petroleum products, \$5.6 billion and 2.6% of total exports. Thailand's main export partners were the United States (accounted for 11.4% of the total export value), China (11.0%), and Japan (9.5%) (Bank of Thailand, 2018b, d, e).

In 2016, the value of imports decreased by 4% to about \$194.2 billion from \$202.7 billion in 2015. Thailand's imports of mineral fuels (coal, coke, crude petroleum, natural gas, and petroleum products) decreased in value to about \$23.0 billion from \$29.7 billion in 2015. Fuels accounted for approximately 12% of Thailand's total imports in 2016. The value of imported base metal materials was \$16.3 billion (8.4% of total imports), and the value of imported nonmonetary gold was \$6 billion (3.1% of total imports). Thailand's main import partners in 2016 were, in order of percentage of total imports supplied, by value, China (21.6%), Japan (15.8%), the United States (6.2%), and Malaysia (5.6%) (Bank of Thailand, 2018b, e).

Commodity Review

Metals

Gold and Silver.—Kingsgate Consolidated Ltd. of Australia owned and operated the Chatree gold mine in central Thailand through its subsidiary Akara Resources Public Co. Ltd. In 2016, the company produced about 3,033 kilograms (kg) of gold and 21,013 kg of silver at Chatree. On May 10, the Government of Thailand announced the mandatory closure of the Chatree gold mine by December 31, 2016. The Government did not offer an explanation for the decision but reassured Kingsgate that it was not related to the company's performance in the operation of the mine. On December 31, the Chatree Mine was put on care-and-maintenance status, and the employees were terminated; meanwhile, the company was requesting a justification for the Government's actions (Kingsgate Consolidated Ltd., 2016, p. 5, 8; Swanepoel, 2016).

Zinc.—Padaeng Industry Public Co. Ltd. (PDI) was engaged in mining, milling, and smelting zinc and producing zinc alloys in Thailand. Padaeng owned and operated the Mae Sod Mine, which was the only zinc mine in Thailand. The Mae Sod Mine is located in the Mae Sod district of Tak Province, Padaeng's smelter was located in the Muang district of Tak Province, and its roaster plant was located in Rayong Province. In June 2016, after 32 years of operation, the Mae Sod Mine completed its last zinc ore and concentrate production, which were then sent for final refining. The mine ceased operations owing to depletion of reserves. PDI's plan after the closure of the mine was to restore the property into a natural forest and release the land to the Royal Forest Department by 2017. The roaster plant ceased operations at the end of 2016. By the end of 2017, the company planned to cease all operations related to the zinc business in Thailand (Padaeng Industry Public Co. Ltd., 2017, p. 8, 13, 25–26).

Industrial Minerals

Cement.—In 2016, a total of seven cement companies operated 12 plants in Thailand with a total production capacity of 60 million metric tons per year of cement. In 2016, the Thailand Cement Manufacturers Association reported total production 39.94 million metric tons (Mt) of cement, which was up by 10.3% from the 36.22 Mt produced in 2015 (Thailand Cement Manufacturers Association, 2016, p. 9).

Mineral Fuels

Coal, Natural Gas, and Petroleum.—In 2016, Thailand's primary commercial energy consumption was about 2.1 million barrels of oil equivalent per day. The distribution of total consumption was natural gas, 43%; petroleum products, 38%; coal and lignite, 17%; and other, 2%. In 2016, the country imported a total of 57% of its energy requirement. The remaining 43% of its energy requirement was produced domestically and included natural gas, 70%; crude petroleum, 19%; and condensate, 11% (Ministry of Energy, 2016, p. 30–31).

Outlook

According to the Bank of Thailand, the country's economy is expected to have steady growth in 2017; exports are expected to increase in line with the economies of its trading partners; and public spending and consumption are also expected to increase. Uncertainties in the gold and zinc industries are expected in the near future as a result of the Government's resolution to require the stoppage of all gold mining activities by the end of 2016 and because of the depletion of the Mae Sod zinc mine (Bank of Thailand, 2017, p. 11, 46–47, 51).

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TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

| Commodity ² | 2012 | 2013 | 2014 | 2015 | 2016 |
|--|------------------------|------------------------|----------------------|---------------------|---------------------|
| METALS | | | | | |
| Antimony: | | | | | |
| Mine production, Sb content | 43 | -- | -- | -- | 32 |
| Refinery production, metal | -- ^r | 488 | 706 | 700 ^c | 700 ^c |
| Copper, refinery production | 721 | -- | 229 | -- | -- |
| Gold, mine production, Au content kilograms | 4,895 | 4,419 | 4,514 ^r | 3,305 | 4,293 |
| Iron and steel, raw steel thousand metric tons | 3,328 | 3,578 | 4,095 ^r | 3,720 ^r | 3,824 |
| Iron ore, mine production: | | | | | |
| Gross weight | 303,233 | 389,620 | 347,918 | 16,483 | -- |
| Fe content | 188,000 ^r | 242,000 ^r | 216,000 ^r | 10,200 ^r | -- |
| Lead, refinery production, secondary | 86,507 | 87,385 | 79,250 | 86,000 ^r | 90,000 ^c |
| Manganese, mine production: | | | | | |
| Gross weight | 8,151 | 14,320 | 14,330 | 9,000 | 9,150 |
| Mn content, 46% to 50% Mn | 3,830 | 6,730 | 6,900 | 4,300 | 4,400 |
| Silver, mine production, Ag content kilograms | 32,047 | 32,381 | 31,046 | 21,047 | 35,954 |
| Tin: | | | | | |
| Mine production, mineral concentrate, Sn content | 199 | 132 | 156 | 72 | 92 |
| Smelter production, primary | 19,996 | 19,088 | 16,929 | 10,502 ^r | 11,088 |
| Tungsten, mine production, concentrate: | | | | | |
| Gross weight | 133 | 252 | 173 | 61 | 57 |
| W content ^c | 80 | 140 | 100 | 30 | 30 |
| Zinc: | | | | | |
| Mine production, ore: | | | | | |
| Gross weight | 166,642 | 172,578 | 226,893 | 181,025 | 175,632 |
| Zn content | 29,000 ^{r, c} | 29,300 ^{r, c} | 39,140 | 29,000 ^c | 30,000 ^c |
| Alloys, Zn content ^c | 30,400 | 23,000 | 19,700 ^r | 22,200 ^r | 22,000 |
| Smelter production, primary | 97,000 | 78,000 ^{r, c} | 70,100 ^r | 74,121 ^r | 72,813 |
| INDUSTRIAL MINERALS | | | | | |
| Barite | 64,499 | 107,437 | 134,961 | 170,621 | 223,101 |
| Cement, hydraulic thousand metric tons | 31,760 | 35,854 | 34,980 | 36,216 | 39,940 |
| Clay and shale: | | | | | |
| Ball clay | 447,348 | 112,187 | 123,082 | 81,245 | 116,203 |
| Bentonite | 30,000 ^r | 150 | -- | -- | -- |
| Kaolin: | | | | | |
| Beneficiated | 141,764 | 119,512 | 124,094 | 102,763 | 101,443 |
| Filler | 300 | -- | -- | -- | -- |
| Nonbeneficiated | 1,000,975 | 631,133 | 755,913 | 655,196 | 681,630 |
| Shale, for cement thousand metric tons | 4,755 | 4,307 | 5,409 | 6,277 | 7,578 |
| Diatomite | 8,500 | -- | -- | -- | -- |
| Feldspar, mine production | 1,100,723 | 1,072,656 | 1,413,428 | 1,331,916 | 1,167,147 |
| Fluorspar | 9,602 | 2,432 ^r | 4,590 ^r | 15,095 ^r | 20,100 |
| Gypsum thousand metric tons | 11,447 | 12,383 | 12,445 | 11,267 | 10,902 |

See footnotes at end of table.

TABLE 1—Continued
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

| Commodity ² | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|----------------------|-----------|----------------------|------------------------|----------------------|
| INDUSTRIAL MINERALS—Continued | | | | | |
| Lime ^c | 800,000 | 800,000 | 800,000 | 780,000 | 780,000 |
| Perlite | 41,400 | 14,293 | 54,100 | 17,200 | 15,690 |
| Phosphate rock: | | | | | |
| Crude | 1,990 | 350 | 500 | -- | -- |
| P ₂ O ₅ content | 600 | 100 | 150 | -- | -- |
| Rare earths: | | | | | |
| Mineral concentrate, rare-earth-oxide equivalent | 120 | 130 | 1,900 | 760 | 1,600 |
| Monazite concentrate ^c | 200 | 210 | 3,200 | 1,300 | 2,600 |
| Salt | 1,363,539 | 1,300,156 | 1,381,067 | 1,385,911 | 1,390,548 |
| Stone, sand, and gravel: | | | | | |
| Sand and gravel, industrial, granite thousand metric tons | 6,347 | 7,068 | 7,591 | 8,075 | 9,459 |
| Silica, mine production, unspecified | 434,094 | 876,085 | 1,083,174 | 1,191,612 | 1,102,699 |
| Stone, crushed: | | | | | |
| Dolomite | 2,608,997 | 2,487,135 | 2,471,486 | 2,432,853 ^r | 3,034,860 |
| Limestone thousand metric tons | 150,120 | 161,440 | 165,513 | 176,626 ^r | 174,208 |
| Marl, for cement | 100,000 | 75,500 | 1,200 | -- | -- |
| Stone, dimension: | | | | | |
| Calcite | 865,800 | 841,746 | 991,981 | 1,281,765 | 1,452,235 |
| Granite | 14,808 | 7,936 | 8,005 | 13,878 | 14,860 |
| Marble, including fragments | 798,308 | 1,260,465 | 1,664,978 | 2,661,207 | 2,599,875 |
| Travertine | 900 | -- | 5,103 | 1,350 | 2,600 |
| Quartz | 404,800 | 393,791 | 194,831 | 188,650 | 50,160 |
| Talc and related materials: | | | | | |
| Pyrophyllite | 35,000 | 26,820 | 49,100 | 45,500 | 40,000 ^c |
| Talc | 5,856 | 7,880 | 8,208 | 6,768 | 7,126 |
| MINERAL FUELS AND RELATED MATERIALS | | | | | |
| Coal, lignite thousand metric tons | 18,069 | 18,111 | 17,991 | 15,151 ^r | 16,979 |
| Natural gas: | | | | | |
| Condensate thousand 42-gallon barrels | 21,169 | 33,273 | 34,430 | 34,844 | 35,472 |
| Gross production million cubic meters | 21,766 | 41,797 | 42,118 | 33,460 ^r | 33,586 |
| Petroleum: | | | | | |
| Crude thousand 42-gallon barrels | 37,164 | 54,561 | 50,647 | 55,699 ^r | 59,927 |
| Refinery production do. | 229,000 ^c | 369,713 | 287,784 ^r | 301,331 ^r | 302,000 ^c |

^cEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through February 28, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, gemstones and silicon may have been produced in Thailand, but available information was inadequate to make reliable estimates of output.

TABLE 2
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|--|------------------------------------|---|---|--------------------|
| Antimony | metric tons | Amco Thai Mining Co. (Hibino Metal Industry) | Antimony smelter, Ban Pin, Phrae Province | 555 |
| Barite | | Asian Mineral Resources Co. Ltd. | Loei, Mae Hong Son, Nakhon Si Thammarat, and Satun Provinces | 60 |
| Do. | | P&S Barite Mining Co. Ltd. | Loei and Nakhon Si Thammarat Provinces | 60 |
| Cement | | Asia Cement Public Co. Ltd. | Saraburi Plant, Phra Phutthabat District, Saraburi Province | 4,992 |
| Do. | | Globe Cement Co. Ltd. | Saraburi Plant, Chalerm Phrakiat District, Saraburi Province | 845 |
| Do. | | Jalaprathan Cement Public Co. Ltd. (Cement Francais S.A., 37%; Veatprapat Holding Co. Ltd., 19%; others, 44%) | Takli Plant, Takli District, Nakhon Sawan Province | 1,152 |
| Do. | | do. | Cha-Am Plant, Cha-Am District, Petchaburi Province | 1,190 |
| Do. | | Siam City Cement Public Co. Ltd. (Holcim Ltd., 27.5%; Rattanak family, 27%; other investors, 45.5%) | Kaeng Khoi District, Saraburi Province | 14,784 |
| Do. | | TPI Polene Public Co. Ltd. | do. | 13,000 |
| Do. | | Siam Cement (Ta Luang) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.) | Ta Luang Plant, Ban Mo District, Saraburi Province | 3,072 |
| Do. | | do. | Khao Wong Plant, Praputtabath District, Saraburi Province | 3,840 |
| Do. | | Siam Cement (Kaeng Khoi) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.) | Kaeng Khoi District, Saraburi Province | 7,296 |
| Do. | | Siam Cement (Thung Song) Co. Ltd. (SCG Cement-Building Materials Co. Ltd.) | Thung Song District, Nakorn Sri Thammarat | 6,912 |
| Do. | | Siam Cement (Lampang) Co. Ltd. (SCG (SCG Cement-Building Materials Co. Ltd.) | Chaehom District, Lampang Province | 2,112 |
| Do. | | Thai Pride Cement Co. Ltd. | Saraburi Plant, Kaeng Khoi District, Saraburi Province | 960 |
| Coal, lignite | | Electricity Generating Authority of Thailand (EGAT) (Government, 100%) | Mae Moh, Lampang Province | 20,000 |
| Do. | | Lanna Resources Public Co. Ltd. | Ban Pakha, Lamphun Province | 1,000 |
| Copper, refined | | Thai Copper Industries Public Co. Ltd. (TCI) | Rayong Industrial Park, Rayong Province | NA |
| Feldspar, concentrate | | Asia Mineral Processing Co. Ltd. | Provinces of Nakhon Si Thammarat | 500 |
| Fluorspar, concentrate | | do. | Mae Hong Son Province | 14 |
| Gas, natural | million cubic meters per day | Esso Exploration and Production Khorat Inc. | Namphong, Khon Kaen Province | 4 |
| Do. | do. | TOTAL Exploration and Production (Thailand) | Bongkot, offshore in the Gulf of Thailand | 15 |
| Do. | do. | Chevron Corp. | Baanpot, Erawan, Funan, Kaphong, Pladang, Satun, Pailin, Trat, all offshore in the Gulf of Thailand | 33 |
| Do. | do. | do. | Platong II project | NA |
| Gold, mine output, Au content ¹ | kilograms | Akara Resources Public Co. Ltd. (Kingsgate Consolidated Ltd., 100%) | Chatree, Phichit Province | 5,000 |
| Gypsum | | Vanich Gypsum Co. Ltd. | Khlong Prab, Mai Rieng. Thoong Yai Mai in Nakhon Si Thammarat and Surat Thani Provinces | 8,500 |
| Do. | | Siam Cement Group | NA | NA |
| Do. | | Lotus Mines Co. Ltd. | Nakornsawan | NA |
| Do. | | General Mining and Trading Co. Ltd. | Talad, Muang | NA |
| Iron ore, gross weight ² | | P.T.K. Mining Co. Ltd. | Phu Ang, Loei Province | 720 |
| Lead, in concentrate | | Kanchanaburi Exploration and Mining Co. Ltd. | Song Toh, Nong Phai, and Bo Ngam in Kanchanaburi Province | 55 |

See footnotes at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity |
|---|--|--|---|--------------------|
| Petroleum, crude, including condensate | thousand 42-gallon barrels per day | Chevron Corp. | Benjamas, Tantanwan, offshore in the Gulf of Thailand | 35 |
| Do. | do. | do. | Baanpot, Erawan, Funan, Gomin, Jakrawan, Kaphong, Pailin, Platon, Satun, Surat, Trat Plamuk, offshore in the Gulf of Thailand | 38 |
| Do. | do. | PTT Exploration and Production Public Co. Ltd. [Petroleum Authority of Thailand (Government, 100%)] | Arthit, Songkhla, Gulf of Thailand | 20 |
| Do. | do. | Thai Shell Exploration and Production Co. Ltd. | Sirikit in Kamphaenghet Province | 24 |
| Do. | do. | TOTAL Exploration and Production (Thailand) | Bongkot, offshore in the Gulf of Thailand | 12 |
| Silicon, metal (gross weight) | metric tons | G.S. Energy Co., Ltd. | Ratchaburi silicon plant | 25,000 |
| Silver, mine output, Ag content ¹ | kilograms | Akara Resources Public Co. Ltd. (Kingsgate Consolidated Ltd., 100%) | Chatree, Phichit Province | 31,000 |
| Steel, rolled | | The Bangkok Iron and Steel Works Co. Ltd. | Phrapradaeng, Samutprakarn Province | 120 |
| Do. | | Bangkok Steel Industry Public Co. Ltd. | do. | 300 |
| Do. | | Tata Steel (Thailand) Plc (Tata Steel Ltd., 67.9%; McDonald Investment, 6.5%; other investors, 25.6%) | Map Ta Phut, Rayong Province; Sriracha, Chonburi Province; Ban Mon, Saraburi Province | 1,700 |
| Do. | | Namheng Steel Co. Ltd. | Lopburi Province | 300 |
| Do. | | Sahaviriya Group Corp. Ltd. | Bang Saphan, Prachuap Khiri Khan Province | 2,400 |
| Do. | | Siam United Steel Co. Ltd. | Rayong Province | 1,000 |
| Do. | | G-Steel Plc (formerly Siam Ystrip Mill Plc) | Bann Khai, Rayong Province | 600 |
| Steel, rebar | | TY Steel Co. (Tycoons Group International Co. Ltd.) | Wire rod and rebar plant, Rayong Province | 180 |
| Tantalum, metal powder and oxides | metric tons | H.C. Starck (Thailand) Co. Ltd. (H.C. Starck GmbH, 94.98%, and others, 5.02%) | Map Ta Phut, Rayong Province | 250 |
| Tin: | | | | |
| Concentrate, Sn content | | Numerous small companies | Nakhon Si Thammarat, Phangnga, Phuket, and Rayong Provinces | 3 |
| Refined | | Thailand Smelting & Refining Co. Ltd. (Thaisarco) (Amalgamated Metal Corp. Group, 77.1%, and other, 22.9%) | Phuket, Phuket Province | 30 |
| Tungsten, in concentrate | metric tons | SC Mining Co. Ltd. (Som Chai family, 100%) | Ban Pin, Phrae Province | 650 |
| Zinc: | | | | |
| In concentrate ² | | Padaeng Industry Public Co. Ltd. (Bali Ventures Ltd., 21.7%; Thai Ministry of Finance, 13.81%; RAK Minerals & Metals Investments, 12.5%; others, 52%) | Mae Sod district, Tak Province | 65 |
| Refined | | do. | Smelter in Muang district, Tak Province; roaster plant, Rayong Province | 115 |

Do., do. Ditto. NA Not available.

¹Mine was in care-and-maintenance status in 2016.

²Mine was shut down in 2016.