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The Mineral Industry of Thailand

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In 2015, Thailand's real growth rate of the gross domestic product (GDP) increased by 2.8% compared with a growth rate of 0.8% in 2014. Thailand remained under martial law for the first quarter of 2015 following the May 22, 2014, military takeover of the Government that was launched by the Royal Thai Armed Forces. In April, the military junta announced a repeal of martial law; however, the junta remained in power through 2015. The Bank of Thailand reported Thailand's unemployment rate in 2015 as 0.9% of the total workforce, which was up from 0.8% in 2014. Economic recovery remained slow following the political uncertainty of 2014 and 2015 and the low prices of exports, which resulted in low levels of manufacturing (Lefevre, 2015; Bank of Thailand, 2016a, p. 27, 31; 2016d, p. 3).

In 2015, Thailand was one of the world's leading producers of feldspar (7% of world production), and gypsum (5%). Thailand produced such metals as copper, gold, iron ore, manganese, silver, tin, tungsten, and zinc. Thailand also produced a variety of industrial minerals, such as barite, clays, and salt (table 1; Crangle, 2017; Tanner, 2017).

Minerals in the National Economy

In 2015, about 79,230 people, or 0.21% of the total labor force, were employed in the mining and quarrying industry, which was a 15% increase from that of 2014. The total foreign direct investment (FDI) in Thailand increased by 79% compared with that of 2014, reaching a value of $8.9 billion; however, the level of FDI was still well below the values for 2013 and 2012. FDI in mining and quarrying increased by 167% compared with that of 2014 and accounted for 5.6% of the total FDI in 2015. FDI in manufacturing decreased by 33% but continued to make up the largest share of FDI, accounting for 36% in 2015; in 2014, manufacturing had accounted for 95% of the total FDI, whereas mining and quarrying accounted for only 3.4% (Bank of Thailand, 2016b).

Government Policies and Programs

In April, the Government released the Thailand Mining Fiscal Regime H2 2015 report. The report outlines the governing bodies, laws, licenses, rights obligations, and tax-related information for coal, copper, gold, iron ore, and silver. Thailand's mining industry is governed by the Ministry of Energy (MOE), Ministry of Industry (MOI), and the Ministry of Natural Resources and Environment (MONRE). The Department of Primary Industries and Mines (DPIM), which is under the MOI, oversees, supervises, promotes, and supports mining and metallurgical activities to fulfill the demand for sustainable use of Thailand's mineral resources while providing for public safety and protecting the environment in compliance with the Mineral and Petroleum Resources Development Act as amended in 2014. The DPIM also provides technical assistance to the metallurgical, mineral-processing, and mining industries. The Department of Mineral Fuels, which is under the MOE, oversees Thailand's petroleum industry and promotes the development of the country's domestic petroleum supply. The Department of Mineral Resources (DMR), which is under the MONRE, drafts national mineral policies and provides technical assistance for geologic prospecting and mineral exploration. The DMR conducts geologic mapping, manages mineral resources, performs mineral analyses, and administers the country's mineral resources information center (Department of Primary Industries and Mines, 2014; Department of Energy, 2016; Wood, 2016).

Production

In 2015, Thailand's production of most metals decreased, including major decreases in the production of iron ore, by 95%; tungsten content in concentrate, 70%; tin content in concentrate, 54%; manganese ore (Mn content), 38%; mine output of silver (Ag content), 32%; mine output of gold (Au content), 28%; and zinc ore (Zn content), 26%. In the industrial minerals sector, production increases included that for granite, by 73%; marble, 60%; calcite, 29%; barite, 26%; fluorspar, 25%; and shale, 16%. Industrial minerals for which production decreased included travertine stone, 74%; perlite, 68%; ball clay, 34%; and talc, 18%. Natural gas production decreased by about 16%, whereas production of crude petroleum increased by 10% (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 county's major coal exploration and mining businesses. The PTT Exploration and Production Public Co. Ltd. (PTTEP), which was a subsidiary of state-owned Petroleum Authority of Thailand (PTT), and 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 2015, Thailand's exports decreased in value to about $214 billion from $228 billion in 2014, or by 5.6%. The value of imports decreased to nearly $203 billion in 2015 from $228 billion in 2014, or by 11%. Exported petroleum products were valued at $8.2 billion and accounted for 3.8% of Thailand's total exports. Metal exports, which included aluminum, copper, iron, and steel, were valued at $9.2 billion and represented 4.3% of Thailand's total exports in 2015. Exports of nonmonetary gold were valued at $3.9 billion, which

represented about 1.8% of total exports. Thailand's main export partners in 2015 were the United States (accounted for 11% of Thailand's total export value), China (11%), Japan (9%), and Hong Kong (6%) (Bank of Thailand, 2016e, f).

Thailand's imported fuels (coal, coke, crude petroleum, natural gas, and petroleum refinery products) in 2015 were valued at $29.7 billion, which was down from $47.5 billion in 2014. Fuels accounted for 15% of Thailand's total imports in 2015. Imported base-metal materials were valued at $16.4 billion, or 8.1% of total imports, and imported nonmonetary gold was valued at $7.2 billion, or 3.6% of total imports. This was a 16% decrease in the import value of base-metal materials compared with that of 2014, and a 9.4% increase in the import value of nonmonetary gold. Thailand's main import partners in 2015 were China (accounted for 20% of Thailand's total imports, by value), Japan (15%), the United States (6.8%), Malaysia (5.9%), and the United Arab Emirates (4%) (Bank of Thailand, 2016c, f).

Commodity Review

Metals

Gold and Silver.—Kingsgate Consolidated Ltd. of Australia owned and operated the only gold mine in the country—the Chatree gold mine in central Thailand—through its subsidiary Akara Resources Public Company Ltd. In fiscal year 2015 (July 1, 2014, to June 30, 2015), the company produced about 3,890 kilograms (kg) of gold and 26,400 kg of silver at Chatree. As of June 2015, the company measured the proven and probable reserves at Chatree as 43.5 million metric tons (Mt) of ore at an average grade of 0.80 gram per metric ton (g/t) gold and 8.6 g/t silver. On January 13, the Department of Primary Industry and Mining issued a temporary suspension notice to Chatree owing to reports of elevated levels of arsenic and manganese affecting local inhabitants. Operations at the mine were suspended for a total of 44 days in 2015, and the company stated that the shutdown deferred the production of 470 kg of gold (Cochrane, 2016; Kingsgate Consolidated Ltd., 2016, p. 8–9, 18, 22).

Zinc.—Padaeng 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. The Mae Sod Mine was expected to be depleted of zinc ore in 2016, and the company planned to cease all zinc operations by 2017. Padaeng implemented its mine closure plan in 2015, which entailed acquiring topsoil for use in rehabilitation efforts in 2016. The mine closure plan was expected to continue until 2021, after which time the company was to release the area to the Royal Forestry Department (Padaeng Industry Public Co. Ltd., 2016, p. 48).

Industrial Minerals

Cement.—In 2015, a total of 7 cement companies operated 12 plants in Thailand with a combined production of about 36 Mt of cement. TPI Polene Public Co. Ltd. continued with construction of a fourth cement production line at its plant in Kaeng Koei, Saraburi, which would bring the company's total annual cement capacity up to 13.5 Mt; construction was expected to be completed in early 2016 (Thailand Cement Manufacturers Association, 2016, p. 7; TPI Polene Public Co. Ltd., 2016, p. 186).

Mineral Fuels

Coal, Natural Gas, and Petroleum.—In 2015, as its primary energy source, Thailand consumed about 2.6 million barrels per day (Mbbl/d) of oil equivalent, which was an increase of 1.8% from that of 2014. In 2015, Thailand's domestically produced primary energy totaled 1.5 Mbbl/d of oil equivalent, and its primary energy imports totaled 1.3 Mbbl/d. In 2015, about 135 million cubic meters per day of natural gas was consumed in Thailand, which was an increase of about 2% compared with that of 2014. About 60% of the natural gas consumed went towards the production of electricity. Thailand consumed 15.1 Mt of lignite in 2015, which was down by 17.8% compared with that of 2014. The decrease in lignite consumption was owing to a decrease in electricity generation at the Mae Moh and the Hongsa powerplants, which are located in Lampang and Sainyabuli Provinces, respectively (Ministry of Energy, 2016a, b).

In 2015, Alstom S.A. of France and Marubeni Corp. of Japan signed an agreement with the Electricity Generating Authority of Thailand to build a new unit at the Mae Moh powerplant to replace units 4 through 7. Construction of the unit was expected to be completed in 2018 and to have a capacity of 600 megawatts (Alstom S.A., 2016).

Outlook

Political uncertainty continued to have an effect on overall growth in Thailand's economy, investment, and trade sectors in 2015. Although Thailand's GDP did expand by 2.8% in 2015, the value of Thailand's exports decreased by 5.6%. Thailand's economic recovery will be greatly dependent on the establishment of a permanent Government and reestablishment of business and investment ties between the private sector and the Government. According to the Bank of Thailand, the economy will continue to recover in 2016 following the political turmoil that began in 2014; however, the economy was at risk from the slowdown of China's economy, weak agricultural prices, and decreases in farm income and domestic consumption owing to the 2015 drought. The future of the Chatree Mine (the country's only gold mine) remained uncertain following the temporary suspension of operations early in 2015. Thailand's only zinc mine is expected to cease operations in 2017 owing to depletion of ore. There were no major metal exploration projects being pursued in Thailand during 2015, and no projects were announced for 2016. According to the MOE, primary energy consumption will continue to increase in 2016 owing to the continued economic recovery. Imports of primary electricity were expected to increase by 32% in 2016 to meet growing consumption (Bank of Thailand, 2016a, p. 6; Ministry of Energy, 2016a).

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TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2011	2012	2013	2014	2015
METALS						
Antimony:						
Ore, gross weight		25	28	--	--	--
Metal, smelter		500 e	672	488	706	700 e
Copper, metal, refined, secondary		525	721	203	229	--
Gold, mine output, Au content	kilograms	2,860	4,895	4,419	4,576	3,305
Iron and steel:						
Iron ore:						
Gross weight		489,359	303,233	389,620	347,918	16,483
Fe content		240,000	149,000	191,000	170,500	8,080
Crude steel	thousand metric tons	4,238	3,328	3,578	3,500 e	3,500 e
Lead, metal, secondary		93,000 e	86,507	87,385	79,250	80,000 e
Manganese ore:						
Metallurgical grade, gross weight, 46% to 50% MnO_2		398	8,151	14,320	14,330	9,000
Mn content		187	3,830	6,730	6,900	4,300 e
Rare earths:						
Monazite		4,500	3,500	1,400	3,800 r	3,600
Rare-earth oxide		2,500	1,900	800	2,100 r	2,000
Silver, mine output, Ag content	kilograms	19,456	32,047	32,381	31,046	21,047

See footnotes at end of table.

TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2011	2012	2013	2014	2015
METALS—Continued						
Tin:						
Concentrate, Sn content		286	199	132	156	72
Metal, primary		20,000 e	19,996	19,088	16,929	8,000 e
Tungsten concentrate:						
Gross weight		292	133	252	173	61
W content		160	80	140	100	30
Zinc:						
Ore:						
Gross weight		148,391	166,642	172,578	226,893	181,025
Zn content		29,664	31,000	30,000	39,140	29,000 e
Metal, primary		103,366	97,000	76,576	65,694	74,000 e
Alloy, Zn content[e]		35,163 [3]	30,400	23,000	20,000	20,000
INDUSTRIAL MINERALS						
Barite		67,703	64,499	107,437	134,961	170,621
Cement, hydraulic	thousand metric tons	30,290	31,760	35,854	34,980	36,216
Clay:						
Ball clay		425,048	447,348	112,187	123,082	81,245
Bentonite		55,220	141,000	150	--	--
Kaolin, marketable:						
Beneficiated, washed		163,881	141,764	119,512	124,094	102,763
Nonbeneficiated, unwashed		932,326	1,000,975	631,133	755,913	655,196
Filler		4,329	300	--	--	--
Diatomite		38,130	8,500	--	--	--
Feldspar		1,041,152	1,100,723	1,072,656	1,413,428	1,331,916
Fluorspar, crude, metallurgical grade		5,093	9,602	15,000 e	40,000 e	50,000 e
Gypsum	thousand metric tons	10,994	11,447	12,383	12,445	11,267
Perlite		26,500	41,400	14,293	54,100	17,200
Phosphate rock, crude		3,300	1,990	350	500	--
Salt, rock		1,359,493	1,363,539	1,300,156	1,381,067	1,385,911
Sand, silica, glass		221,721	434,094	876,085	1,083,174	1,191,612
Stone:						
Calcite		786,250	865,800	841,746	991,981	1,281,765
Dolomite		2,556,765	2,608,997	2,487,135	2,471,486	2,302,592
Granite:						
Dimension	cubic meters	5,267	5,505	2,950	2,976	5,159
Industrial rock	thousand metric tons	5,648	6,347	7,068	7,591	8,075
Limestone	do.	145,573	150,120	161,440	165,513	175,740
Marble, dimension stone and crushed	cubic meters	509,237	311,839	492,369	650,382	1,039,041
Marl for cement manufacture only		65,000	100,000	75,500	1,200	--
Quartz		152,576	404,800	393,791	194,831	188,650
Shale for cement manufacture only	thousand metric tons	4,593	4,755	4,307	5,409	6,277
Travertine		900	900	--	5,103	1,350
Talc		2,304	5,856	7,880	8,208	6,768
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	21,327	18,069	18,111	17,991	17,100
Natural gas, gross production	million cubic meters	29,059	21,766	41,797	42,118	35,448
Petroleum:						
Crude	thousand 42-gallon barrels	50,976	37,164	54,561	50,647	55,823
Natural gas condensate	do.	30,693	21,169	33,273	34,430	34,844
Refinery products[e]	do.	229,000	229,000	369,713 [3]	362,199 [3]	360,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through July 18, 2016.

[2]In addition to the commodities listed, Thailand produced gemstones, pyrophyllite, and silicon, but available information was inadequate to make reliable estimates of output.

[3]Reported figure.

Sources: Department of Mineral Resources, Mineral Statistics of Thailand; Department of Primary Industries and Mines; Ministry of Energy, and Energy Policy and Planning Office.

TABLE 2
THAILAND: 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	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 Province	60
Cement		Asia Cement Public Co. Ltd.	Phra Phutthabat District, Saraburi Province	4,992
Do.		CEMEX (Thailand) Co. Ltd.	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 District, Nakhon Sawan Province	1,152
Do.		do.	Cha-Am District, Petchaburi Province	1,190
Do.		Siam City Cement Public Co. Ltd. (Holcim Ltd., 27.5%; Rattanarak family, 27%; other investors, 45.5%)	Kaeng Koei District, Saraburi Province	14,784
Do.		TPI Polene Public Co. Ltd.	do.	13,000
Do.		Siam Cement (Ta Luang) Co. Ltd. (subsidiary of 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.		do.	Kaeng Khoi District, Saraburi Province	7,296
Do.		Siam Cement (Thung Song) Co. Ltd. (subsidiary of SCG Cement-Building Materials Co. Ltd.)	Thung Song District, Nakorn Sri Thammarat	6,912
Do.		Siam Cement (Lampang) Co. Ltd. (subsidiary of SCG Cement-Building Materials Co. Ltd.)	Chaehom District, Lampang Province	2,112
Do.		Thai Pride Cement Co. Ltd.	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 Punlic Co. Ltd.	Ban Pakha, Lamphun Province	1,000
Copper		Thai Copper Industries Public Co. Ltd. (TCI)	Rayong Industrial Park, Rayong Province	165
Feldspar, concentrate		Asia Mineral Processing Co. Ltd.	Provinces of Nakhon Si Thammarat	500
Fluorspar, concentrate		do.	Mae Hong Son Province	14
Gold	kilograms	Akara Mining Public Company Ltd. (Kingsgate Consolidated Ltd., 100%)	Chatree, Phichit Province	5,000
Gypsum		Vanich Gypsum Co. Ltd.	Khlong Prab, Mai Riang. Thoong Yai Mai in Provinces of Nakhon Si Thammarat and Surat Thani	8,500
Do.		Siam Cement Group	NA	NA
Do.	thousand square meters	Thai Gypsum Products Public Co. Ltd.	NA	75,000
Do.		Lotus Mines Co. Ltd.	Nakornsawan	NA
Do.		General Mining and Trading Co. Ltd.	Talad, Muang	NA
Iron ore, gross weight		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
Natural gas	million cubic meters per day	Esso Exploration and Production Khorat Inc.	Namphong, Khon Kaen Province	4
Do.	do.	TOTAL Exploration and Production (Thailand)	Bongkot in the Gulf of Thailand	15
Do.	do.	Chevron Corp.	Baanpot, Erawan, Funan, Kaphong, Pladang, Satun, Pailin, Trat, all in the Gulf of Thailand	33
Do.	do.	do.	Platong II project	NA
Petroleum, crude, including condensate	thousand 42-gallon barrels per day	do.	Benjamas, Tantawan, 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

See footnotes at end of table.

TABLE 2—Continued
THAILAND: 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	Annual capacity
Silicon, metal (gross weight)	metric tons	G.S. Energy Co., Ltd.	Ratchaburi silicon plant	25,000
Silver, mine output, Ag content	kilograms	Akara Mining 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. (a subsidiary of Tycoons Group International Co. Ltd.)	Wire rod and rebar plant in 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		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 in Rayong Province	115

Do., do. Ditto. NA Not available.