



2011 Minerals Yearbook

THAILAND

THE MINERAL INDUSTRY OF THAILAND

By Lin Shi

Thailand is one of the world's leading producers of cement, feldspar, gypsum, and tin. The identified mineral resources were being produced for domestic consumption and for export (Carlin, 2012; Crangle, 2012; Tanner, 2012; U.S. Department of State, 2012; van Oss, 2012).

Minerals in the National Economy

The growth rate of the gross domestic product (GDP) of Thailand in 2011 was 0.1% compared with 7.8% in 2010; the decrease in the rate of growth was the result of flooding, which was the worst that the county had encountered in 70 years. The unemployment rate was 0.7%, which was a decrease from the 1.0% rate of unemployment in 2010. The inflation rate increased to 3.8% from 3.3% in 2010. Thailand's mining and quarrying sector was important to the country's economy, but it was not a significant contributor to the GDP (Bank of Thailand, 2012b, p. 9).

Government Policies and Programs

The Government stimulus package helped move the country's economy to positive growth in 2010, and the Thai economy continued to experience strong growth in the first three quarters of 2011 until the flooding in the fourth quarter. By the fourth quarter of 2011, inflationary pressure had increased, and stimulus based on fiscal and monetary policy had become less necessary. The Government had cut the budget, decreased spending, and increased revenue collection, which together had lessened the stimulus's effect on the economy (Bank of Thailand, 2012b, p. 7–8).

The Ministry of Industry is the principal Government agency that oversees the country's mining sector. The Ministry's Department of Primary Industry and Mines (DPIM) administers the Minerals Act and issues mining regulations. The DPIM also provides technical assistance to the metallurgical, mineral processing, and mining industries. The Department of Mineral Resources (DMR) 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, promotes environmental geology, and administers the mineral resources information center (Department of Mineral Resources, 2012).

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 Petroleum Authority of Thailand (PTT), PTT Exploration and Production Public Company Ltd. (PTTEP) and its joint ventures, and major multinational oil companies owned

most of the country's petroleum and natural gas exploration projects and exploitation businesses. Thailand's mineral industry was engaged in mining and processing metallic and industrial minerals and exploring for crude oil and natural gas (table 2).

Mineral Trade

Thailand is a member of the World Trade Organization, and trade is important to the country's economy. The value of Thailand's exports increased by 9.5% in 2011 compared with an increase of 14.7% in 2010. The value of imports increased by 13.6% in 2011 compared with an increase of 21.5% in 2010. In 2011, the United States exported goods valued at \$10.9 billion to Thailand, which included semiconductors valued at \$1.5 billion; nonmonetary gold, \$1,206 million; steelmaking materials, \$369 million; and petroleum products, \$337 million. Thailand's exports to the United States were valued at \$24.8 billion in 2011 and included natural rubber valued at \$1.0 billion; crude oil, \$657 million; iron and steel products, \$138 million; tin, \$50 million; and bauxite and aluminum, \$9.5 million. Thailand also exported to the United States \$3.2 billion worth of computer accessories, peripherals, and parts; \$2.5 billion worth of telecommunications equipment, except computers; and \$1.1 billion worth of metal jewelry, such as watches and rings (U.S. Census Bureau, 2012a, b). Thailand's traditional major markets were the member countries of the Association of Southeast Asian Nations (ASEAN) (Indonesia, Malaysia, the Philippines, Singapore, and Vietnam), and Europe, Japan, and the United States. The growing Thai export markets included Australia, China (including Hong Kong), India, the Middle East, and South Africa.

Production

In 2011, Thailand's mineral production, including mineral fuel production, decreased by 1.8%, and manufacturing, including mineral-related manufacturing, decreased by 4.3% from that of the previous year. Cement production increased by 0.5% to 36.7 million metric tons (Mt) from 36.5 Mt in 2010, and clinker production decreased by 2.6% to 37.9 Mt from 38.9 Mt in 2010. Tin production decreased by 3.1% to 282 metric tons (t) from 291 t in 2010. Natural gas production decreased by 1.8% to 29.1 million cubic meters from 29.6 million cubic meters, and crude oil production decreased by 8.8% to 51 million barrels from 56 million barrels in 2010 (Bank of Thailand, 2012a, b, p. 7–8).

Commodity Review

Metals

Copper.—Exploration was continuing at the Puthep copper project in Loei. Thailand-registered Puthep Co. Ltd., which was a joint venture of Padaeng Industry Public Co. Ltd. of Thailand (51%) and PanAust Ltd. of Australia through its wholly owned

subsidiary PNA Pty Ltd. (49%), was conducting the exploration. The project is located in northern Thailand within a short distance of PanAust's Vientiane office in Laos and comprises the PUT 1 and PUT 2 copper deposits, which are located 14 kilometers apart. In 2011, Puthep Co. was undertaking a strategic review of the project, including investigating the potential for selling the asset (PanAust Ltd., 2012, p. i).

Gold.—Kingsgate Consolidated Ltd. of Australia owned and operated the Chatree gold mine in central Thailand. In fiscal year 2011 (which ran from the beginning of July 2010 to the end of June 2011), the company produced about 2,400 kilograms (kg) of gold and about 17,100 kg of silver. The company mined 5.3 Mt of ore during the year; however, the milled ore had a lower than planned head grade, which caused gold production to decrease by 43% from the 4,125 kg produced in 2010. The company's new processing plant had an ore processing capacity of more than 5 million metric tons per year (Mt/yr), and Kingsgate expected to produce about 4,670 kg of gold in 2012 (Kingsgate Consolidated, Ltd., 2012 p. 10–11).

Zinc.—Padaeng was engaged in mining, milling, and smelting zinc and producing zinc alloys. The company's Mae Sod Mine is located in the Mae Sod district of Tak Province; the company rehabilitated the mine and applied for a new mining lease for the concession in 2010. Padaeng's smelter was located in the Muang district of Tak Province, the roaster plant was located in Rayong Province, and the head office was located in Bangkok. In 2011, zinc consumption in Thailand increased by 2% to 122,830 t, and the average annual price of zinc increased by 1.5% to \$2,193. From its mining operations, Padaeng produced a total of 79,184 t of high-grade zinc ore, 57,153 t of zinc concentrate, and 29,664 t of zinc metal in 2011. The company produced about 136,000 t of zinc (grading 21.75%) at the Mae Sod Mine. In its smelter operations, Padaeng produced about 103,000 t of zinc metal in 2011; zinc alloy accounted for 34% of the output. The smelter also produced about 106,000 t of zinc cathodes, and used 3,000 t of secondary raw materials. Padaeng sold about 81,000 t of zinc to the domestic market, which accounted for 83% of the company's total annual zinc sales. Although the volume of Padaeng's zinc exports increased by 10% to about 14,000 t from that of the previous year, the volume of domestic zinc sales decreased by 13% (Padaeng Industry Public Co. Ltd., 2012, p. 10–12).

Industrial Minerals

Gypsum.—Thai Gypsum Products Public Co. Ltd. forecast that the market would grow by 5% to 10% in 2011 and that domestic demand for building materials would increase. The company shifted its focus to green and innovative gypsum products beginning in 2010. Thai Gypsum Products had the capacity to produce 75 million square meters per year of gypsum products. In 2011, it introduced a thermal insulation board and thermal tile to its line of products. Thai gypsum deposits occur in both northern and southern areas of the country; however, mining was concentrated in the southern part because of its proximity to the seaports. Siam Cement Group and Thai Gypsum Products were the two major suppliers to the

Thai gypsum market. Thai Gypsum Products exported about 40% of its output (Businessweek.com, 2011).

Mineral Fuels

Natural Gas and Petroleum.—Chevron Corp. of the United States commenced natural gas production from the Platong II project in the Gulf of Thailand on October 24. Platong II, which is one of Southeast Asia's largest offshore structures, is located in shallow water 193 km from the southern coastline of Thailand. Chevron invested \$3.1 billion in this project and expected to reach production of 9.3 million cubic meters per day of natural gas and 18 thousand barrels per day of liquid natural gas when the project is finished. Platong II was aimed at increasing the country's domestic natural gas production by more than 10% to meet Thailand's growing energy demand, and also increase Chevron's net natural gas production from the Gulf of Thailand by more than 20%. Chevron operated and held a 69.9% interest in the Platong II project, Mitsui Oil Exploration Co. Ltd. held a 27.4% interest, and PTT Exploration and Production Public Co. Ltd. held the remaining 2.7% (Chevron Corp., 2011).

Outlook

PanAust ranks the growth opportunity at the Puthep copper project lower than for other of the company's projects, and is considering selling the asset. Kingsgate plans to undertake further exploration and expansion at the Chatree Mine, and the company expects gold production at the mine to meet its planned annual target for 2012 by commencing and operating its new processing plant. Chevron acquired production rights in the Pakarang oil and gas field, which covers 118 square kilometers in the Gulf of Thailand, and is expected to invest about \$605 million to develop the project. The World Bank upgraded Thailand's income categorization from a lower-middle income economy to an upper-middle income economy in July 2011 owing to the country's progress in economic development (Dow Jones & Company, Inc., 2012; Kingsgate Consolidated Ltd., 2012; PanAust Ltd., 2012).

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TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^c
METALS					
Antimony:					
Ore:					
Gross weight	--	--	--	--	--
Sb content	--	--	--	--	--
Metal, smelter	271	422	555	500	500
Copper, metal, refined:					
Primary ^c	11,900	--	--	--	--
Secondary ^c	814	438	490 ²	490 ²	500
Total	12,714	438	490	490	500
Gold kilograms	3,401	2,721	5,400	4,125	2,372 ²
Iron and steel:					
Iron ore:					
Gross weight	1,554,860	2,029,100	1,400,800	969,937	970,000
Fe content ^c	779,000	855,000	800,000	485,000	485,000
Crude steel thousand metric tons	5,565	5,211	3,646	4,145	4,000
Lead, metal	73,159	73,303	55,504	55,500	55,000
Manganese ore:					
Metallurgical grade, gross weight, 46% to 50% MnO ₂	9,500	111,000	64,930	50,450	50,000
Mn content	4,550	52,700	31,200	24,200 ^e	24,000
Silver kilograms	7,727	5,465	15,300	17,092	17,098 ²
Silicon, metal (gross weight)	--	--	NA	22,500 ^e	22,500
Tantalum, metal and oxide powder	142	158	50	50	50
Tin:					
Concentrate:					
Gross weight	149	235	210	370 ^e	400
Sn content	122	215	166	291	282 ²
Metal, primary	23,104	21,860	19,423	20,000 ^e	20,000
Tungsten concentrate:					
Gross weight	923	1,112	950	950 ^e	900
W content ^c	477	617	600	600	600
Zinc:					
Ore:					
Gross weight	176,042	118,739	184,505	146,470	79,184
Zn content	32,921	17,811	34,000	25,529	29,664
Metal, primary	99,337	107,753	104,695	100,000 ^e	68,203 ²
Alloy, Zn content	64,600	70,000	31,000	30,000 ^e	35,163
INDUSTRIAL MINERALS					
Barite	8,631	9,180	51,895	33,465	35,000
Cement, hydraulic thousand metric tons	35,668	31,651	33,562	36,496	36,700 ²
Clays:					
Ball clay	563,353	1,499,993	1,000,000	1,000,000 ^e	1,000,000
Kaolin, marketable:					
Beneficiated, washed	159,186	162,215	160,000	160,000 ^e	160,000
Nonbeneficiated, unwashed	518,143	479,443	500,000	500,000 ^e	500,000
Filler	7,985	6,061	6,000	6,000 ^e	6,000

See footnotes at end of table.

TABLE 1—Continued
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2007	2008	2009	2010	2011 ^c
INDUSTRIAL MINERALS—Continued					
Diatomite	1,260	4,075	4,000	4,000 ^c	4,000
Feldspar	684,668	670,618	600,000	600,000 ^c	600,000
Fluorspar, crude, metallurgical grade	1,820	26,118	86,365	2,222	2,000
Gemstones	thousand carats	102	32	30	30 ^c
Gypsum	thousand metric tons	8,643	8,500	8,679	9,985
Perlite ^c	6,400	7,000	7,000	7,000	7,000
Phosphate rock, crude ^c	3,550 ²	3,675 ²	3,000	3,000	3,000
Salt: ^c					
Rock	1,134,931 ²	1,211,581 ²	1,200,000	1,200,000	1,200,000
Other	100,000	100,000	100,000	100,000	100,000
Sand, silica, glass ^c	844,071 ²	495,848 ²	500,000	500,000	500,000
Stone:					
Calcite	672,580	823,706	750,000	750,000 ^c	750,000
Dolomite	1,108,425	1,353,763	1,200,000	1,200,000 ^c	1,200,000
Granite: ^c					
Dimension stone	cubic meters	10,515 ²	10,579 ²	10,000	10,000
Industrial rock	thousand metric tons	5,229 ²	5,190 ²	5,000	5,000
Limestone:					
Construction and other uses	do.	87,402	87,000	90,000	90,000 ^c
Dimension stone	do.	233	233	200	200 ^c
For cement manufacture only	do.	63,799	54,885	60,000	60,000 ^c
Marble, dimension stone and fragment	cubic meters	848,806	664,930	760,000	760,000 ^c
Marl for cement manufacture only		31,750	41,720	99,300	68,000
Quartz		4,924	3,290	4,000	4,000
Shale for cement manufacture only ^c	thousand metric tons	4,769 ²	4,026 ²	4,000	4,000
Travertine ^c		3,490 ²	3,640 ²	3,000	3,000
Talc and related materials:					
Pyrophyllite		415,420	106,600	200,000	200,000 ^c
Talc ^c		3,508 ²	3,264 ²	3,000	3,000
Zirconium		1,023	--	--	--
MINERAL FUELS AND RELATED MATERIALS					
Coal, lignite	thousand metric tons	18,239	18,095	16,360	17,907
Natural gas, gross production	million cubic meters	25,400	27,576	26,362	29,583
Petroleum:					
Crude	thousand 42-gallon barrels	48,745	52,805	56,302	55,906
Natural gas condensate	do.	28,778	31,157	30,625	31,730
Refinery products:					
Liquefied petroleum gas	do.	48,759	53,842	57,531	66,180
Gasoline	do.	54,739	53,142	55,678	54,986
Jet fuel	do.	33,478	37,750	37,582	38,972
Kerosene	do.	776	1,226	584	2,935
Distillate fuel oil	do.	40,581	43,231	43,300	37,737
Residual fuel oil ^c	do.	27,109 ²	26,500	30,000	25,000
Unspecified ^{c,3}	do.	3,626 ²	3,600	4,000	3,000
Total ^{c,4}	do.	209,000	219,000	229,000	229,000
					230,000

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through September 27, 2012.

²Reported figure.

³Includes refinery fuel and refinery gains or losses.

⁴Data are rounded to three significant digits; may not add to totals shown.

Sources: Department of Mineral Resources, Mineral Statistics of Thailand; Department of Primary Industries and Mines; Ministry of Energy, Energy Policy and Planning Office; and U.S. Geological Survey Minerals Questionnaires, 2007–2011.

TABLE 2
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(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
Do.		Other companies	Various Thai Provinces	NA
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 Co. Ltd.	Pra Phutthabath, Sara Buri Province	4,800
Do.		Jalaprathan Cement Co. Ltd. (Cement Francais S.A., 37%; Veatprapat Holding Co. Ltd., 19%; others, 44%)	Takli, Nakhon Sawan Province, and Cha-Am, Phetchaburi Province	2,350
Do.		Samukee Cement Ltd.	Pakchong, Nakhon Ratchasima Province	125
Do.		Saraburi Cement Co. Ltd. (CEMEX Asia Holdings Ltd., 99%)	Chalerm Phrakiat, Sara Buri Province	700
Do.		Siam Cement Industry Co. Ltd. (Bureau of the Crown Property, 30%; Thai Security Depository Co. Ltd., 6.94%; CPB Equity Co. Ltd., 5.6%; other financial institutions and the general public, 57.46%)	Kaeng Khoi, Phabudhabat, and Khao Wong, Sara Buri Province; Chaehom, Lampang Province; Thung Song, Nakhon Si Thammarat Province; and Ta Luang, Phra Nakhon Si Ayutthaya Province	23,200
Do.		Siam City Cement Co. Ltd. (SCCC) (Holcim Ltd., 33.7%; Rattanak family, 27%; other investors, 39.3%)	Kaeng Khoi, Sara Buri Province	14,500
Do.		TPI Polene Co. Ltd.	do.	9,900
Coal, lignite		Electricity Generating Authority of Thailand (EGAT) (Government, 100%)	Mae Moh, Lampang Province	20,000
Do.		Lanna Lignite Public Co. Ltd.	Ban Pakha, Lamphun Province	1,000
Copper		Thai Copper Industries Public Co. Ltd. (TCI)	Rayong Industrial Park	165
Feldspar, concentrate		Asia Mineral Processing Co. Ltd.	Provinces of Nakhon Si Thammarat and Trang	500
Fluorspar, concentrate		Asian Mineral Resources Co. Ltd.	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 in the Gulf of Thailand	15
Do.	do.	Unocal Thailand Ltd.	Baanpot, Erawan, Funan, Kaphong, Pladang, Satun, Pailin, Trat, all in the Gulf of Thailand	33
Gold	kilograms	Akara Mining 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 Province and Surat Thani Province	8,500
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
Petroleum, crude, including condensate	thousand 42-gallon barrels per day	Chevron Offshore (Thailand) Ltd.	Benjamas, Tantawan, offshore in the Gulf of Thailand	35
Do.	do.	PTT Exploration and Production Public Co. Ltd. (PTTEP)	Arthit, Songkhla, Gulf of Thailand	20
Do.	do.	Thai Shell Exploration and Production Co. Ltd.	Sirikit in Kamphaeng Phet Province	24
Do.	do.	TOTAL Exploration and Production (Thailand)	Bongkot, offshore in the Gulf of Thailand	12
Do.	do.	Unocal Thailand Ltd.	Baanpot, Erawan, Funan, Gomin, Jakrawan, Kaphong, Pailin, Platon, Satun, Surat, Trat Plamuk, offshore in the Gulf of Thailand	38

See footnotes at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(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
Steel, rolled		The Bangkok Iron and Steel Works Co. Ltd.	Phrapradaeng, Samut Prakan Province	120
Do.		Bangkok Steel Industry Public Co. Ltd.	do.	300
Do.		Tata Steel (Thailand) Plc (Tata Steel Ltd., 67.11%; McDonald Investment, 6.5%; other investors, 26.39%)	Map Ta Phut, Rayong Province; Sriracha, Chonburi Province; Ban Mon, Sara Buri Province	1,700
Do.		Namheng Steel Co. Ltd.	Lop Buri 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)	Map Ta Phut, Rayong Province	600
Tantalum, metal powder and oxides	metric tons	H.C. Starck (Thailand) Co. Ltd. (H.C. Starck GmbH, 94.98%, and others, 5.02%)	do.	250
Tin:				
Concentrate		Numerous small companies	Nakhon Si Thammarat, Phangnga, Phuket, and Rayong Provinces	3
Refined		Thailand Smelting and Refining Co. Ltd. (Thaisarco) (Amalgamated Metal Corp., 75.25%, and other, 24.75%)	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.	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.