



# 2014 Minerals Yearbook

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THAILAND [ADVANCE RELEASE]

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# THE MINERAL INDUSTRY OF THAILAND

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In 2014, the real rate of growth of Thailand's gross domestic product (GDP) increased by less than 1% compared with growth of 2.9% in 2013. Thailand's mineral production (including mineral fuels) decreased by 2.7% in 2014 compared with that of 2013, and that of its construction sector decreased by 4.4%. Several events, including a magnitude 6.0 earthquake and political instability, affected Thailand's economy negatively in 2014 (Bank of Thailand, 2014; 2015c, p. 1; Disaster Report, 2014; Noble, 2014; Asian Development Bank, 2015).

In 2014, the total foreign direct investment in Thailand was valued at \$12.8 billion (which was a decrease of 11% compared with that of 2013), from which 0.9% was invested in the mining and quarrying sector and 1.7% was invested in the construction sector. The investment environment in the country slowed in 2014 as most businesses continued to put off investments as they awaited signs of economic recovery and the Government's announcement of infrastructure investments (Bank of Thailand, 2015a; 2015c, p. 1–2).

## Minerals in the National Economy

In 2014, Thailand was one of the world's leading producers of feldspar (5.5% of world production), gypsum (2.6%), cement (0.8%), and tin (0.07%). The country's identified mineral resources were being exploited mainly for domestic consumption and export. Thailand's manufacturing sector was considered very important to the country's economy, as it represented more than 30% of the country's GDP. Thailand's mining industries produced metals, such as copper, gold, iron, lead, manganese, silver, tungsten, and zinc, and a variety of industrial minerals, such as barite, clays, salt, sand, and stones (table 1; Anderson, 2016; Crangle, 2016; Tanner, 2016; van Oss, 2016).

## Government Policies and Programs

In March 2014, Thailand's Parliament approved the Mineral and Petroleum Resources Development (MPRDA) bill. The purpose of the MPRDA bill was to amend and eliminate ambiguities encountered in the MPRDA Act 28 of 2002 as amended by the 2008 MPRDA Amendment Act. The new bill was designed to align the MPRDA with the Geoscience Act of 1993, add to sanction regulations, improve the mining regulatory system, lay out rights and enhance provisions related to the beneficiation of minerals, promote national energy security, provide regulations for associated minerals, and restructure administrative processes. For instance, the MPRDA bill proposed increasing sanctions for mining offenses by charging fines based on the percentage of the right holder's annual revenue accrued in country and its exports from the preceding year, rather than charging a set fine. The percentage varies from 5% to 10%, depending on the nature of the offense. In terms of beneficiation, the MPRDA bill promotes the local

beneficiation of mineral resources to support the increase of local capacity. Beneficiation, as defined by the bill, refers to the addition of value or transformation of a mineral to a higher value product for domestic consumption or exportation. An associated mineral, as defined in the bill, is any mineral that is mineralogically associated with the primary mineral being mined and is located in the same deposit within the area of the mining license, and for which it is impossible to mine the primary mineral without also mining the associated mineral. The bill stipulates that any mining license holder can also mine and dispose of any mineral associated with the primary mineral, although the license holder is not licensed to mine the associated mineral (Beech, 2014).

In July, the Government announced Thailand's Mining Fiscal Regime—H1 2014 Report. The report outlines the governing bodies, governing laws, mining ownership and licenses, mining rights and obligations, and key fiscal terms covering the following commodities—coal, copper, gold, iron ore, and silver. The country's mining industry is overseen by the Ministry of Energy (MoE), the Ministry of Industry (MoI), and the Ministry of Natural Resources and Environment (MoNRE). The MoE is responsible for sustainable energy management to promote a stable environment for energy prices, and to increase the competitiveness of the production sector. The Department of Mineral Fuels, which is under the MoE, is the governmental agency responsible for overseeing the petroleum industries in the country; it promotes petroleum exploration and exploitation and development of the domestic petroleum supply. The MoI is the principal Government agency that oversees the country's mineral sector and the implementation of the Mineral Act. The Department of Primary Industries and Mines (DPIM), which is under the MoI, is responsible for the development of mining and primary industries, which make direct use of natural resources. It also oversees, supervises, promotes, and supports mining and metallurgical activities to fulfill the demands for sustainable utilization of Thailand's mineral resources while providing for public safety and protecting the environment in compliance with the Mineral Act. The DPIM also provides technical assistance to the metallurgical, mineral-processing, and mining industries. 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; Wood, 2014; Department of Energy, 2015).

## Production

In 2014, Thailand's production increased for monazite (43%), rare-earth oxides (37.5%), zinc, zinc content (30%), tin concentrate (18%), and copper (13%). Decreases were reported

for primary zinc metal (16%), zinc alloys (13%), and iron ore (11%). In the industrial minerals sector, increases were reported for perlite (279%) following production difficulties in 2013, feldspar (32%), marble (32%), barite (26%), and silica sand (24%). Decreases were reported for marl (98%) and quartz (51%). The country produced about the same amount of mineral fuels in 2014 as in 2013 (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. The Petroleum Authority of Thailand (PTT), the PTT Exploration and Production Public Co. 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 involved the mining and processing of metallic and industrial minerals and the production of crude oil and natural gas (table 2).

## Mineral Trade

In 2014, Thailand's exports were valued at about \$227.5 billion compared with \$228.5 billion in 2013, which was a decrease of 0.4%. Imports were valued at about \$227.7 billion compared with \$250.4 billion in 2013, which was a decrease of 9%. In 2014, Thailand exported petroleum products, which were valued at \$11.4 billion and represented about 5% of total exports. Exports of mineral commodities were valued at \$9.6 billion, which represented 4.2% of total exports and included such commodities as aluminum, copper, iron and steel, and other metals. Exports of nonmonetary gold were valued at \$2.8 billion, which represented about 1.2% of total exports. Thailand's main export partners in 2014 were China (11%), the United States (10.5%), Japan (9.5%), Malaysia (5.6%), and Hong Kong (5.5%) (Bank of Thailand, 2015d, e).

Thailand imported raw materials and intermediate goods, including fuel (crude oil, coal, coke, natural gas, peat, and petroleum products) valued at \$47.5 billion, which represented about 21% of total imports; base metal materials valued at \$19.6 billion, or 8.6% of total imports; nonmonetary gold valued at \$6.6 billion, or about 3% of total imports; and minerals (unspecified) valued at \$2.6 billion, or 1.1% of total imports. Thailand's main import partners were China (17%), Japan (15.6%), the United States (6.4%), and Malaysia and the United Arab Emirates (5.6% each) (Bank of Thailand, 2015b, e).

## Commodity Review

### Metals

**Copper.**—As of December 2013, 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%), recognized an impairment provision of the total investment

in the Puthep copper project. In 2011, PanAust and Padaeng started the sale of its property, but the decision to execute the impairment provision came as the companies had no plans to develop the asset and no purchaser emerged from the sale process. The Puthep copper project was located at Loei in northern Thailand (PanAust Ltd., 2014).

**Gold and Silver.**—Kingsgate Consolidated Ltd. of Australia owned and operated the Chatree gold mine in central Thailand. In fiscal year 2014 (July 1, 2013, to June 30, 2014), the company produced 4,185 kilograms (kg) of gold and 30,863 kg of silver. The company mined about 6.2 million metric tons (Mt) of ore during the year with an average grade of 0.83 gram per metric ton (g/t) gold and 11.81 g/t silver. The company's mining activities at the Chatree property focused on the higher grade ore of Pit A and the near-surface oxide zones around the property. Exploration activities within the Chatree property remained a priority during 2014, from which the company identified shallow mineralization located adjacent to Pit A as well as within the Q Prospect area. The company planned to continue exploration drilling activities in 2015 with the goals of increasing resources and reserves and expanding the exploration area to include testing adjacent areas, such as K East, K West, and the southern part of Pit A. As of June 2014, proved and probable reserves at the Chatree property were estimated to be 54.4 Mt at grades of 0.80 g/t gold and 9.25 g/t silver (Kingsgate Consolidated Ltd., 2014, p. 2, 6, 12–13, 16, 32).

**Iron and Steel.**—In August 2014, TY Steel Co. (a subsidiary of Tycoons Group International Co. Ltd.) announced the start of its plant operations in Thailand. The TY Steel plant, which manufactured wire rod and rebar, supplied products to the infrastructure sector of the country. The production capacity of its facility was estimated at 15,000 metric tons per month of rebar products (Lin, 2014).

**Zinc.**—Padaeng was engaged in the mining, milling, and smelting of zinc and the production of zinc alloys in Thailand. Padaeng owned the only zinc mine in Thailand (the Mae Sod Mine), which is located in the Mae Sod District of Tak Province. Padaeng's smelter was located in the Muang District of Tak Province, and the roaster plant was located in Rayong Province. In 2014, Padaeng offered training programs to employees and communities that are located near the Mae Sod Mine in order to prepare for the mine's closure owing to resource depletion. The mine's closure was expected in late 2016 or early 2017, although implementation of closure would extend from 2015 through 2021. After the termination of mine operations, the company was expected to continue to rehabilitate the area during the next 5 years. By yearend 2014, the company had completed about 60% of the rehabilitation plan for the mine site. Also, Padaeng canceled a mining application lease that it had submitted to the Government for the Mae Sod Mine area after the Government reclassified the area as a protected watershed zone. Given the new classification, mining activities in the reclassified zone were prohibited (Padaeng Industry Public Co. Ltd., 2015).

### Industrial Minerals

**Cement.**—In 2014, a total of seven cement companies operated 12 plants in Thailand with a total (combined)

production capacity of 56.3 million metric tons per year (Mt/yr) and total production for the year of about 35 Mt of cement. The Siam Cement Group (SCG) announced during the first quarter of 2014 that it planned to cut back cement shipments from Thailand. SCG proposed cement shipments of 3 Mt in 2014 compared with 4 Mt in 2013 and 5 Mt in 2012. SCG's operational plans were affected by political instability (Global Cement, 2014; Thailand Cement Manufacturers Association, 2014).

In mid-2013, TPI Polene Public Co. Ltd. announced the construction of a new line in its Saraburi Province cement plant at a cost of \$300 million. The company projected the new line to commence production in 2015 with a production capacity of 10,000 metric tons per day of clinker. After the completion of the project, the plant would have a total capacity of 12 Mt/yr (International Cement Review, 2013).

### **Mineral Fuels**

**Natural Gas and Petroleum.**—In July 2014, the Thai Government announced a cut in natural gas imports after reports that the consumption growth in the country had dropped to a two-decade low level. Demand for gas decreased significantly as did consumption of power and petrochemicals; the situation came about at the same time that the economy was being affected by political unrest. PTT Exploration and Production Public Co. Ltd. (PTT PCL), which was Thailand's only gas supplier and the country's biggest energy conglomerate, reduced gas imports from neighboring Burma. On average, about 80% to 85% of the country's demand for gas was met by domestic production, 12% to 16% was met by imports from Burma, and the remaining 3% to 4% was met by liquefied natural gas (LNG) imported into the country. Prior to the political turmoil, the increase in demand for natural gas averaged 7% to 8% annually. In 2015, the Government expected LNG imports to increase by about 500,000 metric tons per year (t/yr) owing to a supply contract agreement with the Government of Qatar (Jittapong and Tan, 2014).

In 2014, PTT PCL announced plans to expand capacity at the Map Ta Phut LNG import terminal to 10 Mt/yr by building a 5-Mt/yr regasification facility at a cost of \$3.8 billion. The proposed project was expected to be completed by 2017 and would include two 64,800-t storage tanks to be located at the terminal in Rayong Province. PTT PCL was also considering building a second LNG import terminal with an estimated capacity of 5 to 10 Mt/yr of LNG to meet domestic demand from the power-generation industry. The project was proposed to commence operations by 2020 and would be located near the Map Ta Phut terminal in the Gulf of Thailand (Petroleum Economist, 2014).

In November 2014, Tap Oil Ltd. announced the start of production at the Manora oilfield, which is located offshore Thailand and was operated by Mubadala Petroleum. The project was developed at a cost of \$300 million, and had a production capacity of 15,000 barrels per day of oil. The company was expected to reach full capacity by the first quarter of 2015. Manora oilfield was owned by Mubadala (60%), Tap Oil (30%), and North Gulf Petroleum (10%) (Wilkinson, 2014).

### **Outlook**

Thailand experienced challenging years in 2013 and 2014, mainly owing to political instability, which affected the overall growth of the economy and investment and trade. Economic recovery will depend on the political stability of the country and private sector confidence to reestablish business and investment ties in Thailand. In addition, the establishment of a permanent Government will most likely determine the pace of the country's economic recovery.

According to the Bank of Thailand, the country's economy is expected to perform better in 2015 than in 2014. As an export-oriented emerging economy, Thailand's manufacturing and service sectors are expected to improve their performance during the next few years (Bank of Thailand, 2015c).

Demand for cement in 2015 would depend on the Government's infrastructure spending, which had decreased by 2014 as a result of the political unrest (International Cement Review, 2014). On the other hand, by 2015, the Government expected LNG imports to increase by about 500,000 t/yr owing to the start of a supply contract with the Government of Qatar. Kingsgate planned to further explore for gold at the Chatree Mine leasing area in order to extend the mine's life.

### **References Cited**

- Anderson, C.S., 2016, Tin: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 174–175.
- Asian Development Bank, 2015, Basic statistics 2015, Thailand: Asian Development Bank, 6 p. (Accessed June 17, 2015, at <http://www.adb.org/sites/default/files/publication/158591/basic-statistics-2015.pdf>.)
- Bank of Thailand, 2014, Table 2—Growth rate of domestic production in major sectors: Bangkok, Thailand, Bank of Thailand, 1 p. (Accessed June 30, 2015, at <https://www.bot.or.th/English/Statistics/Indicators/Docs/tab02.pdf>.)
- Bank of Thailand, 2015a, Foreign direct investment classified by business sector of Thai Enterprises (US\$): Bangkok, Thailand, Bank of Thailand, undated. (Accessed August 31, 2015, at <http://www2.bot.or.th/statistics/BOTWEBSTAT.aspx?reportID=656&language=eng>.)
- Bank of Thailand, 2015b, Imports classified by economic classification (US\$): Bangkok, Thailand, Bank of Thailand, August 31. (Accessed August 31, 2015, at <http://www2.bot.or.th/statistics/ReportPage.aspx?reportID=746&language=eng>.)
- Bank of Thailand, 2015c, Thailand's economic conditions in 2014: Bangkok, Thailand, Bank of Thailand. (Accessed July 24, 2015, at [https://www.bot.or.th/English/MonetaryPolicy/EconomicConditions/AnnualReport/AnnualReport/Annual\\_eng\\_2014.pdf](https://www.bot.or.th/English/MonetaryPolicy/EconomicConditions/AnnualReport/AnnualReport/Annual_eng_2014.pdf).)
- Bank of Thailand, 2015d, Total value and quantity of exports classified by product group (US\$): Bangkok, Thailand, Bank of Thailand, August 31. (Accessed August 31, 2015, at <http://www2.bot.or.th/statistics/ReportPage.aspx?reportID=748&language=eng>.)
- Bank of Thailand, 2015e, Trade classified by country (US\$): Bangkok, Thailand, Bank of Thailand, August 31. (Accessed August 31, 2015, at <http://www2.bot.or.th/statistics/ReportPage.aspx?reportID=744&language=eng>.)
- Beech, Warren, 2014, Mineral and petroleum resources development Bill: Hogan Lovells Publications, May. (Accessed July 3, 2015, at <http://www.hoganlovells.com/mineral-and-petroleum-resources-development-bill-05-22-2014/>.)
- Crangle, R.D., Jr., 2016, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 76–77.
- Department of Energy [Thailand], 2015, History of Department of Mineral Fuels: Department of Energy. (Accessed June 24, 2015, <http://www.dmf.go.th/index.php?act=about&ln=en>.)
- Department of Primary Industries and Mines [Thailand], 2014, Mission: Department of Primary Industries and Mines. (Accessed June 24, 2015, at <http://www.dpim.go.th/en/>.)

- Disaster Report, 2014, Thailand earthquake 2014 recorded as strongest so far!: Disaster Report, May 6. (Accessed June 3, 2015, at <http://www.disaster-report.com/2014/05/strongest-earthquake-in-100-years-hits.html>.)
- Global Cement, 2014, Siam Cement may change business plans in wake of political unrest: Global Cement News, March 25. (Accessed June 17, 2015, <http://www.globalcement.com/news/item/2368-siam-cement-may-change-business-plans-in-wake-of-political-unrest>.)
- International Cement Review, 2013, Groundbreaking plant news: International Cement Review, July, p. 33–34.
- International Cement Review, 2014, Thailand—Slower demand growth expected: International Cement Review, March, p. 12.
- Jittapong, Khettiya, and Tan, Florence, 2014, Thailand turns off tap on gas imports as economy falters: Thomson Reuters Corp., July 11. (Accessed July 14, 2014, at <http://af.reuters.com/article/energyOilNews/idAFL3N0OC18X20140711?sp=true>.)
- Kingsgate Consolidated Ltd., 2014, Annual report 2014: Sydney, New South Wales, Australia, Kingsgate Consolidated Ltd., October 23, 121 p. (Accessed July 8, 2015, at [http://kingsgate.com.au/wp-content/uploads/documents/KCN\\_AR2014\\_Web.pdf](http://kingsgate.com.au/wp-content/uploads/documents/KCN_AR2014_Web.pdf).)
- Lin, Johnny, 2014, Tycoons Group steps into rebar market in Thailand: Yieh Corp., August 27. (Accessed August 27, 2014, at [http://www.yieh.com/news\\_detail.aspx?par=71485](http://www.yieh.com/news_detail.aspx?par=71485).)
- Noble, Josh, 2014, Thai economy shrinks on political turmoil: Financial Times, May 19. (Accessed June 3, 2015, at <http://www.ft.com/cms/s/0/3190f97c-df1c-11e3-a4cf-00144feabdc0.html#axzz3kiZlgs1>.)
- Padaeng Industry Public Co. Ltd., 2015, Annual report and sustainability report 2014: Bangkok, Thailand, Padaeng Industry Public Co. Ltd., 154 p. (Accessed June 10, 2015, at [http://www.padaeng.com/files/en/report/2015\\_05/pdf/39076452351994162803.pdf](http://www.padaeng.com/files/en/report/2015_05/pdf/39076452351994162803.pdf).)
- PanAust Ltd., 2014, Puthep copper project: PanAust Ltd. (Accessed June 24, 2015, at <http://www.panaust.com.au/thailand-puthep>.)
- Petroleum Economist, 2014, News in brief—Thailand: Petroleum Economist, v. 81, no. 4, p. 69.
- Tanner, A.O., 2016, Feldspar: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 60–61.
- Thailand Cement Manufacturers Association, 2014, TCMA 2014—Annual report: Bangkok, Thailand, Thailand Cement Manufacturers Association annual report, 30 p. (Accessed July 8, 2015, at <http://thaicma.or.th/cms/assets/Uploads/tcma2014.pdf>.)
- van Oss, H.G., 2016, Cement: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 44–45.
- Wilkinson, Rick, 2014, Manora oil field offshore Thailand comes on stream: Oil & Gas Journal, November 12. (Accessed November 13, 2014, at <http://www.ogj.com/articles/2014/11/manora-oil-field-offshore-thailand-comes-on-stream.html>.)
- Wood, Laura, 2014, Research and markets—Thailand’s mining fiscal regime—H1 2014—Coal, iron ore, copper, gold, and silver: Business Wire, July 2. (Accessed June 24, 2015, at <http://www.businesswire.com/news/home/20140702005414/en/Research-Markets-Thailands-Mining-Fiscal-Regime-H1#.Vd4Tj5erGew>.)

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2010	2011	2012	2013	2014	
METALS						
Antimony:						
Ore, gross weight	--	25	28	-- <sup>r</sup>	--	
Metal, smelter	500 <sup>e</sup>	500 <sup>e</sup>	672	488 <sup>3</sup>	706	
Copper, metal, refined, secondary	723 <sup>r</sup>	525 <sup>3</sup>	721 <sup>r</sup>	203	229	
Gold, mine output, Au content	kilograms	4,046 <sup>r</sup>	2,860 <sup>3</sup>	4,895 <sup>r</sup>	4,419 <sup>r</sup>	4,576
Iron and steel:						
Iron ore:						
Gross weight	979,937	489,359	303,233	389,620	347,918	
Fe content	480,000 <sup>r</sup>	240,000	149,000	191,000	170,500	
Crude steel	thousand metric tons	4,145	4,238 <sup>r</sup>	3,328 <sup>r</sup>	3,578 <sup>r</sup>	3,500 <sup>e</sup>
Lead, metal, secondary	55,500	93,000 <sup>r,e</sup>	86,507	87,385	79,250	
Manganese ore:						
Metallurgical grade, gross weight, 46% to 50% MnO <sub>2</sub>	50,450	398	8,151	14,320	14,330	
Mn content	24,200 <sup>e</sup>	187	3,830 <sup>r</sup>	6,730 <sup>r</sup>	6,900	
Silver, mine output, Ag content	kilograms	17,558	19,456	32,047 <sup>r</sup>	32,381 <sup>r</sup>	31,046
Tin:						
Concentrate, Sn content	292	286	199	132	156	
Metal, primary	20,000	20,000	19,996	19,088	16,929	
Tungsten:						
Gross weight	711 <sup>r</sup>	292	133	252	173	
Concentrate, W content	300 <sup>r</sup>	160 <sup>r</sup>	80	140 <sup>r</sup>	100	
Zinc:						
Ore:						
Gross weight	146,470	148,391	166,642 <sup>r</sup>	172,578	226,893	
Zn content	25,529	29,664 <sup>r</sup>	31,000 <sup>r</sup>	30,000 <sup>r</sup>	39,140	
Metal, primary	103,620 <sup>r</sup>	103,366 <sup>r</sup>	97,000 <sup>r</sup>	76,576 <sup>r</sup>	65,694	
Alloy, Zn content	30,000 <sup>e</sup>	35,163	30,400 <sup>e</sup>	23,000 <sup>e</sup>	20,000	
INDUSTRIAL MINERALS						
Barite	33,465	67,703	64,499	107,437	134,961	
Cement, hydraulic	thousand metric tons	28,840 <sup>r</sup>	30,290 <sup>r</sup>	31,760 <sup>r</sup>	35,854 <sup>r</sup>	34,980
Clays:						
Ball clay	1,513,767	425,048	447,348 <sup>r</sup>	112,187 <sup>r</sup>	123,082	
Bentonite	130	55,220	141,000 <sup>r</sup>	150	--	
Kaolin, marketable:						
Beneficiated, washed	156,827	163,881	141,764 <sup>r</sup>	119,512 <sup>r</sup>	124,094	
Nonbeneficiated, unwashed	582,994	932,326	1,000,975 <sup>r</sup>	631,133 <sup>r</sup>	755,913	
Filler	3,837	4,329	300	-- <sup>r</sup>	--	
Diatomite	7,100	38,130	8,500	-- <sup>3</sup>	--	
Feldspar	641,900	1,041,152	1,100,723 <sup>r</sup>	1,072,656	1,413,428	
Fluorspar, crude, metallurgical grade	2,222	5,093	9,602	NA	NA	
Gypsum	thousand metric tons	10,173	10,994	11,447	12,383	12,445
Perlite	14,700	26,500	41,400	14,293	54,100	
Phosphate rock, crude	35,783	3,300	1,990	350	500	
Rare earths:						
Monazite	NA	4,500	3,500	1,400	2,000	
Rare earth oxide	NA	2,500	1,900	800	1,100	
Salt, rock	1,405,406	1,359,493	1,363,539	1,300,156	1,381,067	
Sand, silica, glass	323,985	221,721	434,094	876,085 <sup>r</sup>	1,083,174	
Stone:						
Calcite	693,754	786,250	865,800 <sup>r</sup>	841,746 <sup>r</sup>	991,981	
Dolomite	2,451,990	2,556,765	2,608,997 <sup>r</sup>	2,487,135 <sup>r</sup>	2,471,486	
Granite:						
Dimension stone	cubic meters	6,123	5,267	5,505 <sup>r</sup>	2,950 <sup>r</sup>	2,976
Industrial rock	thousand metric tons	5,259	5,648	6,347 <sup>r</sup>	7,068 <sup>r</sup>	7,591
Limestone	do.	134,988	145,573	150,120 <sup>r</sup>	161,440 <sup>r</sup>	165,513
Marble, dimension stone and fragment	cubic meters	779,234	509,237	311,839	492,369 <sup>r</sup>	650,382
Marl for cement manufacture only	68,000	65,000	100,000	75,500 <sup>r</sup>	1,200	

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2010	2011	2012	2013	2014	
<b>INDUSTRIAL MINERALS—Continued</b>						
Stone—Continued:						
Quartz	49,064	152,576	404,800 <sup>r</sup>	393,791 <sup>r</sup>	194,831	
Shale for cement manufacture only	thousand metric tons	4,181	4,593	4,755 <sup>r</sup>	4,307 <sup>r</sup>	5,409
Travertine		1,760	900	900	-- <sup>r</sup>	5,103
Talc		672	2,304	5,856	7,880	8,208
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal, lignite	thousand metric tons	18,399 <sup>r</sup>	21,327 <sup>r</sup>	18,069	18,111	17,991
Natural gas, gross production	million cubic meters	29,583	29,059	21,766	41,797 <sup>r</sup>	42,118
Petroleum:						
Crude	thousand 42-gallon barrels	55,906	50,976	37,164	54,561 <sup>r</sup>	50,647
Natural gas condensate	do.	31,730	30,693	21,169	33,273 <sup>r</sup>	34,430
Refinery products <sup>e</sup>	do.	229,000	229,000	229,000	369,713 <sup>r</sup>	362,199

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. do. Ditto. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through August 31, 2015.

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

<sup>3</sup>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 2014

(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%; Rattanak family, 27%; other investors, 45.5%)	Kaeng Koei District, Saraburi Province	14,784
Do.		TPI Polene Public Co. Ltd.	do.	9,074
Do.		Siam Cement (Ta Luang) Co. Ltd. (a 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.		Siam Cement (Kaeng Khoi) Co. Ltd. (a subsidiary of SCG Cement-Building Materials Co. Ltd.)	Kaeng Khoi District, Saraburi Province	7,296
Do.		Siam Cement (Thung Song) Co. Ltd. (a subsidiary of SCG Cement-Building Materials Co. Ltd.)	Thung Song District, Nakorn Sri Thammarat	6,912
Do.		Siam Cement (Lampang) Co. Ltd. (a 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 Public 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		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.	Chevron Corp.	Baanpot, Erawan, Funan, Kaphong, Pladang, Satun, Pailin, Trat, all in the Gulf of Thailand	33
Do.	do.	do.	Platong II project	NA
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 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
Petroleum, crude, including condensate	thousand 42-gallon barrels per day	Chevron Corp.	Benjamas, Tantanwan, 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.	Mubadala Petroleum (60%), Tap Oil Ltd. (30%), North Gulf Petroleum (10%)	Manora oilfield, offshore in the Gulf of Thailand	15
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
Do.	do.	Chevron Corp.	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 2014

(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	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 located 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%)	do.	250
<b>Tin:</b>				
Concentrate		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
<b>Zinc:</b>				
In concentrate		Padaeng Industry Public Co. Ltd. (Bali Ventures Ltd., 21.7%; Thai Ministry of Finance, 13.81%; RAK Minerals & Metals Investments, 12.5%; and 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.