



# 2013 Minerals Yearbook

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## PHILIPPINES

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# THE MINERAL INDUSTRY OF THE PHILIPPINES

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In 2013, one of the main mineral commodities produced in the Philippines was nickel. The Philippines accounted for 17% of the world production of mined nickel, and 3% of world production of mined cobalt. The country also produced other mineral commodities, such as cement, chromium, copper, gold, marine salt, and silver (table 1; Kuck, 2015; Shedd, 2015).

During 2013, the typhoon season proved to be challenging for the Philippines as at least four typhoons hit the country directly. Typhoon Utor hit the main island of Luzon on August 11, Typhoon Nari struck the northern Philippines on October 14, Typhoon Krosa hit the northern part of the country on October 31, and Typhoon Haiyan battered the country on November 7 and 8. In addition, on October 15, a magnitude 7.1 earthquake struck near the city of Catigbian on Bohol Island in Central Visayas, Philippines. The Chamber of Mines of the Philippines and the Philippine Mine Safety and Environment Association took an active role in the recovery of the country, gathering teams of mining workers to provide assistance in the search, rescue, and recovery efforts in the aftermath of the disasters. The effect of the events to the mining industry was yet to be determined (ASIA Miner News, 2013; Doyle, 2013; Mining Philippines News, 2013, p. 1–3, 6; Qing, 2013; Thomas, 2013; U.S. Geological Survey, 2013; Wingard and Brandlin, 2013).

## Minerals in the National Economy

In 2013, the mining and quarrying sector (at constant 2000 prices) contributed about 1.08% to the Philippines' gross domestic product (GDP) compared with 1.14% in 2012. The construction sector contributed 5.64% to the GDP compared with 5.52% in 2012. The value of metallic mineral production was \$2.34 billion<sup>1</sup> compared with \$2.35 billion in 2012. The value of nickel produced in 2013 was about \$973.2 million (0.6% of the GDP); gold, \$764.3 million (0.5% of the GDP); and copper, \$526.8 million (0.3% of the GDP) (Bangko Sentral ng Pilipinas, 2014; Mines and Geosciences Bureau, 2014b–c).

According to the Philippines Senate Economic Planning Office, the modest contribution of the mining industry revenues to the economy of the country could be in part attributable to the limited domestic minerals processing facilities. Most of the mined raw material is exported to other countries for processing. The Senate Economic Planning Office suggested that in order to overcome the challenge and generate more tax revenues and employment opportunities in the mining sector, legislation should be introduced that mandates for mining enterprises to set up processing facilities in the country (Agub, 2013).

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<sup>1</sup>Where necessary, values have been converted from Philippine pesos (PHP) to U.S. dollars (US\$) at an exchange rate of PHP42.45=US\$1.00 for 2013 and PHP42.23=US\$1.00 for 2012.

## Government Policies and Programs

The Philippine Mining Act of 1995 regulates mineral resource development, requires the Government to monitor mineral activity (production, trade, and value) and maintain a database of mineral reserves, and encourages direct investment by the private and public sectors in mineral exploration and development activities in the Philippines. The Government grants exploration permits to qualified applicants to explore for mineral resources. Exploration permits are valid for 2 years and are renewable for not more than 4 years for exploration of nonmetallic minerals and 6 years for exploration of metallic minerals (Mines and Geosciences Bureau, 2014d).

The Philippine Mining Act of 1995 allows for three types of mining agreements, each valid for 25 years and renewable for an additional 25 years. The first is a mineral agreement in which the Government grants a domestic investor (a Filipino individual or corporation) an exclusive right to conduct mining operations in the contracted area. The second type of mining agreement is a financial or technical assistance agreement (FTAA), which is available to domestic and foreign corporations for a maximum area of 81,000 hectares (ha) onshore or 324,000 ha offshore. The third type of agreement is a mineral-production-sharing agreement (MPSA) for properties with a maximum area of 16,200 ha and is open to domestic and foreign corporations (Mines and Geosciences Bureau, 2014d).

On July 6, 2012, the Philippine President issued Executive Order No. 79. The Executive order imposed a moratorium on the approval of new mining projects until Congress passes a legislative measure to increase royalty fees. After the order came into effect, the mining industry was at a standstill with about 1,000 applications for new mining contracts put on hold. In early 2013, the Mines and Geosciences Bureau (MGB) announced it would resume accepting applications for exploration permits and FTAA's beginning on March 18. The lifting of the ban does not apply to MPSA's; during 2013, the MGB was still deciding on the course of action regarding the revenue-sharing scheme (Agub, 2013, p. 2; Rappler, 2013b).

Executive Order No. 79 was intended to strengthen the protection of the environment and promote responsible mining and proposed an increase of royalty fees to 5% from 2%. The order also changed the rules for the acquisition of new mining permits by establishing a bidding process rather than the previously used first-come-first-served approach and mandated renegotiation of terms for mining contracts (even those eligible for renewal), which effectively shortened the total maximum agreement period to 25 years from 50 years. Small-scale mining activities were limited to certain areas of the country; also, small-scale mining for metallic minerals was prohibited except for mining of chromite, gold, and silver. In addition, the Executive order prohibited the use of mercury in small-scale mining operations (Aquino, 2012; Andrade, 2012; Mines and Geosciences Bureau, 2012).

Existing mining agreements, concessions, contracts, and projects that were approved before the Executive order was signed are exempted from the new rules; however, the Executive order authorized the Department of Environmental and Natural Resources (DENR) to review all existing mining contracts and renegotiate the contract terms with the contractors. Executive Order No. 79 also proposed the creation of a Mining Industry Coordinating Council (MICC), which would be an interagency body in charge of conducting dialog with stakeholders, reviewing all existing mining-related laws and regulations, conducting public auctions for mining tenements, ensuring that contractors have the proper environmental insurance coverage and perpetual liability, implementing other industry reforms, and supervising the drafting of a new mining law. The council would be integrated by representatives from the Department of Finance, the Department of Trade and Industry, the Mines and Geosciences Bureau, and the National Economic and Development Authority (Aquino, 2012; Mines and Geosciences Bureau, 2012; Mining Weekly, 2012; Agub, 2013, p. 1–3).

The DENR is also in charge of implementing the Extractive Industries Transparency Initiative (EITI), which is an international effort designed to set the standards for transparency in the management of revenue derived from extractive industries, such as mining and oil and natural gas extraction. The initiative is voluntary and requires participating countries to publish the receipts from their extractive mining activities. On May 22, 2013, the EITI International Board admitted the Philippines as a candidate country for its commitment to implement the transparency initiative (Agub, 2013, p. 9; Mines and Geosciences Bureau, 2012).

The Government's shares of mining revenues are acquired from two mining contracts schemes—by way of an excise tax (or mineral royalty) under an MPSA or as a percentage of net revenue through an FTAA. The majority of mining firms operating in the Philippines held an MPSA, from which the state's share is limited to the excise tax, which, as stipulated in the Philippine Mining Act of 1995, consists of 2% of the value of the minerals extracted and an additional 5% royalty tax on mineral state reservations (an indigenous people community share and business tax collected by the local government). Under an FTAA, the state receives no share of the value of the minerals extracted by foreign firms, but only the taxes related to business tax and corporate income tax (Agub, 2013, p. 5; Landingin, 2013; Rappler, 2013a).

During 2013, the Philippine Government met with mining industry representatives while drafting the new mining tax law, the main objective of which is to simplify the more than 20 taxes and fees related to mining activities into fewer payments. The Government considered the implementation of a single excise tax rate of 10% on the gross sale of mineral products, which would replace the 2% excise tax and the 5% mineral state reservations tax. By the end of 2013, the MICC was in the final stages of drafting a bill for new revenue-sharing schemes between the Government and mining companies (Agub, 2013, p. 6; Landingin, 2013).

During 2013, several legislative measures were proposed in the House of Representatives and in the Senate to reform the Filipino mining industry. House Bill 984 proposed that the exploration, development, and use of mineral resources to be

regulated to guarantee the fair distribution of benefits resulting from those activities to indigenous people, local communities, and the state. House Bill 1173 proposed the creation of the Department of Mines, whose role would include the revision of the country's mining industry and the regulations pertaining to that industry. Senate Bill 43 proposed a framework that would support the economy by granting the state at least a 10% share of the gross revenues from each mining development. The shares were to be set aside for the general fund of the Government. Senate Bill 334 sought to mandate that an independent environmental and health assessment be performed for all mining projects. Senate Bill 457 proposed to increase the tax on minerals and quarry resources to 7% from 2%. In addition, Senate Bill 457 called for an equal distribution of the revenue earned from the excise tax among the national and local governments; the bill proposed that 3.5% tax be assigned to the National Treasury and the remaining 3.5% tax (out of the 7% proposed) be assigned to special education funds of the local governments (Agub, 2013, p. 7).

## Production

In 2013, the Philippines produced 446,000 metric tons (t) of nickel, which was an increase of 38.5% compared with the 322,000 t produced in 2012. Other metals for which production increased significantly compared with those of 2012 included manganese (520%), smelted copper (87.5%), and refined copper (72%); in addition, the production of most industrial minerals also increased, including pumice (92%), marble (78%), and silica sand (65%). Production data for mineral fuels were not available; thus the production numbers in table 1 are estimated. The metals for which production decreased in 2013 included iron ore (31%), chromium (28.6%), silver (18.6%), and zinc (14.5%) (table 1).

## Structure of the Mineral Industry

In 2013, an estimated 250,000 people, or 0.7% of the total number of people employed in the country, worked in the mining and quarrying industry. As of October 2013, the job market in the industrial sector was driven mainly by the rapid progression of construction activities, which generated a total of 58,000 jobs in 2013, although the mining sector saw a decline of about 21,000 jobs, mainly as a result of the Government's policy regulating the issuance of new mining permits (Executive Order No. 79). As of February 2014, the Philippines had a total of 755 approved mining tenements distributed as follows—339 MPSAs, 228 industrial sand and gravel permits, 123 mineral processing permits, 55 exploration permits, 6 FTAAAs, and 4 mining lease contracts (Billedo, 2014; Mines and Geosciences Bureau, 2014a; World Bank, The, 2014, p. 12).

Some of the main producers of mineral commodities in the Philippines were CGA Mining Ltd. of Australia (gold and silver), Lafayette Mining Ltd. of Australia (copper, gold, and silver), Lepanto Consolidated Mining Co. of the Philippines (copper, gold, and silver), Nickel Asia Corp. of the Philippines (nickel), Philex Mining Corp. of Canada (copper, gold, and silver), and TVI Resources Development Philippines Inc. (gold and silver), which was the Filipino affiliate of TVI Pacific Inc.

of Canada. The country's major mineral industry facilities are listed in table 2.

## Mineral Trade

In 2013, total trade between the Philippines and the world increased by 4.3% to \$119.1 billion from \$114.2 billion in 2012. The country's total exports were valued at \$56.7 billion compared with \$52.1 billion in 2012, which was an increase of 8.8%; the total value of imports in 2013 increased by about 0.5% to \$62.4 billion from \$62.1 billion in 2012. According to the MGB, in 2013, mineral exports of selected metals from the Philippines amounted to \$2.67 billion and included copper, gold, and nickel. Imports of iron and steel and mineral fuels and related materials were valued at \$14.6 billion in 2013, which was about 23% of the value of the country's total imports (Mines and Geosciences Bureau, 2014c; National Statistics Office of the Philippines, 2014).

In 2013, the leading trading partner of the Philippines was Japan, which accounted for 14.5% (\$17 billion) of the country's total trade, broken down as \$12 billion in exports to Japan and \$5.2 billion in imports from Japan. The second-ranked trading partner was the United States, which accounted for 12.9% of total trade; exports to and imports from the United States were valued at \$8.3 billion and \$7 billion, respectively. The country's third- and fourth-ranked trading partners were China and Singapore, which accounted for 12.7% and 7% of the Philippines' total trade, respectively. Exports to China were valued at \$7 billion, and imports from China were valued at \$8 billion. Exports to Singapore were valued at \$4.1 billion, and imports from Singapore were valued at \$4.2 billion. Total trade with the European Union accounted for \$12.8 billion, which was equivalent to 10.8% of total trade (National Statistics Office of the Philippines, 2014).

Foreign and local investments in the Philippines have decreased significantly in the past several years to about \$160 million in 2012 (the latest year for which information was available) from about \$620 million in 2011 and about \$950 million in 2010. The decrease in investment was most noticeable right after the issuance of Executive Order No. 79. In addition to the freeze in the processing of mining permits applications (mandated by the Executive order), the reduction in investments can also be attributed to uncertainty in areas such as the country's mining policy and the mining taxation requirements (Agub, 2013, p. 3; Landingin, 2013).

## Commodity Review

### Metals

**Copper, Gold, Molybdenum, Silver, and Zinc.**—In 2013, the mined copper production in the country totaled 90,861 t of metal content, which was an increase of about 39% compared with the 65,444 t produced in 2012. The main component of the increase in production was the commencement of commercial production of the Didipio copper and gold mine, which is operated by Oceana Gold Philippines Inc. of Australia. The total copper production for the Didipio facility was 20,986 t in 2013 (table 1; Mines and Geosciences Bureau, 2014b).

On April 1, OceanaGold Corp. of Australia (92% interest) announced the start of commercial production at the Didipio gold and copper project, which is located on the north of Luzon Island in the northern Philippines, approximately 270 kilometers (km) north of the capital city of Manila. OceanaGold estimated a mine life of 15 years and production at full capacity of about 3,100 kilograms per year (kg/yr) of gold (reported as 100,000 troy ounces per year), and 14,000 metric tons per year of copper in concentrate. OceanaGold was expecting to mine the Didipio deposit as an open pit during the first 4 years of mine life and start underground development after the fifth year, and concurrently run the open pit and underground activities until depletion. The project was held under an FTAA between OceanaGold and the Government and covered an area of 129 square kilometers (km<sup>2</sup>). The FTAA allowed OceanaGold to share its net revenue with the Government on a 60–40 basis, of which 60% of the revenue would be the Government's portion. During 2014, pending approval of the FTAA exploration permit, the company planned to drill the adjacent mine prospect of San Pedro, which is located 1.5 km northwest of the Didipio project; other prospects included D'Fox, Mogambos, and Papaya (OceanaGold Corp., 2014, p. 7, 17, 19, 26).

Copper mine output at Philex Mining Corp.'s Padcal copper project was reported to be 14,740 t compared with 10,118 t in 2012 (an increase of 46%); similarly, at Rapu-Rapu Processing Inc.'s polymetallic project, production of copper mine output reached 8,722 t compared with 7,760 t in 2012 (an increase of 12%), and Carmen Copper Corp.'s Toledo copper complex reported production of copper mine output of 41,510 t compared with 40,783 t in 2012 (an increase of about 2%). Copper production decreased at TVI Resources' Canatuan Mine by 28% to 4,902 t from 6,783 t in 2012 (Mines and Geosciences Bureau, 2014b).

Gold production increased by about 18% to 17,248 kilograms (kg) in 2013 from 14,596 kg in 2012 (table 1). Based on gold purchases made by the Bangko Sentral ng Pilipinas (Philippines Central Bank) in 2013, small-scale mines produced 182 kg of gold compared with 596 kg of gold in 2012 (a 69% decrease). At the Padcal copper project, gold production increased by 40% to 3,104 kg in 2013 from 2,218 kg in 2012. Other increases in production were reported at the Toledo copper complex, where the combined production from the Carmen and Lutopan ore bodies reached 651 kg of gold from 426 kg of gold in 2012, an increase of 52.8%. The increase in production at the Toledo complex was mainly the result of improvements implemented in the complex's processing plant (Mines and Geosciences Bureau, 2014b).

Atlas Consolidated Mining and Development Corp. (Atlas Mining) of the Philippines operates the Toledo copper complex through its wholly owned subsidiary Carmen Copper. During 2013, the Toledo complex, which is located in Cebu Province, went through an expansion phase to increase the processing capacity at its mill plant by 50% to 60,000 metric tons per day (t/d) from 40,000 t/d. Along with the expansion at the Toledo complex, the company planned to pursue the development and commercial distribution of the byproducts derived from the processing of copper concentrate, which included magnetite, molybdenum, and pyrite. The installation

of a molybdenum recovery circuit was completed by late 2013, with testing carried out, but the new installation not yet producing as of the end of 2013. The company was expecting to commission the new installation by January 2014. Atlas Mining's exploration group was strongly committed to the exploration of minerals in the area surrounding Carmen Copper's deposit and other areas in the country to discover additional extensions of the deposits near the Carmen and Lutopan ore bodies. Exploration activities included drilling and geologic mapping (Atlas Consolidated Mining and Development Corp., 2014, p. 1, 7, 11–12, 16).

Another property under Atlas Mining was the Diwata gold and copper project, which is located in San Miguel, Surigao del Sur (southern Philippines). In 2013, a memorandum of understanding for the development of the project was signed by all seven villages that will be affected if the project were approved. The company was still waiting for the final approval from the National Commission on Indigenous Peoples. By 2014, the company was expecting to receive other permits that were still pending (Atlas Consolidated Mining and Development Corp., 2014, p. 17).

On November 12, in the wake of Typhoon Haiyan, Glencore plc [the Anglo-Swiss merger between Glencore International plc and Xstrata plc., formerly known as Glencore Xstrata plc (GlencoreXstrata)], announced the copper smelter and refinery plant of its subsidiary Philippine Associated Smelting and Refining Corp. (PASAR), located in Isabel, Leyte Province, had sustained considerable structural damage. Upon inspection, assessment, and repair, the facility was scheduled to open during the first quarter of 2014. A fire in 2012 had previously disrupted the PASAR plant's operations for about 6 months (MetalMiner IndX, 2013; GlencoreXstrata plc, 2014).

TVI Resource Development Philippines Inc. (TVIRD), which owned various mining projects in the country, announced in October 2013 that it had received the environmental compliance certificate for the Balabag gold and silver project. The company was still awaiting the approval of the declaration of mining project feasibility to be issued by the MGB, which would authorize the company to start the development phase. The Balabag project was located in Zamboanga del Sur Province and covered an area of 52 km<sup>2</sup>. Another TVIRD project was the Greater Canatuan Tenement Area property, where, as of the end of 2013, exploratory activities were still suspended pending the approval of permits. Despite the Government's lifting of the moratorium banning the approval of new exploration permits in March, the moratorium was still in effect for MPSAs (TVI Pacific Inc., 2013, p. 9, 11).

On August 13, Sagittarius Mines, Inc. (SMI) [a joint venture between Glencore (62.5%) and Indophil Resources NL (37.5%)], which was the operator of the Tampakan copper and gold project, announced plans to eliminate its budget for the \$5.9 billion project. The Tampakan project is located near Tampakan in South Cotabato Province on southern Mindanao Island. In December 2012, the company delayed the project until 2019 mainly because of the challenges faced since 2010 when South Cotabato Province banned the use of open pit mining as a method to extract mineral resources in the Province following passage of an environmental code that was

implemented in October 2010. In 2013, the DENR issued a mine environmental compliance certificate for the Tampakan copper and gold project as part of its application process (Jamasmie, 2013; Indophil Resources NL, 2014, p. 3, 8).

**Nickel.**—Based on information compiled using trade data, the production of nickel increased by about 39% to 446,000 t in 2013 from 322,000 t in 2012 (table 1).

On April 10, TVIRD announced the release of an updated report and reclassification of the resources estimates for the Agata North nickel laterite project. The report indicated an increase in measured and indicated resources of 33.9 million metric tons (Mt) grading 1.1% nickel from 31.8 Mt grading 1.05% nickel; the total contained nickel was estimated to be 391,000 t. At a cutoff grade of 44% iron, the property had an estimated 7 to 10 Mt of ore grading 48.5% iron and 0.94% nickel. As of the end of 2013, the company was still awaiting the final approval of the declaration of mining project feasibility to be issued by the MGB, before it could proceed to the development phase. In May, TVIRD announced that it had started the initial testing phase for the processing of ore from the Agata North project at the Beijing General Research Institute of Mining and Metallurgy facility located in China. During 2013, TVIRD processed about 30 t of ore at the processing plant; the ore was mainly from a variety of test samples from the Agata ore body. By testing the samples, the company expected to define the technological parameters needed to process Agata's ore. Results from the operations in the pilot plant would serve as the basis for a feasibility study to define the potential to build a commercial processing plant (TVI Pacific Inc., 2013, p. 13).

On September 13, Intex Resources ASA of Norway announced its commitment to invest \$2.8 billion in the development of the Mindoro nickel project, which would be located on Mindoro Island and would process low-grade lateritic nickel ore to produce nickel metal. In January 2012, Intex partnered, through a memorandum of understanding, with MCC8 Group Co. Ltd. of China for the construction of the first refined nickel plant in the Philippines (Olchondra, 2013).

### ***Industrial Minerals***

**Cement.**—In 2013, the production of cement in the Philippines increased by about 6.6% to 20.2 Mt from 18.9 Mt (table 1). In June, Holcim Philippines Inc. (a subsidiary of Holcim Ltd. of Switzerland) announced its plans to invest about \$350 to \$450 million in a new plant with a production capacity of 2 million metric tons per year (Mt/yr) of cement to be located in Norzagaray, Balucan, near Quezon City on Luzon Island. The new plant was expected to be commissioned in 2016. In addition, Holcim started reactivating other facilities that were on care-and-maintenance status, including a plant located in Calaca, Batangas, and a grinding plant in Mabini (International Cement Review, 2013a).

San Miguel Corp. (SMC) announced in July its plans to invest \$750 million to upgrade and expand Northern Cement Corp. (NCC) and the construction of new cement plants. The company planned to use \$250 million to increase the capacity at NCC, which is located at Pangasinan in northern Philippines; \$250 million to build a new plant on southern Luzon Island; and

\$250 million for a new plant in Cebu Province in south-central Philippines (International Cement Review, 2013b).

## Outlook

After Executive Order No. 79—which was implemented to restructure the country’s mining industry—came into effect in mid-2012, the mining industry was at a standstill, as about 1,000 applications for new mining contracts and exploration permits were put on hold. Although MGB resumed accepting applications for exploration permits and FTAs in March, the industry remained slow, as regulatory changes caused an atmosphere of uncertainty among foreign investors. The lifting of the ban included some limitations, as it did not include the approval for MPSAs. As the Philippines legislature works on the drafting of a bill for a new revenue-sharing scheme between the Government and mining companies, different groups, such as the Senate Economic Planning Office, are also proposing that the Government mandate investors to move towards setting up more domestic processing facilities in order to increase revenues by increasing foreign investment opportunities and lowering transportation costs.

In the next several years, several mining investment projects that started in 2012 and 2013 are expected to be commissioned. Among the projects are the Holcim Philippines Norzagaray cement plant project (2016) and the Tampakan copper and gold project (2019). Other companies, such as Atlas Mining and TVIRD, are committed to the exploration of the areas surrounding their properties (the Carmen Copper and Canatuan facilities, respectively) in search of new mining prospects.

The increase in cement production in 2013 could be attributed to growth in the construction sector, in part as a result of the Government’s push for infrastructure improvement. During the next few years, it is expected that production from the cement industry will increase as new plants become commissioned and as the country rebuilds and rehabilitates infrastructure destroyed or damaged by the many natural disasters that affected the Philippines during 2013.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013
<b>METALS</b>					
Chromium, chromite, gross weight	14,322	14,807	25,483	36,628	26,164
Cobalt, mine output, Co content <sup>3</sup>	1,400 <sup>r,e</sup>	2,100 <sup>r,e</sup>	2,000 <sup>r,e</sup>	2,600	3,000
<b>Copper:</b>					
Mine output, Cu content	49,060	58,412	63,835	65,444	90,861
<b>Metal:</b>					
Smelter	230,100	216,200	205,000	97,000	181,900
Refined	178,000	171,900	164,000	90,400 <sup>r</sup>	155,700
Gold, mine output, Au content kilograms	37,047	40,847	31,120	14,596 <sup>r</sup>	17,248
<b>Iron and steel:</b>					
Iron ore, gross weight	--	--	468,000	1,800,000 <sup>r</sup>	1,300,000
Iron ore, Fe content (62.5%)	--	--	292,608	1,148,232 <sup>r</sup>	793,130
Steel, crude thousand metric tons	824	1,050	1,200	1,260 <sup>r</sup>	1,308
Lead, metal, secondary refined	32,000	30,000	34,000	32,000	32,000 <sup>e</sup>
<b>Manganese:</b>					
Gross weight	8,500	11,300	4,300	500 <sup>r</sup>	3,100
Mn content (43%)	3,600	4,900	1,900	200 <sup>r</sup>	1,300
Nickel, mine output, Ni content <sup>4,5</sup>	119,000 <sup>r</sup>	150,000 <sup>r</sup>	202,000 <sup>r</sup>	322,000 <sup>r</sup>	446,000
Silver, mine output, Ag content kilograms	33,808	41,004	45,530	49,211 <sup>r</sup>	40,043
Zinc, mine output, Zn content	10,035	9,268	18,170	19,559	16,730
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic thousand metric tons	14,865	15,900	16,063	18,907	20,150
<b>Clays:</b>					
Bentonite	1,413	1,475	2,087	2,699 <sup>r</sup>	3,329
Red	7,357	7,050	8,243	9,405 <sup>r</sup>	9,551
White	8,519	8,857	12,246	13,623 <sup>r</sup>	17,532
Other	5,599	5,878	8,143	10,338 <sup>r</sup>	13,560
Feldspar	16,394	15,882	22,050	24,969 <sup>r</sup>	30,388
Lime	4,327	4,524	5,934	6,631 <sup>r</sup>	6,690
Perlite	4,606	4,756	6,272	9,221 <sup>r</sup>	14,249
<b>Phosphate rock:</b>					
Gross weight	2,257	2,308	2,778	2,952 <sup>r</sup>	3,478
P <sub>2</sub> O <sub>5</sub> content	762	779	945	1,004	1,183
Salt, marine	516,066	557,644	720,146	774,815 <sup>r</sup>	992,640

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013	
<b>INDUSTRIAL MINERALS—Continued</b>						
<b>Sand and gravel:</b>						
Silica sand	thousand metric tons	284	296	352	260 <sup>r</sup>	429
Other <sup>6</sup>	thousand cubic meters	46,602	49,009	58,815	66,664 <sup>r</sup>	90,300
<b>Stone:</b>						
Crushed, broken, other <sup>7</sup>	do.	3,069	3,258	4,259	5,502 <sup>r</sup>	6,873
Dolomite		1,176,991	1,259,152	1,431,118	1,627,028 <sup>r</sup>	2,611,853
Limestone <sup>8</sup>	thousand metric tons	33,090	35,540	42,526	53,708 <sup>r</sup>	73,359
Marble, dimension, unfinished	cubic meters	5,629	6,001	8,043	11,311 <sup>r</sup>	20,154
Pumice		2,064	2,274	2,797	2,895 <sup>r</sup>	5,566
Tuff		18,830	19,166	22,106	22,295 <sup>r</sup>	26,930
Volcanic cinder <sup>9</sup>	cubic meters	6,686	7,325	9,219	9,408 <sup>r</sup>	11,292
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal, all grades	thousand metric tons	4,687	6,650	6,881	9,600 <sup>r</sup>	10,732
Gas, natural, gross	million cubic meters	3,909	3,681	3,975	4,000 <sup>e</sup>	4,000 <sup>e</sup>
<b>Petroleum:</b>						
Crude	thousand 42-gallon barrels	2,920	3,059	2,326	2,500 <sup>e</sup>	2,500 <sup>e</sup>
<b>Refinery products:<sup>e</sup></b>						
Liquefied petroleum gas	do.	3,286 <sup>10</sup>	3,500	3,500	3,500	3,500
Gasoline	do.	9,153 <sup>10</sup>	9,000	9,000	9,000	9,000
Jet fuel	do.	46,000	46,000	46,000	46,000	46,000
Kerosene	do.	1,002 <sup>10</sup>	1,000	1,000	1,000	1,000
Distillate fuel oil	do.	17,541 <sup>10</sup>	17,500	17,500	17,500	17,500
Residual fuel oil	do.	10,776 <sup>10</sup>	10,000	10,000	10,000	10,000
Refinery fuel and losses	do.	2,068 <sup>10</sup>	2,000	2,000	2,000	2,000
Other	do.	4,635 <sup>10</sup>	4,500	4,500	4,500	4,500
Total	do.	94,500	93,500	93,500	93,500	93,500

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through October 22, 2014.

<sup>2</sup>In addition to the commodities listed, the Philippines produce platinum-group metals as byproducts of other metal production, quartz, and sulfur, but available information is inadequate to make reliable estimates of output.

<sup>3</sup>The majority of the nickel laterite produced in the Philippines is exported to China, but whether cobalt content is recovered is not known.

<sup>4</sup>Nickel mine output Ni content production, in metric tons, reported by the Government, was 2009—139,744; 2010—184,330; 2011—319,363; 2012—317,621; and 2013—315,633. The numbers in the table have been adjusted to take into account data received from individual company sources as well as trade statistics (see footnote 5).

<sup>5</sup>Data compiled using trade data from the United Nations Comtrade database (<http://comtrade.un.org>) for nickel ores and concentrates (code 2604) exported from the Philippines to Australia, China, and Japan.

<sup>6</sup>Includes "pebbles" and "soil" not further described.

<sup>7</sup>Includes materials described as rock, crushed or broken and blasted; stones, cobbles, and boulders; pebbles; rock aggregates; and broken adobe.

<sup>8</sup>Includes limestone for agriculture, cement manufacturing, industrial use, and other.

<sup>9</sup>Reported as "black cinder" for years 2008–11 by the Philippines Mines and Geosciences Bureau.

<sup>10</sup>Reported figure.

TABLE 2  
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Eagle Cement Co.	Plant located in Akle, San Ildefonso, Bulacan	1,500,000.
Do.	Fortune Cement Corp.	Bulacan plant at Norzagaray, Bulacan Province; Batangas plant at Taysan, Batangas Province	2,100,000.
Do.	Holcim Philippines, Inc.	Bulacan plant at Norzagaray, Bulacan Province; Davao plant at Barrio Ilang, Davao City; La Union plant at Bacnotan, La Union Province; Lugait plant at Lugait, Misamis Oriental Province	7,200,000.
Do.	Solid Cement Corp., APO Cement Corp., and Rizal Cement Corp.	Cement plants at three locations— Naga, Cebu Province (APO Cement Corp.); Antipolo City, Rizal Province (Solid Cement Corp.); Binangonan, Rizal Province (Rizal Cement Corp.)	4,300,000.
Chromite, Cr content	Consolidated Mines Inc. (owner) and Benguet Corp. (operator)	Masinloc chromite mine (Coto chromite deposit) located in Coto, 27 kilometers east of the Port of Masinloc in Zambales Province	5,000.
Do.	Heritage Resources Mining Corp.	Homonhon chromite project	17,000.
Do.	Krominco Inc.	Dinagat chromite project—Redondo Mine (Mt. Redondo deposit) located in the Loreto Municipality, Dinagat Island	26,000.
Copper, Cu content of concentrate	Carmen Copper Corp. (wholly owned by Atlas Consolidated Mining and Development Corp.)	Toledo Copper Complex (Carmen and Lutopan mining) area located in the Central Highlands of Cebu Island	20,000.
Do.	Lafayette Mining Ltd., 75%, and LG International and Korea Resources Corp., 25%	Rapu-Rapu Mine under the Rapu-Rapu polymetallic project, located in Albay Province	36,000.
Do.	Oceana Gold Philippines Inc.	Didipio Copper Gold Project located on the north of Luzon Island in northern Philippines	14,000.
Do.	Philex Mining Corp. (through its subsidiary Philex Gold Inc.), 81%	Padcal copper project located in Tuba, Benguet Province, Luzon Island	21,000.
Do.	TVI Resources Development Philippine Inc., 100%	Canatuan project, located east of Siocon, Zamboanga del Norte Province, Mindanao Island	10,000.
Do.	Glencore International plc.	Philippine Associated Smelting and Refining Corp. (PASAR), located in Isabel, Leyte Province	250,000 smelter; 173,000 refinery.
Gold, Au content	kilograms APEX Mining Company Inc.	APEX Maco operation	100.
Do.	do. CGA Mining Ltd.	Masbate gold project, located 350 kilometers south of Manila, Masbate Island	6,000.
Do.	do. Lafayette Mining Ltd., 75%, and LG International and Korea Resources Corp., 25%	Rapu-Rapu Mine under the Rapu-Rapu polymetallic project, located in Albay Province	1,500.
Do.	do. Lepanto Consolidated Mining Co.	Victoria and Teresa Mines, located in Mankayan, Benguet Province	2,000.
Do.	do. Oceana Gold Philippines Inc.	Didipio copper and gold project, located on the north of Luzon Island in the northern Philippines	3,100.
Do.	do. Philex Mining Corp. (through its subsidiary Philex Gold Inc.), 81%	Padcal Mine (Sto. Tomas II deposit) located in Tuba, Benguet Province, Luzon Island	5,000.
Do.	do. Philippine Mining Development Corp.	Diwalwal Direct State Development Project at Mount Diwalwal in Davao del Norte Province	100.
Do.	do. Philsaga Mining Corp.	Banahaw gold project	NA.
Do.	do. TVI Resources Development Philippine Inc., 100%	Canatuan project, located east of Siocon, Zamboanga del Norte Province, Mindanao Island	500.
Gold, refinery	Bangko Sentral ng Pilipinas	Mint and Refinery Operations Department, located in Quezon City	NA.

See footnotes at end of table.

TABLE 2—Continued  
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nickel, nickel content	CRAU Mineral Resources Corp.	Santa Cruz-Candelaria nickel project, located in Zambales Province	1,000.
Do.	CTP Construction & Mining Corp.	Adlay-Cagdianao-Tandawa (ACT) nickel project, located in Barangay Adlay, Carrascal Municipality, Surigao del Sur Province	10,000.
Do.	Hinatuan Mining Corp.	South Dinagat project, located on Nonoc Island	4,000.
Do.	do.	Tagana-an nickel project, located on Hinatuan Island	30,000.
Do.	Nickel Asia Corp., 100%	Cagdianao nickel project, located near Barangay Valencia on Dinagat Island	10,000.
Do.	Nickel Asia Corp., 65%; Pacific Metals Co. Ltd., 33.5%; Sojitz Philippines, 1.5%	Claver nickel project (Taganito), located in Surigao del Norte Province, Mindanao Island	16,000.
Do.	Nickel Asia Corp., 60%; Pacific Metals Co. Ltd., 36%; Sojitz Philippines, 4%	Rio Tuba nickel project, located in Barrio Rio Tuba, Bataraza Municipality in Palawan Province	5,000.
Do.	SR Metals, Inc.	SR nickel project, Tubay Mine, located in Tubay, Agusan del Norte Province	25,000.
Do.	Toledo Mining Corp. Plc., 56.1%	Berong nickel project, located on Palawan Island	10,000.
Nickel, mine and plant	Coral Bay Nickel Corp. (Sumitomo Metal Mining Co. Ltd., 54%; Mitsui & Co. Ltd. 18%; Rio Tuba Nickel Mining Corp., 10%; Nickel Asia Corp., 6%)	Coral Bay nickel high pressure acid-leach (HPAL) plant, located on Palawan Island	24,000 nickel, 1,800 cobalt.
Petroleum, refinery	Petron Corp.	Limay, Bataan	3,650.
thousand 42-gallon barrels			
Silver, Ag content	Lafayette Mining Ltd., 75%, and LG International and Korea Resources Corp., 25%	Rapu-Rapu Mine under the Rapu-Rapu polymetallic project, located in Albay Province	18,000.
Do.	do.	Lepanto Consolidated Mining Co.	Victoria and Teresa Mines, located in Mankayan, Benguet Province
Do.	do.	Philex Mining Corp. (through its subsidiary Philex Gold Inc.), 81%	Padcal Mine (Santo Tomas II deposit), located in Tuba, Benguet Province, Luzon Island
Do.	do.	TVI Resources Development Philippine Inc., 100%	Canatuan project, located east of Siocon, Zamboanga del Norte Province, Mindanao Island
Zinc	Lafayette Mining Ltd., 75%, and LG International and Korea Resources Corp., 25%	Rapu-Rapu Mine under the Rapu-Rapu polymetallic project, located in Albay Province	8,000.

Do., do. Ditto. NA Not available.