



# 2020–2021 Minerals Yearbook

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**VIETNAM [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF VIETNAM

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**Note: In this chapter, information for 2020 is followed by information for 2021.**

In 2020, Vietnam was the 2d-ranked producer of tungsten in the world, accounting for 5.7% of global production and 2.7% of the world's reserves; the 3d-ranked producer of cement, accounting for 2.3% of global production; the 5th-ranked producer of fluorspar, accounting for 2.7% of global production and 1.6% of the world's reserves; the 5th-ranked producer of clinker, accounting for an estimated 2.4% of global production; the 9th-ranked producer of rare earths, accounting for 0.29% of global production and 18% of the world's reserves; and the 11th-ranked producer of bauxite, accounting for 0.90% of global production and 18% of the world's reserves. Other mineral commodities produced in the country included antimony, barite, bismuth, coal, copper, iron ore, lead, manganese, natural gas, nitrogen (ammonia), crude and refined petroleum, phosphate rock, salt, tin, titanium, zinc, and zirconium. Vietnam also produced processed metals, such as refined copper, refined lead, raw steel, steel products, refined tin, and smelted zinc. A list of commodities produced in Vietnam can be found in table 1 (Bray, 2022; Cordier, 2022; Hatfield, 2022; McRae, 2022; Shedd, 2022).

## Minerals in the National Economy

In 2020, the country's real gross domestic product (GDP) increased by 2.9% compared with an increase of 7.4% in 2019. The nominal GDP in 2020 was \$347 billion.<sup>1</sup> The output of the mining and quarrying sector, in terms of value, decreased by 6.7% and accounted for 2.4% of the GDP in 2020. The sector's contribution to the GDP decreased for eight consecutive years from 11.4% in 2012. The mining and quarrying sector employed 174,000 people, which accounted for 0.32% of the country's total labor force in 2020, compared with 197,900 people in 2019 (General Statistics Office of Vietnam, 2015, p. 152; 2017, p. 172; 2022, p. 149, 191, 196, 198).

In 2020, 684 new mining and quarrying enterprises were established and the number of active enterprises in the mining and quarrying sector increased by 3.0% to 5,257, accounting for 0.77% of country's total active enterprises. In 2020, active enterprises that had 100% foreign direct investment (FDI) accounted for 2.18% of the total active enterprises, and joint ventures accounted for 0.44% of the country's total active enterprises. A foreign-owned, \$23 million crude petroleum project was licensed in 2020. As of December 2020, the number of licensed mining and quarrying projects funded through FDI was 108 and accounted for 0.33% of country's total licensed projects funded through FDI. The FDI in the mining and quarrying sector was valued at \$4.9 billion, accounting for

1.3% of the total FDI in the country in 2020. Table 2 is a list of major mineral industry facilities (Deshmukh, 2021; General Statistics Office of Vietnam, 2021, p. 279, 285; 2022, p. 323, 326, 331).

## Government Policies and Programs

The Vietnamese National Assembly adopted the 2010 Mineral Law (No. 60/2010/QH12) in November 2010. It became effective as of July 2011 and replaced the 1996 Mineral Law (VNM-1996-L-73762) as amended by law No. 46/2005/QH11 in 2005. The 2010 Mineral Law supplemented the existing legal framework for mineral exploration and mining, streamlined the licensing process, and imposed more stringent financial requirements for obtaining mineral licenses (Thao and Harrison, 2017; International Labor Organization, 2020).

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the European Union-Vietnam Free Trade Agreement (EVFTA) came into effect in January and August 2020, respectively. The tariff reduction through these agreements was expected to facilitate the expansion of Vietnam's industries and trade (Vietnam National Coal Mineral Industries Group, 2019b; Eurometal.net, 2020).

## Production

In 2020, mineral commodities for which output increased by 10% or more included zirconium (zircon concentrate), 77% (estimated); steel products, 42%; pig iron, 27%; titanium (mineral concentrate), 24%; salt, 20%; manganese (mine, Mn content) and raw steel, 14% each; and lead (mine, Pb content), 11%. Production of jet fuel decreased by 64%; phosphate rock (gross weight), 55%; rare earths (rare-earth-oxide equivalent), 47% (estimated); iron ore (Fe content), 42%; antimony (mine, estimated Sb content) and sand (construction), 23% each; stone (crushed), 22%; liquefied petroleum gas (LPG), 20%; fuel oil, 19%; gravel (construction), 15%; crude petroleum and nitrogen (ammonia, N content), 13% each; and natural gas, 10%. Data on mineral production are in table 1.

## Structure of the Mineral Industry

The mineral industry was dominated by state-owned enterprises, such as Vietnam National Coal and Mineral Industries Group (VINACOMIN) and Dong Bac Corp. Most foreign enterprises invested in and (or) operated gasfields, oilfields, and refineries in joint venture with state-owned Vietnam Oil and Gas Group (PetroVietnam). Table 2 is a list of major mineral industry facilities.

<sup>1</sup>Where necessary, values have been converted from Vietnam dong (VND) to U.S. dollars (US\$) at the annual average exchange rates of VND23,198=US\$1.00 for 2020 and VND23,164=US\$1.00 for 2021.

## Mineral Trade

In 2020, the total value of goods exports increased by 6.9% to \$283 billion. Exports of precious stones, precious metals, and articles thereof increased by 29% to \$2.67 billion; iron and steel, by 25% to \$5.26 billion [the quantity was 9.86 million metric tons (Mt)]; and other base metal and products thereof, by 5.7% to \$2.72 billion. Exports of petroleum products decreased by 53% to \$957 million [the quantity was 18.1 million barrels (Mbbbl)]; coal, by 29% to \$119 million [approximately 910,000 metric tons (t)]; crude petroleum, by 23% to \$1.57 billion (34.1 Mbbbl); and iron and steel products, by 7.9% to \$3.05 billion. Vietnam's main partners for goods exports in 2020 were the United States, which received 27% of Vietnam's total exports, in terms of value; China, 17%; Japan and the Republic of Korea, 6.8% each; and Hong Kong Special Administrative Region of China, 3.7% (General Department of Customs, 2021a; General Statistics Office of Vietnam, 2022, p. 633, 635).

In 2020, the total value of goods imports increased by 3.7% to \$263 billion. The value of ores and other mineral commodity imports increased by 23% to \$1.89 billion (19.4 Mt in terms of quantity), and iron and steel products, by 11% to \$4.54 billion. The import value of petroleum products decreased by 46% to \$3.33 billion (66.0 Mbbbl in terms of quantity, which was an 18% decrease); iron and steel, by 15.2% to \$8.07 billion (13.3 Mt); precious stones, precious metals, and articles thereof, by 15% to \$650 million; and other base metal products, by 11% to \$1.43 billion. In 2020, the country's main import partners for goods overall were China, which supplied 32% of Vietnam's total imports, in terms of value; the Republic of Korea, 18%; Japan, 7.8%; Taiwan, 6.4%; and the United States, 5.2% (General Department of Customs, 2021b; General Statistics Office of Vietnam, 2022, p. 643, 645).

## Commodity Review

### Metals

**Bauxite and Alumina.**—In 2020, Vietnam produced approximately 1.42 Mt of alumina, which was an increase of 4.2% compared with that of 2019. Lam Dong Aluminum Co. Ltd. (LDA; wholly owned by VINACOMIN) produced 707,200 t of alumina in 2020, which was a 3.1% increase from that in 2019. Dak Nong Aluminum Co. Ltd. (DNA; also owned by VINACOMIN) produced 715,268 t of alumina in 2020, which was an increase of 4.6% (table 1; Vietnam National Coal Mineral Industries Group, 2021a, b).

**Copper.**—Vietnam's production of mined copper (Cu content) increased by 5% to 30,800 t (estimated) in 2020. The increase was likely attributable to the ramping up of production at Dong Ta Phoi JSC's Ta Phoi copper mine, which commenced operations at yearend 2018. The mine had 11 Mt of reserves and was expected to produce approximately 40,200 metric tons per year (t/yr) of copper concentrate grading 21.2% copper for about 12 years. Sin Queyen-Lao Cai Copper Mining Co., which was a wholly owned subsidiary of VINACOMIN - Minerals Holding Corp. (VIMICO), produced 68,714 t of copper concentrate grading 25% copper. Nui Phao Mining Co. Ltd., which was a

wholly owned subsidiary of Masan High-Tech Materials Corp. (formerly Masan Resources Corp.), produced 9,061 t of mined copper (Cu content), which was a 13% increase compared with that in 2019 owing to an increased ore grade in 2020 (table 1; Taichinh Vietnam Online, 2019; Vietnam National Coal Mineral Industries Group, 2019a; Masan High-Tech Materials Corp., 2021, p. 18; Sin Queyen-Lao Cai Copper Mining Co., 2021).

**Iron and Steel.**—In 2020, Hoa Phat Group JSC, which had a steel product market share of about 33% in Vietnam, produced 5.8 Mt of raw steel, 3.4 Mt of structural steel products for construction, 1.7 Mt of billet, and 700,000 t of hot-rolled coil. The hot-rolled coil was produced for the first time at the No. 3 blast furnace (which commenced operations in August) at Hoa Phat Group's Dung Quat Iron and Steel Integrated Complex, Quang Ngai Province; the complex had a production capacity of approximately 4.7 million metric tons per year (Mt/yr) of raw steel. Hoa Phat Group had the largest market shares in Vietnam for structural steel products for construction (32.5%) and steel pipes (31.7%) in 2020. Hoa Phat imported more than \$700 million worth of goods, including coal and iron ore, from Australia for 11 months of 2020. Specifically, the company imported \$364 million of coal and \$123 million of iron ore to reduce the input cost for its iron and steel integrated complexes in Quang Ngai and Hai Duong Provinces (table 1; Hoa Phat Group JSC, 2020; 2021a, p. 12; 2021b; SteelOrbis, 2020; Vietnamplus, 2020).

In 2020, Hoa Sen Group JSC produced 1.62 Mt of sheet coil and pipes for construction. In August, the company abandoned a 16-Mt/yr-capacity steel complex project in Ninh Thuan Province that had been under construction since 2017. The reason for Hoa Sen Group's abandonment of the project was likely the availability of imports of inexpensive Chinese steel and the opposition of local residents to the project (Onishi, 2020; Thu, 2020).

The average price of Vietnam's steel exports decreased by 15.5%, to \$533 per metric ton in 2020 compared with that in 2019 owing to low global demand amid the coronavirus disease 2019 (COVID-19) pandemic. The amount of Vietnam's iron and steel exports, however, increased by 47.9% to 9.86 Mt in 2020. Of this amount, China accounted for 3.54 Mt; Cambodia, 1.56 Mt; and Thailand, 675,000 t. Vietnam's imports of iron and steel decreased by 9% to 13.3 Mt owing to low domestic demand. Viet Trung Metallurgy and Mineral Co. Ltd. (VTM), which was a subsidiary of the Vietnam Steel Corp. and located close to the border between Vietnam and China, relied heavily on imports of equipment and raw materials from China; the company was significantly affected by the lockdown and halted trade during the COVID-19 pandemic (Vietnam News, 2020a; Xinhuanet, 2020; General Department of Customs, 2021a; Hai, 2021).

**Nickel.**—Vietnam had not produced mined nickel since 2017. In April, Blackstone Minerals Ltd. of Australia acquired a 90% interest of the Ta Khoa nickel-platinum-group-elements (PGE) project from Decklar Resources Inc. (formerly Asian Mineral Resources Ltd.). In August, Blackstone doubled its exploration capacity to simultaneously explore for massive sulfide vein deposits at the Ban Chang prospect and down-dip extensions of the King Cobra Discovery Zone at Ban Phuc.

According to the completed scoping study, the Ban Phuc disseminated sulfide deposit had indicated resources of 44.3 Mt grading 0.52% nickel and inferred resources of 14.3 Mt grading 0.35% nickel. Once completed, the project would have the capacity to process 450,000 t/yr of ore and produce of 12,700 t/yr of nickel (Ni content) during a mine life of approximately 8.5 years (table 1; Blackstone Minerals Ltd., 2020, p. 3; Cowell, 2020; Melanko, 2020; Decklar Resources Inc., 2021).

**Tin.**—Vietnam's production of mined tin (Sn content) and smelted tin in 2020 was estimated to have decreased by 2% to 5,400 t and 4% to 4,600 t, respectively. In March, VIMICO divested its 60.93% interest of Nghe Tinh Nonferrous Metals JSC, which operated the Suoi Bac tin mine in Quy Hop, Nghe An Province. The mine had reserves of 427,500 t and the capacity to produce 15,000 t/yr of ore. As of yearend 2020, Thai Nguyen Import Export JSC had a 27.26% interest in Nghe Tinh Nonferrous Metals and 18 other investors shared the remaining equity interest (table 1; Vietnam National Coal Mineral Industries Group, 2020a, b; Vietstock, 2021).

**Tungsten.**—According to Masan High-Tech, its wholly owned subsidiary Nui Phao Mining Co. Ltd. (NPMC) produced 4,225 t of tungsten (mine, W content) in 2020. Masan Tungsten LLC, which was another wholly owned subsidiary of Masan High-Tech, produced 10,171 t of ammonia paratungstate (WO<sub>3</sub> content) tungsten intermediate in 2020, which was a 67.5% increase compared with that in 2019. The increase was attributed to the additional production from H.C. Starck Holding of Germany, which Masan High-Tech acquired in June. In October, Mitsubishi Materials Corp. of Japan obtained a 10% equity share of Masan High-Tech (table 1; Masan High-Tech Materials Corp., 2021, p. 18, 21, 22).

**Zirconium.**—GPM Binh Thuan Ltd. used a wet mining method (dredging beach sand) to produce heavy minerals, including ilmenite, monazite, rutile, and zircon, and had a 200,000-t/yr capacity as of 2020. Vietnam Rare Element Chemical JSC (VREC), which was a subsidiary of Daiichi Kigenso Kagaku Kogyo Co. Ltd. of Japan, was engaged in zircon ore processing and had the capacity to produce 13,300 t/yr of zirconium oxychloride (ZOC). Daiichi planned to increase VREC's production capacity through an expansion project, which was expected to be completed in 2023 (tables 1, 2; Vietnam Investment Review, 2014; Japan Bank of International Cooperation, 2019; Daiichi Kigenso Kagaku Kogyo Co. Ltd., 2021, p. 3; East Minerals, 2021).

### **Industrial Minerals**

**Cement.**—In 2020, Vietnam's cement production increased by 6.4% to about 112.3 Mt. Vietnam exported 38.4 Mt of clinker and cement, which was an increase of 13.7% from that in 2019. The exports totaled \$1.44 billion, which was an increase of 3.2%. Vietnam's cement production facilities included 66 integrated plants, 22 grinding plants, and 1 clinker plant. In 2020, the Long Son cement plant was in the process of expanding its production capacity to 7.0 Mt/yr from 2.5 Mt/yr (table 1; Global Cement, 2020a; CemNet.com, 2021; General Department of Customs, 2021a).

In August, the Government announced a strategy for development of the cement industry, to be applicable to all plants with capacities below 900,000 t/yr. Plants with capacities below 900,000 t/yr were required to improve their productivity, quality, energy efficiency, and environmental protection by 2025 in order to remain in business. Approximately 70% of cement plants in Vietnam had production of less than 1 Mt/yr each, and these plants accounted for about 20% of the country's total cement production. In November, the Quang Ninh provincial government ordered the Ha Long cement plant (which had a capacity of 2.0 Mt/yr) and the Thang Long cement plant (capacity of 2.3 Mt/yr) to close by 2030 to protect the local environment (Global Cement, 2020b, c; 2021).

### **Mineral Fuels and Related Materials**

**Coal.**—In 2020, Vietnam produced 44.6 Mt of coal, which was a decrease of 5.4% from production in 2019. VINACOMIN produced 38.5 Mt, which accounted for 86% of national coal production. Vietnam imported 54.8 Mt of coal, which was an increase of 25.2%; the coal came predominantly from Australia and Indonesia. In terms of value, however, imports of coal decreased by 0.3% owing to low market price amid the COVID-19 pandemic. The National Steering Committee for Electricity Development planned to reduce the energy produced from coal-fired thermal powerplants by approximately 35,000 megawatts (MW) by 2030. However, the Institute of Energy Economics and Financial Analysis expected that Vietnam would continue with the development of 15 coal-fired powerplant projects that would have a total installed capacity of 15,000 MW by 2026 owing to fast growing power consumption in the country (table 1; Vietnam News, 2020b; Wang and Tan, 2020; General Department of Customs, 2021b; Vietnam National Coal Mineral Industries Group, 2021d; Yang, 2021).

**Petroleum.**—In 2020, Vietnam's crude petroleum production decreased to about 70.7 Mbbl from 81.0 Mbbl in 2019 owing to low oil prices and reduced domestic demand for refined fuels caused by the COVID-19 pandemic. In 2020, the production of Binh Son Refining and Petrochemical JSC (BSR) decreased by 14.7%, including production of jet fuel, by 64%; liquefied petroleum gas, 20%; fuel oil, 19%; gasoline, 11%; and diesel, 10%. Nghi Son Refinery and Petrochemical LLC (NSRP), which had a designed production capacity of 73 million barrels per year, began operating in Thanh Hoa Province on December 23, 2018. Production of NSRP accounted for 33% of domestic consumption of diesel and gasoline in 2019, and its first batch of the Jet A-1 product was sold to the domestic market in August 2020 (table 1; Nghi Son Refinery and Petrochemical LLC, 2019, 2020; Binh Son Refining and Petrochemical JSC, 2020, p. 88; 2021, p. 63; Nguyen, 2020; Vahn and Toh, 2020).

## **MINERAL INDUSTRY HIGHLIGHTS IN 2021**

### **Minerals in the National Economy**

In 2021, the country's real GDP increased by 2.6% and the nominal GDP was \$366 billion. The output of the mining and quarrying sector decreased by 7.8% in 2021, and the sector

accounted for 2.44% of the GDP. In 2021, 647 mining and quarrying enterprises were newly established and the number of active enterprises in the mining and quarrying sector increased by 3.0% to 5,416. The mining and quarrying sector employed 175,100 people, which accounted for 0.36% of the total labor force in 2021 (General Statistics Office of Vietnam, 2022, p. 149, 191, 196, 198, 323, 326).

Vietnam's trade in 2021 reflected an economic recovery from the COVID-19 pandemic, and exports and imports of most mineral commodities increased. In 2021, the total value of exported goods increased by 18.9% to \$336 billion. The value of iron and steel exports increased by 124%; of coal, by 106%; petroleum products, 50%; base metal and products thereof, 38%; iron and steel products, 29%; cement and clinker, 22%; and crude petroleum, 11%. The total value of goods imports in 2021 increased by 26.7% to \$333 billion. The value of ores and other mineral product imports increased by 103%; of ferrous waste and scrap, by 68%; liquefied petroleum gas, 65%; precious stones and metals and products thereof, 56%; iron and steel, 43%; other base metals, 42%; crude petroleum, 37%; petroleum products, 23%; and coal, 18% (General Department of Customs, 2022a, b).

## Production

In 2021, mineral commodities for which output increased by 10% or more included zirconium (zircon concentrate), which increased by 173% (estimated); bismuth (mine, Bi content), 108%; gasoline, 23% (estimated); liquefied petroleum gas, 23%; manganese (mine, Mn content), 21%; pig iron, 20%; diesel and lead (mine, Pb content), 19% (estimated) each; raw steel, 16%; salt, 13%; and steel products, 12%. Production of petroleum products increased owing to the ramping up of production at the Nigh Son Refinery, despite the shutdown in February following a power outage. Production of rare earths (rare-earth-oxide equivalent) decreased by 36% (estimated), and natural gas, by 19%. The significant increase in bismuth production was attributed to the extended maintenance shutdown of the bismuth production circuit at Masan High-Tech in 2020 (table 1; Giam and others, 2022; Masan High-Tech Materials Corp., 2022, p. 18).

## Commodity Review

### Metals

**Copper.**—Mine production of copper in concentrates (Cu content) and smelter and refinery copper production all increased by approximately 9% in 2021. The increased mine output was attributed to a 12% increase in the output of ore at the Sin Quen Mine. A second line at Lao Cai Copper Refining Co. was commenced at the company's refinery in Bat Xat, Lao Cai Province, in September. The new line had a designed production capacity of 20,000 t/yr of refined copper, which increased the total capacity of the refinery to 30,000 t/yr (table 1; Vietnam National Coal Mineral Industries Group, 2021c; General Statistics Office of Vietnam, 2022, p. 252; Masan High-Tech Materials Corp., 2022, p. 18).

**Iron and Steel.**—In 2021, Vietnam's production of most steel-related commodities, including pig iron, raw steel, and steel products, increased. Hoa Phat Group, which produced an estimated 6.7 Mt of raw steel in 2021, was the 59th-ranked global producer, and Formosa Ha Tinh Steel Corp., which produced an estimated 6.5 Mt, was the 61st-ranked global producer. The Dung Quat Iron and Steel Integrated Complex commenced operation of blast furnace No. 4 in January and operated furnaces No. 2 and No. 3 at full capacity in 2021. As a result, Hoa Phat Group's total raw steel output increased to 8 Mt/yr (table 1; Hoa Phat Group JSC, 2022, p. 12, 43; Vietnamplus, 2022a; World Steel Association, 2022).

In 2021, Hoa Binh Group (an Australian subsidiary of Hoa Phat Group) acquired the Roper Valley iron ore project in Northern Territory, Australia, from Al Rawda Resources Ltd. of the United Arab Emirates. The project was on care-and-maintenance status and had estimated reserves of 320 Mt and an anticipated mining capacity of 4 Mt/yr. The investment was part of Hoa Phat Group's efforts to purchase iron mines and coking coal mines in Australia to secure a stable and long-term supply of key steel feedstock (Clark, 2021; Reuters, 2021).

**Nickel.**—In December, Blackstone Minerals restarted mining activity at the Ban Phuc nickel mine, which had been on care-and-maintenance status since 2016. Blackstone Minerals completed renovation of the Ban Phuc concentrator in November 2021 and expected commissioning of the mill and floatation circuit in January 2022. The company also finished a prefeasibility study for a refinery at the Ta Khoa project to produce a nickel-cobalt-manganese battery precursor; the refinery would have a capacity of 85,600 t/yr. The nickel content in the precursor would be 43,500 t/yr (Birney, 2021; Blackstone Minerals Ltd., 2022).

### Mineral Fuels and Related Materials

**Natural Gas and Petroleum.**—In 2021, domestic crude petroleum production decreased by 5.7% to 66.7 Mbbl owing to natural depletion. In 2021, VietSovPetro, which was a joint venture of Vietnam Oil and Gas Group (51%) and Zarubezhneft JSC of Russia (49%), produced 23.2 Mbbl of crude petroleum and 82.3 million cubic meters of natural gas from Block 04–3, which were increases of 5.5% and 7.4%, respectively, from that in 2020. VietSovPetro explored Block 09–1 and added reserves of 16 Mbbl of crude petroleum. It also reported newly identified oil and gas reservoirs of industrial value at Block 16–1/15 in Cuu Long basin (Vahn and Wang, 2022; Vietnamplus, 2022b).

In August, Cuu Long Joint Operating Co., which was a joint venture of PetroVietnam Exploration Production Corp. Ltd. (50%), Perenco plc of the United Kingdom (23.25%), Korea National Oil Corp. (14.25%) and SK Innovation (9%) of the Republic of Korea, and Geopetrol SA of China (3.5%), received the first gas flow from the Su Tu Trang oilfield in Block 15–1. The oilfield's expected reserves were 63 Mbbl of condensate and 5.5 billion cubic meters of natural gas (table 1; Vietnamplus, 2021; Zarubezhneft JSC, 2021, p. 106; General Statistics Office of Vietnam, 2022, p. 252).

## Outlook

In 2022, Vietnam's real GDP is forecasted to increase by 6.0% as a result of the recovery from the renewed wave of the global COVID-19 pandemic that took place in April 2021. Vietnam's mineral industry has faced challenges in recent years, including the continued decrease of mining and quarrying sector output, lower FDI inflow into the mining sector, and the natural depletion of crude petroleum and natural gas resources. Despite these challenges, in the next few years, developments in the mineral industry are expected to include an increase in the mine output of copper and an expanded line at the Lao Cai refinery, restarted production at the Ban Phuc nickel mine, and a steel capacity expansion at the Hoa Phat Group's plant as well as the company's acquisition of iron ore resources overseas. The country's petroleum refinery capacity is expected to increase, and imports of refinery products are expected to decrease as the NSRP refinery continues to ramp up production (Asia Development Bank, 2022, p. 345; International Monetary Fund, 2022).

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

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2017	2018	2019	2020	2021
<b>METALS</b>					
Aluminum:					
Bauxite <sup>c</sup>	2,800,000	3,500,000	3,350,000	3,380,000	3,330,000
Alumina	1,062,000	1,329,000	1,365,000	1,422,000	1,456,000
Antimony, mine:					
Gross weight	576	610	990 <sup>r</sup>	780	763
Sb content <sup>c</sup>	230	240	400 <sup>r</sup>	310	310
Bismuth, mine, Bi content	2,460	2,590 <sup>r</sup>	917 <sup>r</sup>	993	2,067
Chromium, mine, chromite	750	--	--	--	-- <sup>e</sup>
Copper:					
Mine, concentrates:					
Gross weight	85,800	105,000	117,000 <sup>r</sup>	123,000	134,000
Cu content <sup>c</sup>	21,000	26,200	29,200 <sup>r</sup>	30,800	33,600
Smelter, primary	15,800	15,100	19,200	20,200 <sup>e</sup>	22,000 <sup>e</sup>
Refinery, primary	15,800	15,100	19,200	20,200 <sup>e</sup>	22,000 <sup>e</sup>
Gold, mine, Au content	kilograms	557	560 <sup>e</sup>	540	550 <sup>e</sup>
Iron ore, mine:					
Gross weight	thousand metric tons	5,515	5,588	6,106 <sup>r</sup>	3,560
Fe content	do.	2,920	2,962	3,236 <sup>r</sup>	1,890
Iron and steel:					
Pig iron	do.	4,250	8,323 <sup>r</sup>	9,836 <sup>r</sup>	12,500
Steel:					
Raw steel	do.	11,473	15,471 <sup>r</sup>	17,469 <sup>r</sup>	19,900
Products, rolled	do.	17,914 <sup>r</sup>	20,239 <sup>r</sup>	21,969 <sup>r</sup>	31,280
Lead:					
Mine, Pb content <sup>c</sup>	4,560	14,500	12,500	13,900	16,600
Refinery	31,000	32,000	34,000	34,000	35,000
Manganese, mine:					
Gross weight	243,000 <sup>r</sup>	267,000 <sup>r</sup>	246,000 <sup>r</sup>	281,000	341,000
Mn content	105,000 <sup>r</sup>	115,000 <sup>r</sup>	106,000 <sup>r</sup>	121,000	146,000
Rare earths, mineral concentrate: <sup>3</sup>					
Gross weight	360	1,500	2,200 <sup>e</sup>	1,200 <sup>e</sup>	730 <sup>e</sup>
Rare-earth oxide equivalent <sup>c</sup>	220	920	1,300	690	440
Tin:					
Mine, Sn content	5,000	5,500	5,500	5,400 <sup>e</sup>	5,400 <sup>e</sup>
Smelter, primary	4,400	4,900	4,800	4,600 <sup>e</sup>	4,600 <sup>e</sup>
Titanium, mineral concentrate, ilmenite and leucoxene <sup>4</sup>	225,300	235,100	216,700 <sup>r</sup>	268,800	244,400
Tungsten, mine, concentrate, W content	5,400	4,800	4,500	4,225	4,200 <sup>e</sup>
Zinc:					
Mine, Zn content	12,000	12,000	12,000	12,000 <sup>e</sup>	12,000 <sup>e</sup>
Smelter, primary <sup>c</sup>	10,000	10,000	11,000	10,000	10,000
Zirconium, mineral concentrates <sup>e,5</sup>	5,400	11,000	6,200 <sup>r</sup>	11,000	30,000
<b>INDUSTRIAL MINERALS</b>					
Barite	26,000 <sup>e</sup>	NA	NA	NA	NA
Cement, hydraulic	thousand metric tons	81,488	89,121	105,533 <sup>r</sup>	112,283
Fluorspar	234,905	238,702	238,003	219,920	215,027
Nitrogen, ammonia, N content	thousand metric tons	1,100	1,100 <sup>r</sup>	1,150 <sup>r</sup>	1,000
Phosphate rock:					
Gross weight	do.	4,588	4,332	4,490 <sup>r</sup>	2,022
P <sub>2</sub> O <sub>5</sub> content	do.	1,400	1,300	1,350 <sup>r</sup>	607
Salt	do.	649	997	945 <sup>r</sup>	1,135

See footnotes at end of table.

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

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>		2017	2018	2019	2020	2021
METALS						
Stone, sand and gravel, construction:						
Sand and gravel:						
Gravel, including pebbles	thousand metric tons	3,084	2,977	2,966 <sup>r</sup>	2,509	2,542
Sand	do.	96,215	87,148	86,401 <sup>r</sup>	66,106	60,816
Stone, crushed	do.	277,172	269,516	274,222 <sup>r</sup>	214,472	210,820
MINERAL FUELS AND RELATED MATERIALS						
Coal	thousand metric tons	38,409	42,384	47,158 <sup>r</sup>	44,598	48,308
Natural gas	million cubic meters	9,866	10,010	10,200 <sup>r</sup>	9,160	7,460
Petroleum:						
Crude	thousand 42-gallon barrels	99,381 <sup>r</sup>	87,887 <sup>r</sup>	80,952 <sup>r</sup>	70,740	66,708
Refinery:						
Diesel <sup>c</sup>	do.	18,100	22,300	46,600	45,800	54,700
Fuel oil	do.	1,000 <sup>e</sup>	1,000 <sup>e</sup>	1,237	1,003	1,076
Gasoline <sup>c</sup>	do.	29,100	24,300	33,200	31,100	38,300
Jet fuel	do.	3,700 <sup>e</sup>	3,520	4,355	1,551	1,669
Liquefied petroleum gas	do.	6,900 <sup>e</sup>	6,433	5,769	4,620	5,677
Total <sup>c</sup>	do.	58,800 <sup>r</sup>	57,600 <sup>r</sup>	91,200 <sup>r</sup>	84,100	101,000

<sup>c</sup>Estimated. <sup>r</sup>Revised. do. Ditto. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through August 30, 2022. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the commodities listed, bentonite, refractory clay, cobalt, ferroalloys, gemstones, refined gold, granite, graphite, gypsum, kaolin, lignite, lime, marble, nickel, pyrite, pyrophyllite, silica, silver, and sulfur may have been produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>China's imports from Vietnam.

<sup>4</sup>Estimate based on import statistics from trading partners (primarily China and Japan).

<sup>5</sup>Estimated figures based on Vietnam's inferred exports of zirconium ore to China.

TABLE 2  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Alumina	Dak Nong Aluminum Co. [Vietnam National Coal and Mineral Industries Group (VINACOMIN), 100%]	Nhan Co aluminium plant, Dak R'Lap, Dak Nong	720
Do.	Lam Dong Aluminum Co. [Vietnam National Coal and Mineral Industries Group (VINACOMIN), 100%]	Tan Rai bauxite aluminum complex, Bao Lam, Lam Dong	720
Antimony:			
Mine, gross weight	Ha Giang Mechanical and Mineral JSC	Mau Due Mine, Yen Minh, Ha Giang	1
Refinery	do.	Man Due Refinery, Yen Minh, Ha Giang	NA
Barite	NA	Ao Sen deposit, Son Duong, Tuyen Quang	80
Bauxite	Vietnam National Coal and Mineral Industries Group (VINACOMIN)	Tan Rai Mine, Bao Lam, Lam Dong	1,700
Do.	do.	Nhan Co Mine, Dak R'Lap, Dak Nong	1,800
Bismuth	Nui Phao Mining Co. Ltd. (NPMC) [Masan High-Tech Materials Corp., 100%]	Nui Phao Mine, Dai Tu, Thai Nguyen	1
Cement	An Giang Cement Co.	My Thanh Plant, Long Xuyen, An Giang	400
Do.	Cam Pha Cement JSC [Army Telecommunication Industry Group (Viettel), 100%]	Cam Pha Plant, Quang Ninh	2,300
Do.	do.	Cam Pha grinding plant, Ba Ria-Vung Tau	1,480
Do.	Cao Ngan Cement JSC	Cao Ngan Plant, Thai Nguyen	600
Do.	Chinfon Cement Corp. (PT Cemindo Gemilang TBK, 70%, and others, 30%)	Chinfon Plant, Thuy Nguyen, Hai Phong City	4,000
Do.	do.	Hiep Phuoc Plant, Ho Chi Minh City	1,600
Do.	Cong Thanh Cement JSC	Cong Thanh Plant, Tinh Gia, Thanh Hoa	4,700
Do.	do.	Grinding plant, Kinh Mon, Hai Duong	500
Do.	Dong Lam Cement JSC	Dong Lam Plant, Phong Dien, Can Tho	2,000
Do.	FiCO Cement JSC (FiCO-YTL)	DIC Binh Duong Plant, Binh Duong	300
Do.	do.	FiCO Hiep Phuoc Plant, Ho Chi Minh City	1,000
Do.	do.	FiCO Tay Ninh Plant, An Giang	1,500
Do.	Ha Tien Cement JSC [Vietnam Cement Industry Corp. (VICEM), 79.7%, and others, 20.3%]	Binh Phuoc Plant, Binh Phuoc	1,200
Do.	do.	Hiep Phuoc Plant, Ho Chi Minh City	1,200
Do.	do.	Kien Luong Plant, Kien Giang	1,200
Do.	do.	Phu Huu Plant, Ho Chi Minh City	2,600
Do.	He Duong Cement JSC	Ninh Binh Plant, Hoa Lu, Ninh Binh	1,800
Do.	La Hien Cement JSC [VINACOMIN-Viet Bac Mining Industry Corp. (VVBI), 51%, and others, 49%]	La Hien Plant, Thai Nguyen	600
Do.	Long Son Cement Co.	Long Son Plant, Thanh Hoa	7,000
Do.	Luks Cement (Vietnam) Ltd.	Kim Dinh Plant and Ninh Thuan Plant, Thua Thien Hue	2,800
Do.	Mai Son Cement JSC	Son La Plant, Son La	1,000
Do.	Nghi Son Cement Corp. [Taiheiyu Cement Corp., 45.5%; Vietnam Cement Industry Corp. (VICEM), 35%; Mitsubishi Materials Corp., 19.5%]	Nghi Son Plant, Thanh Hoa	4,300
Do.	Phuc Son Cement Co. (Lucky Cement Co., 90%, and Hai Duong Cement Co., 10%)	Phuc Son Plant, Hai Duong	3,600
Do.	Quan Trieu Cement JSC [Viet Bac Mining Industry Holding Corp. (VVBI), 84.9%, and others, 15.1%]	Quan Trieu Plant, Thai Nguyen	820
Do.	Quang Ninh Cement and Construction JSC	Ha Tu Plant and Lam Thach Plant, Quang Ninh	2,100
Do.	Siam City Cement Vietnam Co. Ltd. [Siam City Cement Public Ltd. (SCCC), 65%, and Vietnam Cement Industry Corp. (VICEM), 35%]	Cat Lai Plant, Ho Chi Minh City; Hiep Phuoc Plant, Ho Chi Minh City; Hon Chong Plant, Kien Giang; Nhon Trach Plant, Dong Nai; Thi Vai Plant, Phu My, Ba Ria-Vung Tau	6,300

See footnotes at end of table.

TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Cement—Continued	Song Lam Cement JSC [Vissai Group, 92.5%, and Philecement Corp. (Phinma Group), 7.5%]	Song Lam Plant, Bai Son, Nghe An	6,000
Do.	Tan Quang Cement JSC	Tan Quang Plant, Trang Da, Tuyen Quang	910
Do.	Tan Thang Cement JSC	Thai Nguyen Plant, Quynh Luu, Nghe An	2,000
Do.	Tay Do Cement JSC	Ha Tien 2 Plant, Can Tho City	1,400
Do.	do.	Minh Tam Plant, Hon Quan, Binh Phuoc	4,500
Do.	Thang Long Cement JSC (PT Semen Indonesia, 70%, and others, 30%)	Hiep Phuoc Plant, Ho Chi Minh City, and Thang Long Plant, Quang Ninh	2,300
Do.	Thanh Thang Cement Corp.	Thanh Thang Plant, Thanh Liem, Ha Nam	1,750
Do.	Trung Son Cement JSC	Trung Son Plant, Luong Son, Hoa Binh	2,300
Do.	Tuyen Quang Cement JSC	Tuyen Quang Plant, Yen Son, Tuyen Quang	910
Do.	Vietnam Cement Industry Corp. (VICEM):	Of which:	
	Bim Son Cement JSC	Bim Son Plant, Thanh Hoa	3,800
Do.	But Son Cement JSC	But Son Plant, Ha Nam	3,000
Do.	Ha Long JSC	Ha Long Plant, Ho Chi Minh City	2,000
Do.	Hai Phong Cement Co.	Hai Phong Plant, Ha Giang	1,700
Do.	Hai Van Cement JSC	Hai Van Plant, Da Nang City	600
Do.	Hoang Mai Cement JSC	Hoang Mai Plant, Nghe An	1,400
Do.	Hoang Thach Cement Co. Ltd.	Hoang Thach Plant, Hai Duong	3,500
Do.	Song Thao Cement JSC	Song Thao Plant, Phu Tho	1,000
Do.	Tam Diep Cement Co.	Tam Diep Plant, Ninh Binh	1,400
Do.	Vietnam Construction Materials JSC (Siam Cement and Building Materials Co. Ltd., 100%)	Song Gianh Plant, Tuyen Hoa, Quang Binh	2,000
Do.	do.	Van Hoa Plant, Ho Chi Minh City	1,800
Do.	Vietnam Industrial Construction Corp. (VINAINCON)	Quang Son Plant, Dong Hy, Thai Nguyen	1,500
Do.	Vissai Cement Group:	Of which:	
	Dong Banh Cement JSC	Dong Banh Plant, Lang Son	1,000
Do.	Hoang Phat Vissai Group Co. Ltd.	Ninh Binh Plant, Gia Vien, Ninh Binh	3,600
Do.	Vissai Ha Nam JSC	Ha Nam Plant, Thanh Liem, Ha Nam	3,000
Do.	X18 Cement JSC	Cement X18 plant, Hoa Binh	100
Do.	Xuan Thanh Cement JSC	Bin Phuoc Plant, Hon Quan, Bin Phuoc	3,800
Do.	do.	Ha Nam Plant, Thanh Liem, Ha Nam	5,500
Do.	do.	Quang Nam Plant, Nam Giang, Quang Nam	NA
Do.	Yen Bai Cement and Minerals JSC	Yen Bai Plant, Yen Binh, Yen Bai	350
Chromite, gross weight	Thai Nguyen Nonferrous Metals JSC [VINACOMIN - Minerals Holding Corp. (VIMICO), 51%, and others, 49%]	Mine in Nui Nua, Thanh Hoa	10
Coal:			
Anthracite	Nui Beo Coal JSC [Vietnam National Coal and Mineral Industries Group (VINACOMIN), 65%, and others, 35%]	Mine in Le Thanh Tong, Halong City, Quang Ninh	4,000
Do.	Vietbac Mining Industry Holding Corp. [Vietnam National Coal and Mineral Industries Group (VINACOMIN), 100%]	Nui Hong and Khanh Hoa coal mines, Thai Nguyen	NA
Do.	Vietnam National Coal and Mineral Industries Group (VINACOMIN), 100%	Cam Pha, Cao Son, Coc Sau, Cua Ong, Deo Nai, Dong Trieu, Ha Lam, Ha Tu, Hon Gai, Khe Cham, Mao Khe, Mong Duong, Uong Bi, and Vang Danh coal mines in Quang Ninh	42,000
Lignite	Vietbac Mining Industry Holding Corp. [Vietnam National Coal and Mineral Industries Group (VINACOMIN), 100%]	Na Duong Mine, Loc Binh, Lang Son	NA

See footnotes at end of table.

TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Cobalt, mine, Co content		Ban Phuc Nickel Mines LLC (Blackstone Minerals Ltd., 90%, and Son La Mechanical Engineering JSC, 10%)	Ban Phuc nickel mine, Son La <sup>1</sup>	NA
<b>Copper:</b>				
Mine, concentrate, Cu content		Ban Phuc Nickel Mines LLC (Blackstone Minerals Ltd., 90%, and Son La Mechanical Engineering JSC, 10%)	Ban Phuc nickel mine, Son La	4
Do.		Dong Ta Phoi JSC	Ta Phoi Mine, Lao Cai	9
Do.		Nui Phao Mining Co. Ltd. (NPMC) [Masan High-Tech Materials Corp., 100%]	Nui Phao Mine, Dai Tu, Thai Nguyen	10
Do.		Sin Quyen-Lao Cai Copper Mining Co. [VINACOMIN - Minerals Holding Corp. (VIMICO), 100%]	Sin Quyen copper mine, Ban Vuoc and Coc My, Bat Xat, Lao Cai	20
Do.		do.	Vi Kem copper mine, Bat Xat, Lao Cai	NA
Smelter		Lao Cai Copper Refining Co. [VINACOMIN - Minerals Holding Corp. (VIMICO), 100%]	Lao Cai Smelter, Tang Loong Industrial Park, Bao Thang, Lao Cai	30
Refined		do.	Lao Cai copper refining factory, Ban Qua, Bat Xat, Lao Cai	30
<b>Ferroalloys:</b>				
Ferromanganese		Hai Duong New Resources Metallurgy Shareholding Co. (Golden Resources International Group Corp., 80%; Tan Phu Xuan Shareholdings Co., 10%; Tan An Co. Ltd., 10%)	Plant in Phu Thu, Kinh Mon, Hai Duong	150
Ferrotungsten, W content	metric tons	Asia Tungsten Products (Vietnam) Ltd. (Asia Tungsten Products Co. Ltd., 100%)	Plant in Tan Tien Industrial Zone, Vinh Bao, Hai Phong City	4,000
<b>Fertilizer:</b>				
Nitrogen, ammonia		Mining Chemical Industry Corp. [Vietnam National Coal and Mineral Industries Group (VINACOMIN) 100%]	Ammonium nitrate plant, Thai Tho, Thai Thuy, Thai Binh	NA
Do.		PetroVietnam Fertilizer and Chemicals Corp.	Ca Mau fertilizer plant, Khanh An, Ca Mau	NA
Do.		Vietnam National Chemical Group (VINACHEM): Ha Bac Nitrogenous Fertilizer Factory	Of which: Ha Bac fertilizer plant, Bac Giang	500
Do.		Ninh Binh Nitrogenous Fertiliser One-Member Co. Ltd.	Ninh Binh urea fertilizer plant, Ninh Binh	NA
Do.		Phy My Nitrogenous Fertilizer and Chemical JSC	Plant in Phu My, Ba Ria-Vung Tau	NA
Superphosphate		Lam Thao Fertilizers & Chemicals JSC [Vietnam National Chemical Group (VINACHEM), 100%]	Plant in Lam Thao, Phu Tho	800
Fluorspar		Nui Phao Mining Co. Ltd. (NPMC) [Masan High-Tech Materials Corp., 100%]	Nui Phao Mine, Dai Tu, Thai Nguyen	220
Gas, natural	million cubic meters	Cuu Long Joint Operating Co. [PetroVietnam Exploration Production Corp. Ltd. (PVEP), 50%; Perenco plc, 23.25%; Korea National Oil Corp., 14.25%; SK Erathon Co. Ltd., 9%; Geopetrol SA, 3.5%]	Su Tu Trang offshore field (Block 15-1), Cuu Long Basin	1,000
Do.	do.	Japan Vietnam Petroleum Co. Ltd. (operator), 38.35%; Batavia Oil B.V., 30.5%; PetroVietnam Exploration Production Corp. Ltd. (PVEP), 30%; Mitsubishi Corp., 1.15%	Rang Dong and Phuong Dong offshore oilfields (Block 15-2), Cuu Long Basin	880
Do.	do.	Korean consortium [Korea National Oil Corp. (operator); LG International Corp.; Daesung Industrial Co. Ltd.; Posco Daewoo Corp.; Hyundai Corp.; Seoul City Gas Co. Ltd.], 75%, and Vietnam Oil and Gas Group (PetroVietnam), 25%	Rong Doi oilfield (Block 11-2), Nam Con Son Basin	1,700
Do.	do.	Oil and Natural Gas Corp., 45%; Rosneft Oil Vietnam B.V., 35%; Vietnam Oil and Gas Group (PetroVietnam), 20%	Lan Do and Lan Tay gasfields (Block 6-1), Nam Con Son Basin	3,000
Do.	do.	VietSovPetro (Vietnam Oil and Gas Group, 51%, and Zarubezhneft JSC, 49%)	Bach Ho and Rong offshore oilfields (Block 9-1), Cuu Long Basin	90

See footnotes at end of table.

TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
<b>Gold:</b>				
Mine, Au content	kilograms	Bong Mieu Gold Mining Co. Ltd. (Unnamed owner, 80%; Mineral Development Co., 10%; Quang Nam Mineral JSC, 10%)	Bong Mieu Mine and Nui Kem underground mine, Quang Nam <sup>2</sup>	NA
Do.	do.	Lao Cai Gold JSC [VINACOMIN - Minerals Holding Corp. (VIMICO), 46%, and others, 54%]	Minh Luong Mine, Lao Cai	700
Do.		Phuoc Son Gold Co. Ltd. (Unnamed owner, 85%, and Mien Trung Industrial Co., 15%)	Bai Dat and Bai Go deposits in Phuoc Son gold property, Quang Nam <sup>2</sup>	NA
Refined	kilograms	Lao Cai Copper Smelting Enterprise [VINACOMIN - Minerals Holding Corp. (VIMICO), 100%]	Refinery in Tang Loong Industrial Park, Bao Thang, Lao Cai	700
Graphite		Song Da Lao Cai Mining JSC	Nam Thi Mine, Bao Yen, Lao Cai	NA
Iron ore, mine, Fe content		Thai Nguyen Black Metallurgical JSC	Chom Vung Tay Mine, Dong Hy, Thai Nguyen	NA
Do.		Thai Nguyen Iron and Steel Corp. (TISCO) [Vietnam Steel Corp. (VNSTEEL), 100%]	Nguom Chang Mine, Hoa An, Cao Bang	177
Do.		do.	Thuyen Quang Mine, Yen Son, Tuyen Quang	40
Do.		do.	Tien Bo Mine, Dong Hy, Thai Nguyen	600
Do.		do.	Trai Cau Mine, Dong Hy, Thai Nguyen	180
Do.		Viet Trung Metallurgy and Mineral Co. Ltd.	Quy Xa Mine, Van Ban, Lao Cai	1,600
<b>Lead:</b>				
Mine, concentrate, Pb content		Thai Nguyen Nonferrous Metal JSC	Cho Dien lead-zinc mine, Ban Thi, Na Hang, Tuyen Quang	NA
Refinery		Thye Ming (Vietnam) Industrial Co. Ltd.	Ben Cat refinery, Binh Duong	NA
<b>Manganese:</b>				
Ore, gross weight		Danka Minerals JSC	Toc Tat Mine, Quang Trung, Tra Linh, Cao Bang	NA
Do.		Phuc Son Manganese, Mineral, and Mechanics JSC	Mine in Chiem Hoa, Tuyen Quang	NA
Manganese alloys		Cao Bang Manganese Industry Corp. (Danka Minerals JSC, 25%, and others, 75%)	Plant in Cao Bang	20
Do.		Hai Duong New Resources Metallurgy Shareholding Co. (Golden Resources International Group Corp., 80%; Tan Phu Xuan Shareholdings Co., 10%; Tan An Co. Ltd., 10%)	Plant in Phu Thu Town, Kinh Mon, Hai Duong	150
Nickel, mine, Ni content	metric tons	Ban Phuc Nickel Mines LLC (Blackstone Minerals Ltd., 90%, and Son La Mechanical Engineering JSC, 10%)	Ban Phuc nickel mine, Son La <sup>1</sup>	NA
<b>Petroleum:</b>				
Crude, including condensate	thousand 42-gallon barrels	Chim Sao Crude Oil [Harbour Energy plc (operator), 53.125%; PT Medco Daya Abadi Lestari, 31.875%; PetroVietnam, 15%]	Chim Sao and Dua offshore oilfields, Nam Con Son Basin (Block 12W)	1,800
Do.	do.	Cuu Long Joint Operating Co. [PetroVietnam Exploration Production Corp. Ltd. (PVEP), 50%; Perenco plc, 23.25%; Korea National Oil Corp., 14.25%; SK Innovation, 9%; Geopetrol SA, 3.5%]	Su Tu Trang offshore oilfield (Block 15-1), Cuu Long Basin	16,500
Do.	do.	ONGC Videsh Ltd., 45%; Zarubezhneft EP Vietnam B.V., 35%; Vietnam Oil and Gas Group (PetroVietnam) (operator), 20%	Lan Tay and Lan Do offshore oilfields (Block 6-1), Nam Con Son Basin	15,000
Do.	do.	Korean consortium [Korea National Oil Corp. (operator); LG International Corp.; Daesung Industrial Co. Ltd.; Posco Daewoo Corp.; Hyundai Corp.; Seoul City Gas Co. Ltd.], 75%, and Vietnam Oil and Gas Group (PetroVietnam), 25%	Rong Doi offshore oilfield (Block 11-2), Nam Con Son Basin	3,800

See footnotes at end of table.

TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
<b>Petroleum:—Continued</b>				
Crude—Continued	thousand 42-gallon barrels	Japan Vietnam Petroleum Co. Ltd. (operator), 38.35%; Batavia Oil B.V., 30.5%; PetroVietnam Exploration Production Corp. Ltd. (PVEP), 30%; Mitsubishi Corp., 1.15%	Rang Dong and Phuong Dong offshore oilfields (Block 15–2), Cuu Long Basin	3,500
Do.	do.	VietSovPetro [Vietnam Oil and Gas Group (PetroVietnam), 51%, and Zarubezhneft JSC, 49%]	Bach Ho and Rong offshore oilfields (Block 9–1), Cuu Long Basin	23,000
Do.	do.	Vietnam Oil and Gas Group, 58.05%; Zarubezhneft JSC, 26.95%; Bitexco Group, 15%	Ca Tam oilfield (Block 9–3/12), Cuu Long Basin	3,300
Refined	do.	Binh Son Refining and Petrochemical JSC [Vietnam Oil and Gas Group (PetroVietnam), 50%; ConocoPhillips Co., 23.25%; Korea National Oil Corp., 14.25%; SK Innovation, 9%; Geopetrol SA, 3.5%]	Dung Quat refinery, Quang Ngai	65,700
Do.	do.	Nghi Son Refinery and Petrochemical LLC [Idemitsu Kosan Co. Ltd., 35.1%; Kuwait Petroleum Europe B.V., 35.1%; Vietnam Oil and Gas Group (PetroVietnam), 25.1%; Mitsui Chemical, 4.7%]	Refinery in Nghi Son Economic Zone, Thanh Hoa	73,000
Phosphate rock, gross weight		Vietnam Apatite One Member Co. Ltd. (VINAAPACO) [Vietnam National Chemical Corp. (VNCC), 100%]	Lao Cai Mine and Bac Nhat Son processing plant, Lao Cai	5,500
<b>Rare earths:</b>				
Concentrate	metric tons	Dong Pao Rare Earth Development Co. (Sojitz and Toyota Tsusho Corp., and Lai Chau-VIMICO- Rare Earth JSC)	Dong Pao rare earth mine, Ban Hon, Tam Duong, Lai Chau	1,000
Processing	do.	Shin-Etsu Magnetic Minerals Vietnam Co. Ltd.	Plant in Dinh Vu Industrial Park, Hai Phong City	2,200
Do.	do.	Vietnam Rare Earth Co. Ltd. (VERX) [Shenghe Resources (Singapore), 90%, and Seidou, 10%]	Plant in Bac Ninh Industrial Zone, Bac Ninh	700
Do.	do.	Vietnam Rare Earth JSC (VTRE)	Plant in Lao Cau, Phu Ly City, Ha Nam	4,000
<b>Silica</b>				
Do.		Cam Ranh Sand Co. (FICO)	Thuy Trieu sand deposit, Khanh Hoa	150
Do.		Da Nang Sand Processing Plant (Vico Silica Ltd., 100%)	Nam O sand deposit, Quang Nam	120
Do.		Van Hai Viglacera	Van Hai sand deposit, Quang Binh	200
Do.		Viet Phuong Group	Phong Dien sand mine, Thua Thien Hue	1,000
<b>Steel:</b>				
Raw steel		Cao Bang Iron and Steel JSC	Billet plant, Cao Bang	220
Do.		Formosa Ha Tinh Steel Corp. (FHS) (Formosa Plastic Group, 70%; China Steel Holding, 25%; JFE Steel Corp., 5%)	Plant in Vung Ang Economic Zone, Ky Anh, Ha Tinh	7,100
Do.		Hoa Phat Dung Quat Steel JSC (Hoa Phat Group, 100%)	Steel integrated complex, Quang Ngai	5,200
Do.		Hoa Phat Hai Duong Steel JSC (Hoa Phat Group, 100%)	Steel integrated complex, Hai Duong	2,500
Do.		Hoa Phat Hung Yen Steel Co. Ltd. (Hoa Phat Group)	Plant in Pho Noi A Industrial Zone, Hung Yen	400
Do.		Pomina Steel JSC	Plant in Phu My Industrial Park, Tan Thanh, Ba Ria-Vung Tau	1,500
Do.		Shengli (Vietnam) Special Steel Co. Ltd. [Shengli (Fuzhou) Group Corp., and Guangdong Metals and Minerals Import & Export Corp.]	Billet plant, Cau Nghin Industrial Park, Quynh Phu, Thai Binh	600
Do.		Vietnam Italy Steel JSC (Hai Hung Trade JSC, 65%; Kyoeei Steel, 20%; others, 15%)	Billet plant, Nam Cau Kien Industrial Zone, Hai Phong City	500
Do.		Vietnam Steel Corp. (VNSTEEL)	Plants in Cai Lan, Thai Nguyen, and Phu My, Ba Ria-Vung Tau	1,500
Products		China Steel Sumikin Vietnam JSC [China Steel Corp., 56%; Nippon Steel & Sumitomo Metal Corp., 30%; Formosa Ha Tinh Steel Corp. (FHS), 5%; Nippon Steel & Sumikin Bussan Corp., 5%] (Hoa Phat Group, 100%)	Sheet steel mill, Phu My, Ba Ria-Vung Tau	1,200

See footnotes at end of table.

TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>c</sup>
Steel—Continued			
Products—Continued			
	Formosa Ha Tinh Steel Corp. (FHS) (Formosa Plastic Group, 70%; China Steel Holding, 25%; JFE Steel Corp., 5%)	Hot-rolled coil plant, Vung Ang Economic Zone, Ky Anh, Ha Tinh	5,100
Do.	Hoa Phat Dung Quat Steel JSC (Hoa Phat Group, 100%)	Iron and steel integrated complex, Dung Quat Economic Zone, Quang Ngai	2,000
Do.	Hoa Phat Hai Duong Steel JSC (Hoa Phat Group, 100%)	Iron and steel integrated complex, Kinh Mon, Hai Duong	2,380
Do.	Hoa Phat Hung Yen Steel Co. Ltd. (Hoa Phat Group)	Bar and wire plant, Nhu Quynh Industrial Park, Hung Yen	350
Do.	Hoa Sen Group JSC	Cold-rolled steel plant, Song Than 2 Industrial Zone, Binh Duong	1,650
Do.	Kyoei Steel Vietnam Co. Ltd. (Kyoei Steel Co. Ltd., 60%; Marubeni-Itochu Steel Co. Ltd., and Metal One Corp., 20%; others, 20%)	Plant in Tam Diep, Ninh Binh	450
Do.	Lotus Group	Cold-rolled steel plant, Phu My Industrial Park, Ba Ria-Vung Tau	1,000
Do.	Nam Kim Steel JSC	3 plants in Binh Duong, and 1 plant in Ben Luc, Long An	1,400
Do.	Pomina Steel JSC	Plant 1, Di An, Binh Duong, and Plant 2, Tan Thanh, Ba Ria-Vung Tau	1,500
Do.	POSCO SS VINA (POSCO Group, 100%)	Rolled steel plant, Phu My 2 Industrial Zone, Ba Ria-Vung Tau	1,000
Do.	POSCO-Vietnam (POSCO Group, 100%)	POSCO special steel plant, Phu My Industrial Park, Ba Ria-Vung Tau	3,700
Do.	POSCO VST Corp. (POSCO Group, 100%)	Cold-rolled stainless-steel plant, Nhon Trach 1 Industrial Zone, Nhon Trach, Dong Nai	235
Do.	do.	Bar & wire rod plant, Cau Nghin Industrial Park, Anbai, Quynh Phu, Thai Binh	800
Do.	QH Plus Corp. (Koizumi Co. Ltd., 23%; Nippon Steel & Sumikin Bussan Corp., 10.54%; others, 66.46%)	Construction steel processing plant, Ho Chi Minh City	NA
Do.	Southern Steel Co. Ltd. [Vietnam Steel Corp. (VNSTEEL), 100%]	Rolling mill plant, Phu My 1 Industrial Zone, Tan Thanh, Ba Ria-Vung Tau	400
Do.	Thai Nguyen Iron and Steel JSC (TISCO) [Vietnam Steel Corp. (VNSTEEL), 100%]	Plant in Song Than 1 Industrial Zone, Di An, Binh Duong	150
Do.	Ton Dong A Corp.	Plant in Song Than 1 Industrial Zone, Di An, Binh Duong	150
Do.	do.	Steel sheet plant, Dong An 2 Industrial Park, Binh Duong	250
Do.	Viet Steel Corp.	Bar mill in Ba Ria-Vung Tau	450
Do.	Viet Trung Metallurgy and Mineral Co. Ltd. (VTM)	Lao Cai iron and steel plant, Lao Cai	500
Do.	Vietnam Italy Steel JSC (Kyoei Steel Ltd., 67.7%, and others, 32.3%)	Rolling mill in Pho Noi A Industrial Zone, Giai Pham, Yen My, Hung Yen	300
Do.	Vietnam Japan Steel JSC	Plant in Quan Toan, Hai Phong City	240
Do.	Vietnam Shipbuilding Industry Group (VINASHIN)	Cai Lan steel plate hot-rolling plant, Ha Long, Quang Ninh	1,000
Do.	Vietnam Steel Corp. (VNSTEEL) (Government, 100%)	Plants in Cai Lan, Thai Nguyen, and Phu My, Ba Ria-Vung Tau	2,500
Do.	Vina Kyoei Steel Ltd. Co. [Kyoei Steel Ltd., 45%; Vietnam Steel Corp. (VNSTEEL), 40%; Mitsui & Co. Ltd., 9%; Marubeni-Itochu Steel Co. Ltd., 6%]	Plant in Phu My 1 Industrial Zone, Phu My, Ba Ria-Vung Tau	1,000
Do.	Vina One Steel Manufacturing Corp.	Plant in Ben Luc, Long An	900
Do.	VSC-POSCO Steel Corp. (VPS) [Vietnam Steel Corp. (VSC), and POSCO]	Plants in Cai Lan, Thai Nguyen, and Phu My, Ba Ria-Vung Tau	1,000

See footnotes at end of table.



TABLE 2—Continued  
VIETNAM: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
<b>Tin:</b>				
Mine, concentrate, Sn content		Cao Bang Minerals & Metallurgy JSC	Tinh Tuc tin mine, Tinh Tuc, Cao Bang	NA
Do.		Nghe Tinh Nonferrous Metals JSC (Thai Nguyen Import Export JSC, 27.26%, and others, 72.74%)	Suoi Bac tin mine, Quy Hop, Nghe An	2
Smelter	metric tons	An Vinh Joint Stock Mineral Processing Co.	Smelter in Quy Hop, Nghe An	NA
Do.	do.	Cao Bang Minerals & Metallurgy JSC	Electro-Mechanical Facility, Tinh Tuc City, Cao Bang	310
Do.	do.	Thai Nguyen Mining and Metallurgy Co. Ltd.	Smelter in Thai Nguyen, Thai Nguyen	540
Do.	do.	Tuyen Quang Non-Ferrous Metals JSC [Doanh Tri Co. Ltd., 53.78%, and VINACOMIN - Minerals Holding Corp. (VIMICO), 46.22%]	Smelter in Tan Quang City, Tuyen Quang	NA
Do.	do.	VQB Mineral and Trading Group JSC	Smelter in Hung Yen	1,000
Titanium, ilmenite		Bimal Minerals Co. Ltd. (Malaysia Mining Corp. and Syarikat Pendorong Sdn. Bhd., 60%, and Binh Dinh Minerals Co., 40%)	Mines in Cat Khanh and Qui Nhon, Binh Dinh	70
Do.		East Minerals	Wet mining of heavy minerals from beach sand, Ba Ria-Vung Tau	NA
Do.		Ha Tinh Minerals and Trading Co.	Mines in Cam Hoa; Ky Annh-Cam; Xuyen; Ky Khan; and Ky Ninh, Ha Tinh	450
Do.		Hung Thinh Minerals Investment Co. Ltd.	Mine in Binh Thuan	NA
Do.		Mineral Development Co. No. 4 and No. 5 [VINACOMIN - Minerals Holding Corp. (VIMICO), 51%, and others, 49%]	Mines in Vinh City, Nghe An; Tuy Hoa and Dong Xuan, Phu Yen; Quang Ngan and Vinh My, Thua Thien-Hu	50
Do.		Quang Tri Mineral JSC	Mine in Vinh Linh, Quang Tri	NA
<b>Tungsten:</b>				
Concentrates, W content	metric tons	Nui Phao Mining Co. Ltd. (NPMC) [Masan High-Tech Materials Corp., 100%]	Nui Phao Mine, Thai Nguyen	5,600
Smelter, WO <sub>3</sub> content	do.	Masan Tungsten LLC [Masan High-Tech Materials Corp., 100%]	Ammonium paratungstate plant, Nui Phao, Dai Tu, Thai Nguyen	6,500
<b>Zinc:</b>				
Mine, concentrate, Zn content		Thai Nguyen Nonferrous Metal JSC [VINACOMIN - Minerals Holding Corp. (VIMICO), 51%, and others, 49%]	Cho Dien lead-zinc mine, Ban Thi, Cho Don, Bac Kan	15
Refined		do.	Zinc electrolytic plant, Thai Nguyen Song Cong Industrial Park, Thai Nguyen	12
Do.		Ta Pan Zinc-Lead Plant (a Chinese private firm, 70.2%, and Ha Giang Mineral Exploiting and Engineering Co., 29.8%)	Plant in Lung Vay, Bac Me, Ha Giang	6
<b>Zirconium:</b>				
Mineral concentrates	metric tons	East Minerals	Wet mining of heavy minerals from beach sand, Ba Ria-Vung Tau	NA
Chemical	do.	Vietnam Rare Elements Chemical JSC (Daiichi Kigenso Kagaku Kogyo Co. Ltd.)	Zirconium oxychloride plant, Ba Ria-Vung Tau	13,300
Vanadium, chemical	do.	Tejing (Vietnam) Tungsten Co. Ltd.	Plant in Trang Bang, Tay Ninh Quang	9,300

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>Restarted operations in December 2021.

<sup>2</sup>On care-and-maintenance status in 2021.