



# 2020–2021 Minerals Yearbook

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**TAIWAN [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF TAIWAN

By Jaewon Chung

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

Taiwan has limited mineral resources, including metallic minerals (copper, gold, iron ore, and silver), industrial minerals, natural gas, and crude petroleum. Its processing of minerals (using imported raw materials) played a more significant role in the global mineral industry than the mining of minerals did. In 2020, Taiwan was the world's sixth-ranked importer of metallic ores, slag, and ash, accounting for about 1% (by value) of global imports. It also ranked among the world's major producers of pig iron (10th), raw steel (11th), and refined petroleum products (20th), each representing about 1% of global output (Bureau of Mines, 2021, p. 15; BP p.l.c., 2022, p. 25; Tuck, 2022; Zen Innovations AG, 2022).

## Minerals in the National Economy

In 2020, Taiwan's real gross domestic product (GDP) increased by 3.4% compared with a 3.1% increase in 2019; the nominal GDP was \$669 billion. The manufacturing industry contributed 32% of the GDP; construction, 2.9%; and mining and quarrying, 0.06%. Of the total number of employees (11.5 million), the crude petroleum and natural gas sector employed 1,328, and the mining and quarrying sector employed 1,064 (Bureau of Mines, 2021, p. 23–24; National Statistics, 2022b, p. 2; 2022c, p. 1, 16).

The legislative framework for the mineral sector is provided by the Mining Act of 1930 (amended in 2016) and the Sand and Gravel Excavation Act of 2003. The Government of Taiwan owns all mineral resources. The mineral royalty collected in 2020 was \$3.5 million<sup>1</sup> (TWD104.3 million), showing a continued trend of decreasing from the peak of \$20.8 million in 2013. The decline resulted from the decreased prices of raw materials and mineral fuels and the decreased production quantity (Ministry of Justice, 2016; Bureau of Mines, 2021, p. 15, 22–23).

Taiwan's exports of goods increased by 5% to \$345 billion in 2020. Major mineral exports were iron and steel (valued at \$7.5 billion) and mineral fuels (mostly refined petroleum products valued at \$6.2 billion). Taiwan's imports of goods totaled \$286 billion, which was about the same as in 2019; the major mineral imports were mineral fuels, including coal, liquefied natural gas, and crude and refined petroleum (\$29.6 billion); iron and steel (\$7.2 billion); and metallic ores, slag, and ash (\$3.3 billion) (Bureau of Foreign Trade, 2022).

## Production

In 2020, major increases in production (those greater than 10% compared with production in 2019) included that

<sup>1</sup>Where necessary, values have been converted from Taiwan new dollars (TWD) to U.S. dollars (US\$) at the annual average exchange rates of TWD29.770=US\$1.00 for 2013, TWD29.578=US\$1.00 for 2020, and TWD28.022=US\$1.00 for 2021.

of silica sand, by 102% and serpentine (crushed), 77%. Major decreases in production included that of serpentine (dimension), by 70%; mined gold, 50%; crude petroleum, 42%; limestone (crushed), 33%; distillate fuel oil, 23%; kaolin, 19%; marble (dimension), 18%; natural gas, 17%; and sulfur, 14%. Limestone (dimension) and talc were not produced in 2020. Data on mineral production are in table 1.

## Structure of the Mineral Industry

In 2017, the Government of Taiwan launched the Forward-Looking Infrastructure Development Program to develop a new generation of infrastructure during the next 30 years, including green energy, digital, railway, and community infrastructures. The initial phase between 2017 and 2020 was funded by a special budget of about \$14.9 billion (Executive Yuan, 2021).

The Bureau of Mines administers the mining activity in Taiwan and reports the annual statistics on mines and mineral production. According to the Bureau of Mines (2021, p. 17–18), there were 146 mineral extraction facilities in Taiwan, consisting of 55 marble quarries, 78 other industrial mineral mines and quarries, 9 oil and natural gas fields, and 4 gold mines. Table 2 is a list of major mineral industry facilities.

## Commodity Review

### Metals

**Iron and Steel.**—With no domestic iron ore production, Taiwan imported about 21.2 million metric tons (Mt) of iron ore (valued at \$2.2 billion) in 2020. Australia continued to be the leading iron-ore supplier to Taiwan, accounting for 72% of Taiwan's imports, by value, followed by Brazil (20%) and Canada (7.4%). In 2020, Taiwan's pig iron and raw steel production decreased by 8% to 13.4 Mt and 6% to 21.0 Mt, respectively, owing to the coronavirus disease 2019 (COVID-19) pandemic, the United States-China trade friction that affected China's steel demand, and the lower priced imports of steel products. For the same year, Taiwan exported 10.3 Mt of iron and steel (excluding articles of iron or steel) valued at \$7.5 billion and imported 11.4 Mt valued at \$7.2 billion. The leading recipients of Taiwan's exports of iron and steel were, in order of export value, China (18%) and Vietnam (11%); the leading suppliers to Taiwan were, in order of import value, Japan (26%), Indonesia (15%), and China (13%) (table 1; Mysteel Global, 2020; Zen Innovations AG, 2022).

China Steel Corp., which was Taiwan's leading iron and steelmaker, produced 8.24 Mt of raw steel at its steel plant in Kaohsiung City in 2020 compared with 9.49 Mt in 2019. During the same time period, the company's subsidiary

Dragon Steel Corp. increased its raw steel output to 5.51 Mt from 5.34 Mt in 2019 (tables 2; China Steel Corp., 2021, p. 51; Dragon Steel Corp., 2021, p. 8).

### **Industrial Minerals**

**Cement.**—Owing to insufficient domestic limestone resources and a limited domestic market, many of Taiwan’s cement producers had gradually moved their production bases to China in the late 1990s and expanded their cement output capacities there. For example, as of 2020, Taiwan Cement Corp. (TCC), which was Taiwan’s leading cement producer, was operating cement plants with a combined production capacity of 10.4 million metric tons per year (Mt/yr) in Taiwan, whereas the company’s plants in China had a combined production capacity of 64.3 Mt/yr. Most of Taiwan’s cement plants were located in the northeastern part of the main island and accounted for about 80% of Taiwan’s total production capacity (table 2; Taiwan Cement Corp., 2021, p. 147; Taiwan Cement Manufacturers’ Association, 2022, p. 26–27).

In 2020, Taiwan produced about 11.8 Mt of cement compared with 11.3 Mt in 2019, of which TCC and Asia Cement Corp. accounted for 41% and 32%, respectively. Taiwan’s population was about 23.56 million and consumed about 12.1 Mt of cement in 2020. The per capita consumption of cement was 514 kilograms (kg) in 2020, which was about the same amount as in 2012 and represented a rebound from the 432 kg consumed in 2017. The increase in cement output resulted from the Government’s Forward-Looking Infrastructure Development Program that started in 2017 and ongoing investments from the high-tech industries that had boosted construction activity and strengthened demand for cement (table 1; Taiwan Cement Corp. 2021, p. 138; Taiwan Cement Manufacturers’ Association, 2022, p. 11, 19, 24).

### **Mineral Fuels**

**Coal.**—Taiwan had no domestic coal production and thus depended on imported coal to meet its demand for coal. In 2020, Taiwan imported 63.3 Mt (valued at \$5.1 billion) of coal, which was a decrease of 6% compared with that in 2019; of this amount, in terms of quantity, Australia supplied 48%; Indonesia, 28%; Russia, 17%; and others, 7%. Imported coal consisted of steam coal (which accounted for 71% of the coal imports, in terms of quantity), subbituminous coal (18%), coking coal (10%), and anthracite (0.5%). Taiwan consumed 63.5 Mt of coal in 2020; of this amount, 76% was used for power generation; 13%, for coking; and 9%, for industrial consumption (Bureau of Energy, 2021, p. 44–51, 96).

### **MINERAL INDUSTRY HIGHLIGHTS IN 2021**

In 2021, Taiwan’s real GDP increased by 6.6%, and the nominal GDP was \$775 billion. The manufacturing industry contributed 33% of the GDP; construction, 3.3%; and mining and quarrying, 0.05%. Of the total number of employees (11.4 million), the crude petroleum and natural gas sector employed 1,331, and the mining and quarrying sector employed 1,055 (Bureau of Mines, 2022, p. 23; National Statistics, 2022a; 2022b, p. 2; 2022c, p. 1).

In February, the Government amended Article 36 of the Sand and Gravel Excavation Act of 2003 against illegal sand dredging by foreign vessels. Sand and gravel excavation without permission became subject to a fine of between TWD1 million and 5 million (between \$36,000 and \$180,000), and those performing excavation without permission using vessels or other machinery equipment in the internal waters and the territorial sea are subject to imprisonment for 1 to 7 years and a fine of up to TWD100 million (\$3.6 million) (Ministry of Justice, 2021).

As of 2021, there were 139 mines in Taiwan, consisting of 54 marble quarries, 74 other industrial mineral mines and quarries, 7 oil and natural gas fields, and 4 gold mines. In 2021, major increases in production included that of mica, by 245%; serpentine (dimension), 100%; serpentine (crushed), 36%; lime, 16%; sulfur, 15%; pig iron, 13%; caustic soda, 12%; raw steel, 11%; and refined petroleum products (lubricants), 10%. Major decreases in production included that of kaolin, by 93%; limestone (crushed), 85%; mined gold, 67%; silica sand, 60%; and dolomite (crushed), 25%. Talc production resumed in 2021 (table 1; Bureau of Mines, 2022, p. 17–18).

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TABLE 1  
TAIWAN: 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>						
Gold, mine, Au content	kilograms	4	4	6	3	1
<b>Iron and steel:</b>						
Pig iron	thousand metric tons	14,361	14,841	14,510 <sup>r</sup>	13,441	15,200
<b>Steel:</b>						
Raw steel	do.	22,438	23,240	21,954 <sup>r</sup>	20,959	23,233
Products, rolled	do.	27,664	28,513	26,532 <sup>r</sup>	26,552	27,000 <sup>e</sup>
Lead, refinery, secondary		48,000	58,000	58,000 <sup>r</sup>	55,000	60,000
<b>INDUSTRIAL MINERALS</b>						
Cement, hydraulic	thousand metric tons	10,876	10,939	11,271 <sup>r</sup>	11,786	11,970
Clay, kaolin		1,665	20	500	404	30
Lime		247,468	263,283	294,132	279,907	325,847
Mica		750	2,970	3,312	3,186	10,983
Sand and gravel, industrial, silica		139,274	57,797	70,060	141,780	56,818
Sodium, compounds, caustic soda		1,850,549	1,891,652	1,916,768	1,774,097	1,980,309
<b>Stone, construction:</b>						
<b>Crushed:</b>						
Dolomite		13,357	13,419	18,753	18,065	13,579
Limestone		50	50	704	470	70
Marble	thousand metric tons	15,662	15,637	16,528	16,615	16,741
Serpentine		60,481	83,654	31,205	55,258	75,343
<b>Dimension:</b>						
Limestone		2,940	70	105	--	--
Marble		13,264	13,150	11,425	9,329	9,440
Serpentine		11,591	12,741	5,589	1,702	3,404
Sulfur, byproduct, natural gas and petroleum, S content		173,963	169,698	195,358	167,336	192,227
Talc		--	17	6	--	43
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coke, metallurgical	thousand metric tons	6,056 <sup>r</sup>	6,345 <sup>r</sup>	6,175 <sup>r</sup>	5,955	6,000 <sup>e</sup>
Natural gas	million cubic meters	284	215	190	157	167
<b>Petroleum:</b>						
Crude	thousand 42-gallon barrels	34	29	24	14	15
<b>Refinery:</b>						
Distillate fuel oil	do.	100,707	108,777	112,548	86,479	90,086
Lubricants	do.	1,167	1,179	1,112	1,182	1,304

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through July 14, 2022. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

<sup>2</sup>In addition to the commodities listed, secondary aluminum, refined nickel, and salt may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2  
TAIWAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity <sup>c</sup>
Aluminum, secondary		China Steel Aluminium Corp.	Plant in Kaohsiung City	143
Do.		Sigma Group	do.	70
Cement		Asia Cement Corp.	Hsinchu plant, Hsinchu County	1,000
Do.		do.	Hualien plant, Hualien County	4,000
Do.		Chia Hsin Cement Corp.	Kangsan plant, <sup>1</sup> Kaohsiung County	1,860
Do.		Cheng Tai Cement Co. Ltd.	Kaohsiung plant, Kaohsiung City	400
Do.		Hsin Hsin Cement Enterprise Corp.	Chia I plant, Chiayi County	800
Do.		Hsing Ta Cement Co. Ltd.	Nanshenhu plant, Yilan County	1,600
Do.		Lucky Cement Corp.	Tungao plant, Taoyuan County	2,000
Do.		Ruentex Materials Co. Ltd.	Tungshan plant, Yilan County	1,000
Do.		Southeast Cement Corp.	Kaohsiung plant, Kaohsiung City	1,100
Do.		Taiwan Cement Corp. (TCC)	Hualien plant, Keelung City	1,600
Do.		do.	Hoping plant, Hualien County	5,700
Do.		do.	Suao plant, Yilan County	3,100
Do.		Universal Cement Corp.	Alien plant, Kaohsiung City	800
Gold, mine, Au content	kilograms	NA	4 mines in Yilan County	10
<b>Iron and steel:</b>				
Pig iron		China Steel Corp. (Government, 20.1%, and others, 79.9%)	Plant in Kaohsiung City	10,000
Do.		Dragon Steel Corp. (China Steel Corp., 100%)	Plant in Taichung City	6,200
Raw steel		An Feng Steel Co. Ltd.	Plant in Kaohsiung City	2,000
Do.		China Steel Corp. (Government, 20.1%, and others, 79.9%)	do.	10,000
Do.		Dragon Steel Corp. (China Steel Corp., 100%)	Plant in Taichung City	6,200
Do.		Feng Hsin Iron and Steel Co. Ltd.	do.	1,200
Do.		Hai Kwang Enterprise Corp.	Plant in Kaohsiung City	600
Do.		Tang Eng Stainless Steel Plant	do.	300
Do.		Yieh Hsing Enterprise Co. Ltd.	do.	450
Do.		Yieh Phui Enterprise Co. Ltd.	do.	1,300
Do.		Yieh United Steel Co.	do.	1,000
Lead, metal, secondary		ACME Metal Enterprise Co. Ltd.	Plant in Taipei City	12
Do.		Thye Ming Industrial	Plant in Kaohsiung City	50
Mica		NA	Mine in Taitung County	11
Natural gas	million cubic meters	Chinese Petroleum Corp. (CPC) (Government, 100%)	Gasfields in Chuhuankeng, Guantian, Jinshui, Qingcao Lake, and Mt. Tiezhen areas	200
Nickel, metal		Taiwan Nickel Refining Corp.	Plant <sup>2</sup> in Kaohsiung City	18
<b>Petroleum:</b>				
Crude	thousand 42-gallon barrels	Chinese Petroleum Corp. (CPC) (Government, 100%)	Oilfields in Chuhuankeng and Tungtzuchiao areas	60
Refinery products	thousand 42-gallon barrels per day	do.	Refinery in Chiayi County	300
Do.	do.	do.	Refinery in Taoyuan City	200
Do.	do.	Formosa Plastics Group	Refinery in Yunlin County	450
Salt, refined		Taiyen Biotech Co. Ltd.	Factory in Tongxiao, Miaoli County	100
Sand, silica		NA	26 quarries in Miaoli County	200
<b>Stone:</b>				
Limestone		NA	7 quarries in Hsinchu and Taitung Counties	3
Marble		Hualien Marble Quarry (Retired Servicemen's Engineering Agency)	54 quarries in Hualien and Yilan Counties	20,000
Serpentine		NA	17 quarries in Hualien County	150
Sulfur		China Petrochemical Development Corp.	Dash and Xiaogang plants, Kaohsiung City, and Toufen plant, Toufen City	280

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

<sup>1</sup>Inactive in 2021.

<sup>2</sup>On care-and-maintenance status since 2017.