



2008 Minerals Yearbook

TAIWAN

THE MINISTRY INDUSTRY OF TAIWAN

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Taiwan's economy was oriented towards exports, and its growth prospects depended on the world economy. In 2008, owing to the global financial crisis, external demand for manufactured products decreased, especially during the second half of the year. After growing by an average of 5.4% during the first two quarters of the year, the gross domestic product (GDP) contracted by 1.0% in the third quarter and then by 8.4% in the fourth quarter. For the year, the GDP growth rate was 0.12%, which was the lowest since 2001 when the global demand for information technology decreased. In 2008, exports of goods were valued at \$255 billion, which was a 3.6% increase compared with the value in 2007. The growth was led by chemical, iron and steel, and nonferrous metal products exports. Imports also increased to \$240 billion in 2008, or by 9.7%, compared with an increase of 8.1% in 2007. Coal, oil, and raw materials were the major imported commodities. China was Taiwan's leading trade partner followed by Japan, the United States, and Hong Kong (Directorate General of Budget, Accounting, and Statistics, 2009, p. 3, 39-41).

The Legislative Yuan planned to amend the income tax law. Under the current law, individual investors were required to incorporate their gains from investment in equity into personal consolidated taxable income, but other financial investment gains were taxed at different rates. The ceiling for the personal consolidated income tax rate was 40%. The Ministry of Finance recommended revision of the tax on gains from investment in bonds, repurchase agreements, and short-term bills to a uniform rate of 10%. The rate of the corporate investment tax on financial activities was expected to remain unchanged at 25%. The Legislative Yuan also planned to ratify an energy bill and an energy management bill (China Post, The, 2009a).

Minerals in the National Economy

Major minerals identified on the island included clay, coal, copper, dolomite, feldspar, gold, gypsum, natural gas, petroleum, serpentine, and talc. After several decades of mining, nearly all the recoverable coal, metallic minerals, and talc had been depleted. The output of the mining industry, which had a very small effect on the island's economy, was less than 1% of total industrial production (Directorate General of Budget, Accounting, and Statistics, 2009, p. 22).

Production

The major mining activities in Taiwan were the production of dolomite, limestone, marble, natural gas, and petroleum. Natural gas and petroleum were produced on the western part of the island, and limestone and marble were mined on the eastern part of the island. Employment in mining and quarrying had steadily decreased since the early 1990s to about 5,000 in 2008. The production value of the major mineral commodities was \$390 million, of which \$191 million was from fuels.

Besides natural gas, marble was the island's most valuable mineral commodity. Because Taiwan had no domestic primary aluminum, copper, lead, or zinc smelting capacity, downstream metal producers relied on imports of ingots and scrap to produce products from these metals. Owing to high labor costs, environmental problems, and weak domestic demand, the output of these industries had gradually decreased during the past several years, and companies had moved their manufacturing facilities to mainland China and Southeast Asian countries (Bureau of Mines, 2009; Directorate General of Budget, Accounting, and Statistics, 2009, p. 13).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Iron and Steel.—Taiwan was the 12th ranked crude steel producer in the world and the 5th ranked producer in Asia behind China, Japan, India, and the Republic of Korea. Owing to the increased prices of coking coal, iron and steel scrap, and iron ore and the decline in the prices of steel products during the second half of the year, most of Taiwan's iron and steel companies faced financial losses in 2008. Because of the shortage in supply and the high prices of steel billet, scrap, and rebar in 2007, the Taiwan authorities banned exports of rebar from Taiwan in 2007, although they continued to allow the export of steel scrap. The demand for rebar from the construction sector was weak, however, and rebar was widely available on the island; as a result, steel producers urged the Taiwan authorities to allow them to export rebar freely. Owing to weak demand for rebar, China Steel Corp. (CSC) shut down one of its blast furnaces for care and maintenance in late 2008 (South East Asia Iron and Steel Institute Newsletter, 2008).

CSC was the leading steel producer and the only pig iron producer in Taiwan. In 2008, CSC decided to acquire 100% of the shares of Dragon Steel Corp. Dragon Steel (formerly Kuei Yu Steel Corp.) had an output capacity of 600,000 metric tons per year (t/yr) of H-beam steel and 300,000 t/yr of steel billet, which were cast in a 150-metric-ton (t) twin-shell-type direct current electric arc furnace (EAF). The EAF had an output capacity of 1 million metric tons per year (Mt/yr) of crude steel. The recovery efficiency of products was 91%. With the acquisition of Dragon Steel, CSC would be able to reduce production costs by consolidating material procurement, production, and distribution channels. Dragon Steel installed a "Primus" recycling plant to recover and process iron and zinc dust from the existing furnace. The recycling plant had a capacity of 100,000 t/yr (dry base) of fine material. The multiple-hearth furnace in the recycling plant could be operated

with different feed mixes, ranging from 100% EAF dust to a high proportion of blast furnace residues. CSC planned to construct two blast furnaces at the Dragon Steel site, each of which would be able to produce 2.5 Mt/yr of pig iron. The first blast furnace was scheduled to begin production in December 2009 (South East Asia Iron and Steel Institute Newsletter, 2009).

Taiwan's leading petrochemical producer, Formosa Plastics Group (FPG), had planned to build a 7.5-Mt/yr steel plant at Yunlin Offshore Industrial Zone in Yunlin County in 2004. A feasibility study for the construction of an integrated iron and steel plant was submitted to the Taiwan authorities for approval. In 2006, the Environmental Protection Agency ruled that the environmental-impact report submitted by FPG was inadequate because the report did not specify the source of water to be used nor the amount of carbon dioxide and organic compound emissions; therefore, FPG would be required to conduct more studies on these issues. Facing difficulties on the island, FPG decided to turn its attention to the construction of steel plants in Vietnam. FPG signed a land rental contract with the Vietnamese Government and planned to invest \$8 billion to build an 8-Mt/yr-capacity iron and steel plant at Vung Ang in Ha Tinh Province, Vietnam. The plant would be built in stages. For the first stage, construction of a 4-Mt/yr-capacity iron and steel plant would start in 2009 and was expected to be completed in 50 months (United Daily News, 2008).

Yieh United Group and CSC discussed a sale of shares of the Tang Eng Stainless Steel Plant that were held by CSC. Yieh United Group's subsidiary Yieh United Steel Co. was the leading stainless steel producer in Taiwan, followed by Tang Eng. The Taiwan authorities held the largest shares of both CSC and Tang Eng. During the year, Yieh United Group acquired a 38% share of Tang Eng at the stock exchange market. If Yieh United Group were to acquire CSC's shares of Tank Eng, Yieh United Group would become the largest shareholder of Tang Eng and, as a consequence, would account for more than 60% of the stainless steel output capacity in Taiwan. The acquisition required approval of the Fair Market Committee (United Daily News, 2009).

Industrial Minerals

Cement.—China resumed sand and gravel exports to Taiwan; however, the global financial crisis affected the construction sector on the island. The demand for sand and gravel decreased because much of the island's construction work was postponed in 2008. The delay of construction projects also led to the decrease in cement production. Owing to a lack of limestone resources and a limited market on the island, Taiwan cement producers had gradually moved their production base to China in the late 1990s and expanded their cement output capacities there. Taiwan's leading cement producer [Taiwan Cement Corp. (TCC)] was positioned to take advantage of the market in southern China and to be a high-end cement producer there. TCC's investment strategy in China was to make direct investments and to form joint ventures with local cement producers. TCC planned to invest \$800 million to double its cement production capacity in China by 2012. The total output capacity of TCC's cement plants in China was expected

to increase to 52 Mt/yr in 2010 from 26 Mt/yr in 2008. The company planned to build new plants in each of the Provinces of Fujian, Guangdong, and Guangxi, and each plant would have two kilns. Another Taiwanese cement producer, Asia Cement Corp., also planned to expand its cement production capacity in China by 2 Mt to 11 Mt/yr in 2010. Taiwan's other cement producers also planned to build cement plants in Vietnam (China Post, The, 2009b).

Mineral Fuels

Coal.—Taiwan had no domestic coal production and depended on imported coal to meet its demand for coal. Taiwan Power Co. was the leading coal consumer followed by the cement and iron and steel sectors. In 2008, Taiwan imported 63.8 Mt of coal; of that amount, 53.1 Mt was for power generation and 4.8 Mt was for coking. Steam coal was mainly from, in decreasing order of supply, Australia, Indonesia, and China, and coking coal was from Australia and Canada. The island consumed 62.8 Mt of coal in 2008 (Bureau of Energy, 2009a).

Natural Gas and Petroleum.—With its limited mineral fuel resources, Taiwan produced only about 1.9% of its natural gas and petroleum requirements and relied on imports—mainly through long-term contracts with Indonesia, Malaysia, and Qatar—to fill the gap. Liquefied natural gas (LNG) imports increased by about 8% per year during the past decade. State-owned Chinese Petroleum Corp. (CPC) was the sole LNG importing company. CPC's Taichung LNG receiving terminal was completed in 2007. Domestic natural gas supply was expected to be depleted in 2012. Owing to an increase in domestic demand, Indonesia's LNG exports to Taiwan were expected to be reduced by 50% after the current contract expires in 2009. CPC continued discussions with Woodside Co. of Australia to supply between 2 million and 3 million metric tons per year of LNG for 20 years. Taiwan's LNG consumption for power generation was expected to continue to increase to a projected 20 Mt in 2015 from 9.49 Mt in 2008. In 2008, Taiwan imported a total of 9.0 Mt of LNG from Indonesia, Malaysia and Qatar, which accounted for 73% of total imports (Bureau of Energy, 2009b, p. 27-28).

Outlook

Taiwan's economic growth is heavily dependent on external trade. The slowdown in the economy of the United States and other developed countries in the West is expected to decrease demand for its exports. Economic growth in Taiwan is expected to recover slowly during the next 2 years. The service sector accounts for more than 70% of the GDP and, given the island's limited mineral resources, the mining sector is expected to have only a minimal effect on the island's economy in the future. The growth of manufacturing is likely to be led by the computer, electronics components, and telecommunication products sectors. The island relies on imports of raw materials to support its iron and steel and nonferrous metals sectors. The rising prices of these raw materials could affect producers' profit margins, and tightened environmental regulations may force

nonferrous metal and steel producers to relocate their production facilities to mineral-rich countries with lower labor costs. The island has been gradually transforming from a labor-intensive manufacturing sector to a knowledge-intensive service sector. The Taiwan authorities continue their effort to promote the island as a green island and to ease restrictions on economic ties with China, primarily in the areas of investment, tourism, trade, and transportation. Such changes would likely stimulate growth in the service sector.

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TABLE 1
 TAIWAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity		2004	2005	2006	2007	2008
METALS						
Iron and steel:						
Pig iron	thousand metric tons	10,938	9,854	10,500	10,550	9,800
Steel, crude	do.	19,604	18,567	19,203	20,883	19,222
Nickel, refined ^c		11,000	11,000	11,000	11,000	11,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	19,050	19,891	19,294	18,957	17,330
Feldspar		900	--	--	--	--
Fire clay		3,686	330	125	1,134	745
Lime		493,733	443,879	440,000 ^c	450,000 ^c	450,000 ^c
Mica		2,973	8,608	4,841	3,387	3,179
Nitrogen, liquid		650,359	794,933	800,000 ^c	800,000 ^c	800,000 ^c
Sodium compounds: ^e						
Caustic soda		570,000	570,000	570,000	570,000	570,000
Soda ash		140,000	140,000	140,000	140,000	140,000
Stone:						
Dolomite	thousand metric tons	115	174	61	94	104
Limestone	do.	213	252	351	210	227
Marble	do.	22,970	24,070	25,493	26,452	25,811
Serpentine	do.	229	408	304	280	264
Sulfur		222,670	267,790	245,789	249,156	211,869
Talc		410	--	--	--	--
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	796	548	463	417	357
Marketed ^c	do.	720	490	410	380	310
Petroleum:						
Crude	thousand 42-gallon barrels	280	203	148	112	101
Refinery products	do.	405,400 ^r	409,700 ^r	421,100 ^r	446,800 ^r	420,500

^cEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through June 20, 2009.

TABLE 2
TAIWAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies		Location of main facilities	Annual capacity ^e
Cement	Asia Cement Corp.		Hsinchu	1,800
Do.	do.		Hualien	4,020
Do.	Chia Hsin Cement Corp.		Kaohsiung	1,860
Do.	Chien Tai Cement Co. Ltd.		do.	1,720
Do.	Lucky Cement Corp.		Tungao	2,000
Do.	Southeast Cement Corp.		Kaohsiung	1,090
Do.	do.		Chutung	1,400
Do.	Taiwan Cement Corp.		Hualien City	1,600
Do.	do.		Hualien County	5,600
Do.	do.		Suao	3,400
Do.	Universal Cement Corp.		Kaohsiung	1,550
Marble	Taiwan Marble Co., Ltd.		Panchiao	15
Nickel	Taiwan Nickel Refinery		Kaohsiung	14
Petroleum:				
Crude	thousand 42-gallon barrels per year	Chinese Petroleum Corp.	Chuhuangkeng and Tungtzechiao	850
Refinery products	do.	do.	Kaohsiung	570
Do.	do.	do.	Taoyuan	200
Do.	do.	Formosa Plastics Group	Yunlin	450
Steel	An Feng Steel Co. Ltd.		Kaohsiung Hsien	2,000
Do.	China Steel Corp.		Kaohsiung	13,000
Do.	Dragon Steel Corp.		Taichung Hsien	900
Do.	Tang Eng Stainless Steel Plant		Kaohsiung	300
Do.	Yieh Hsing Enterprise Co. Ltd.		Kaohsiung Hsien	450
Do.	Yieh Phui Enterprise Co. Ltd.		do.	1,300
Do.	Yieh United Steel Co.		do.	1,000
Do.	Feng Hsin Iron and Steel Co. Ltd.		Taichung Hsien	1,200
Sulfur	China Petrochemical Development Corp.		Taipei	280

^eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto.