

THE MINERAL INDUSTRY OF VIETNAM

By Chin S. Kuo

The 1996 growth of the gross domestic product was around 9.5%. The value of economic output was expected to exceed \$24 billion, bringing per capita income above \$300 for the first time. The annual consumer-price index rose only 3%. The trade deficit for 1996 was widened to \$4 billion against \$2.3 billion in 1995. Exports were led by crude oil, garments, rice, coffee, and marine products. Leading imports included petroleum products, steel, and motorcycles. The dong, the Vietnamese currency, was overvalued by almost 50%, thereby making exports less competitive overseas.

The mineral industry remained relatively undeveloped. Major occurrences of apatite, bauxite, coal, construction materials, natural gas, oil, and rare earths have been identified. Reserves of antimony, chromite, copper, gold, iron ore, lead, tin, titanium, and zinc also have been found. Production of cement, coal, construction materials, natural gas, and oil was most active. Oil and natural gas were most important to the economy of the country. Crude oil pumped from wells offshore Vietnam was the country's top foreign exchange earner.

The country's economic development needed foreign investment. During the period 1996-2000, Vietnam expects foreign investors to supply about 40% of its total investment needs of \$40 billion. In 1996, around \$23 million was invested in exploration projects over 7,800 square kilometers of Vietnam. A further \$260 million was earmarked for 13 development projects. Some 20 foreign mining companies were currently working in the country, one-half of them Australian.

The Government encouraged more foreign investment in Vietnam and national companies to seek foreign partners. During the first half of 1996, the Government licensed 166 projects valued at \$3.07 billion. For 1996, the top three sources of foreign investment were Taiwan, the Republic of Korea, and Singapore.

The National Assembly of Vietnam approved early sections of a new mining law. Foreign companies will be allowed to apply for separate licenses for surveying, exploration, investment, and exploitation. Under the new legislation, original exploration licenses will last 2 years and can be extended by 2 years. Exploitation licenses will last a maximum 30 years, but can be extended another 20 years. The law gives foreign companies that are in possession of an exploration license the right to apply for a mining permit within 6 months of the expiration of their exploration license. The law also will give foreign companies the right to store, transport, consume domestically and export minerals they exploit. The law encourages cooperation of the state-owned exploration companies with foreigners, but foreign investment will be bound

within fields requiring advanced technology and large capital. Local processing to the refined stage also is encouraged. The drafted law covers nonpetroleum minerals such as coal, gemstones, gold, and iron ore. The law became effective on September 1, 1996.

A rag-tag army of prospectors including children was working in very poor conditions in illegal mining camps in the Province of Bac Thai. The Province was the site of a joint venture between Vietnam and Russia in 1994, producing 0.5 kilograms of gold per day. Uncontrolled mining resulted in widespread environmental damage in the country. A number of mines, including the Tra Linh manganese mine and the Ma Nu gold mine in Cao Bang Province, and the tin and wolframite mines in Tuyen Quang, Lam Dong, and Bac Thai Provinces, caused serious environmental problems. A more serious problem was caused by alluvial gold operations that had discharged large amounts of mercury and cyanide into the rivers.

A feasibility study for the construction of a \$400 million aluminum plant in the south central Province of Lam Dong was underway. The smelter/refinery would produce 150,000 to 200,000 metric tons per year (t/yr) of alumina and 75,000 t/yr of aluminum. The facility would be supplied with bauxite from a local mine that was reported to have a reserve of 300 million metric tons (Mt) (Mining Journal, 1996). Funding of the project would come from domestic capital and no target completion date was given.

Tiberon Minerals Ltd. of Canada entered into an agreement with Vietnam Resources Corp. Ltd. to jointly explore the Coi Ky gold-silver-lead-zinc deposit in Bac Thai Province. The deposit covers a stratabound zone of lead-zinc massive sulfides. Tiberon Minerals could earn a minimum of 35% interest in the property by undertaking exploration. In addition, the company would be entitled to the same interest on any project developed within 25 kilometers (km) of the Coi Ky deposit.

Vietnam Steel Corp. (VSC) abandoned a project to build a 250,000-t/yr bar-rod rolling mill in the city of Da Nang, but told its southern subsidiary, Southern Steel Corp. (SSC), to renegotiate the financing and equipment supply deal with Klockner of Germany and Simac of Italy to build a \$50 million, 300,000-t/yr billet plant with possible expansion to 600,000 to 700,000 t/yr. Klockner was investigating financing for the steelmaking project as well as the rolling mill. The four new rolling plants built in 1995 added a total capacity of 700,000 t/yr to the 680,000 t/yr expected to come from SSC and VSC's northern subsidiary, Tisco. Steel demand was expected to increase by 20% to 1.2 Mt in 1996.

Golden Tiger Resources of Australia undertook a joint

venture with Padaeng Industry Co. of Thailand and a Vietnamese company to explore a lead and zinc deposit in the Na Tum area, 150 km north of Hanoi. Golden Tiger Resources also joined a subsidiary of Teck Corp. of Canada in exploring for precious metals in Vietnam. The agreement called for the former to operate up to feasibility study stage and the latter to take over development and marketing phases of the operation.

The country expected \$2.6 billion in foreign investment in the cement industry over the next 5 years to increase production capacity to 20 million metric tons per year (Mt/yr) by the year 2000. Vietnam produced 5.7 Mt of cement in 1996. The country needed 7.9 Mt of cement in the same year. An increased tariff on imported cement slowed 1996 imports to a lower level. Haiphong Cement Co. planned to install a rotary kiln and two separators at its plant in Ching Fong. A 4,200-metric-ton-per-day (t/d) Mulden plate clinker cooler, two mixing chamber silos, and four inspection chamber silos also were included in the project. KHD Humboldt Wedag of Germany signed a deal for a new \$350 million, 4,000-t/d clinker cement plant project in Ninh Binh Province, 100 km south of Hanoi. The plant was expected to be commissioned by 1998. The But Son plant in Nam Ha Province would add 2.8 Mt/yr of potential capacity at a cost of \$196 million and work on the new plant would be completed by 1997.

Holderbank of Switzerland teamed up with the Vietnamese National Cement Corp. under the name of Morning Star Cement to develop two cement projects in the Mekong Delta. The Sao Mai Plant at Kien Giang with a capacity of 1.76 Mt/yr would be completed by 1997. Meanwhile, at Cat Lai, Morning Star Cement was building a mixing and distributing terminal with an expected completion date of late 1996.

Westralian Sands Ltd. of Australia's 60%-owned Austinh Ltd. halted production of ilmenite in Ha Tinh Province. The parent company wanted to restructure its joint-venture agreement with the local government. The Government revoked the investment license for the Austinh joint venture. Austinh produced 16,500 metric tons (t) in 1995 and planned to produce 100,000 t in 1997. Meanwhile, Bimal Minerals Co. Ltd. had been developing the Cat Khanh mineral sands deposit along the coastal area in Phu Cat District of the Binh Dinh Province. Plant construction began in April 1996 and was completed in August, with the first shipment of 4,000 t of ilmenite scheduled to leave the nearby port of Qui Nhon for Japan. The company is a joint venture between Binh Dinh Minerals Co. (40% interest) and two Malaysian companies (combined interest of 60%), Malaysia Mining Corp. and Pendorong.

LG Metal Corp. and LG International Corp., both of the Republic of Korea, agreed in principle with the Government to develop the Dongpao Mine, 450 km northwest of Hanoi, with a total investment of \$11 million. The mine was to produce 4 Mt of cerium, lanthanum, and neodymium ore. The two companies sought to have a combined stake of more than 50% in the project.

The country planned to increase washed coal output to 8 Mt/yr in 1996 and gradually to 10 Mt/yr by the year 2000. Expansion and development were planned for the Khe Tam, Nui Beo, Mao Khe, Cao Son, Yen Tu, Khe Cham, and South Ha Tu

mines, all in the northeast of Vietnam. The local government in Quang Ninh Province ordered the immediate suspension of operations of all coal trading companies operating in the province outside of the National Coal Corp. All coal sales outlets outside of National Coal were closed and only licensed coal companies and operators could market their production through National Coal. National Coal was to increase significantly the inspection rate of coal mines to ensure that they were operating within the law. The Province is Vietnam's largest coal producing region.

Anzoil Asia found a commercially significant natural gas deposit in the Hanoi basin, 90 km southeast of Hanoi. A potential gas reserve of more than 27 billion cubic meters was reported (Far Eastern Economic Review, 1996). The company planned to raise \$24.98 million to finance the appraisal of its gas discovery. The company was examining various options for the gas, including power generation, methanol, urea, and other gas-based industries. Petrofina of Belgium made a discovery of natural gas and oil offshore Vietnam in Block 46, 130 km southwest of Nam Can in the Malay Basin. Petrofina has a 75% interest in Block 46 and Sodec of Japan the remaining 25%. Teikoku Oil Co. of Japan discovered a natural gas field with 700,000 cubic meters per day off southern Vietnam through its subsidiary, Teikoku Oil (Vietnam) Co. The subsidiary participated in an international joint gas and oil exploration project off Vietnam. Conoco Inc. of the United States signed contracts for two blocks in the offshore Tu Chinh area with a better shot at Block 15-01, possibly Vietnam's most promising prospect.

BHP of Australia was considering the closure of the offshore Dai Hung Oilfield because of the revision of production sharing agreement. The \$532 million project began production in October 1993. BHP owns 43.75% of the project; Petronas of Malaysia, 20%; PetroVietnam, 15%; and Total SA of France and Sumitomo Corp. of Japan, 10.62% each. BHP put its stake up for sale and wrote off the \$200 million it had invested in the project to date. In 1996, Shell became the first oil company to abandon exploration operations in Vietnam's Block 10 offshore field. Although 9 of 29 deals signed with foreign oil companies since 1988 ended because they failed to find oil, and new finds had not yet proved commercially viable.

Petronas of Malaysia, in partnership with Conoco Inc. of the United States, acquired a joint 30% interest in Vietnam's first oil refinery project at Dung Quat, Quang Ngai Province. PetroVietnam holds a 30% stake in the \$1.2 billion venture; LG Group of the Republic of Korea, 30%; and Chinese Petroleum Corp. and China Investment & Development Corp., both of Taiwan, joint 10%. The refinery was to have a capacity of 130,000 barrels per day and come on-stream by the end of the decade. The oilfields are located 960 km south of Ho Chi Minh City. The country's demand for petroleum products would grow at 14% to 16% per year until 2010 and a total crude processing capacity of 18 to 20 Mt/yr would be needed. Esso Eastern (70%), a unit of Exxon Corp. of the United States, and Eastern Investment Co. (30%) of Vietnam agreed to a joint venture that would sell petroleum products and build and operate facilities in Nhabe, Ho Chi Minh City.

Daewoo Corp. of the Republic of Korea won a \$370 million contract to build a 91-km highway linking Ho Chi Minh City with the port city of Vung Tao on a build-operate-transfer basis. Daewoo would form a joint venture with a private Vietnamese company and three state-owned entities.

Oxbow International Power Corp. and AES Corp., both of the United States, were negotiating with Vietnam for a \$315 million, 300-megawatt (MW), coal-fired powerplant project in Quang Ninh Province. The plant using low-quality brown coal from the province was structured as a build-operate-transfer project. Electricity of Vietnam would assume full ownership of the powerplant after 20 years. The country's existing generating capacity was 4,480 MW. Demand for electricity grew at 13% per year.

Vietnam borrowed \$55 million from the Swedish Government to construct a 70-MW powerplant at Song Hinh in Phu Yen Province. The hydroelectric powerplant was expected to be operational by 1999. The \$55 million would be disbursed

through the Swedish International Development Authorities and North European financial organizations.

References Cited

- Far Eastern Economic Review, 1996, Anzoil finds gas: June 20, 1996, v. 159, no. 25, p. 69.
Mining Journal, 1996, Vietnamese alumina study: December 13, 1996, v. 327, no. 8408, p. 478.

Major Sources of Information

- Department of Geology and Minerals, Ministry of Industry
Hanoi, Vietnam
Ministry of Energy
Hanoi, Vietnam
Ministry of Power and Coal
Hanoi, Vietnam

TABLE 1
VIETNAM: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1992	1993	1994	1995	1996
Bauxite, gross weight	6,000	6,000	6,500	6,500	6,500
Cement, hydraulic	thousand tons 4,000 r/	4,200 r/	4,700 r/	5,200 r/	5,700
Clays, kaolin	800	800	1,000	1,000	1,000
Coal, anthracite	thousand tons 5,470 3/	6,000	6,100	7,200	7,500
Gold	kilograms 10,000	10,000	10,000	10,000	10,000
Gypsum	30,000	30,000	30,000	30,000	30,000
Nitrogen, N content of ammonia	45,200 3/	51,700 3/	53,000	52,000	53,000
Petroleum, crude	thousand 42-gallon barrels 40,515 3/	44,895 3/	51,100 3/	55,000	58,000
Phosphate rock:					
Gross weight	thousand tons 290 3/	362 3/	470 3/	480	480
P ₂ O ₅ content	do. 93	116	144 3/	145 r/	145
Salt	do. 350	350	375	375	375
Steel, crude	do. 219 3/	270 3/	300 3/	320	320
Tin:					
Mine output, Sn content	3,400	3,500	4,000	4,500	4,500
Metal, smelter	2,400	2,500	2,500	2,800	2,800
Zinc:					
Mine output, Zn content	15,000	15,000	15,000	15,000	15,000
Metal, smelter, primary	10,000	10,000	10,000	10,000	10,000

r/ Revised.

1/ Table includes data available through Apr. 11, 1997.

2/ In addition to the information listed, iron ore was mined in the past and pig iron was produced at industrial facilities, but the status of these industries under prevailing conditions was not sufficiently clear to allow formulation of reliable estimates of output levels. Similarly, data on output of crude construction materials are not available, and no basis is available to make reliable estimates of output level.

3/ Reported figure.