

THE MINERAL INDUSTRY OF VIETNAM

By Chin S. Kuo

For Vietnam, 1995 was a banner year as the country's diplomatic and economic rehabilitation gathered pace. Yet, because of its dramatic rate of economic growth, a gross domestic product (GDP) of 9% was expected for 1995. Industrial contribution to GDP also increased substantially to about 20%. Current account deficit at 8% of GDP was the result of import boom. Inflation ran at 12.7% in 1995. The Government made more efforts to attract foreign capital, while pressing ahead with the economic reform program. Foreign investment rose to \$8.7 billion¹ in 1995.

The mining sector was still relatively small and undeveloped, but the country has a wide variety of exploitable mineral reserves. Continuous geological exploration has discovered many mineral deposits including apatite, bauxite, coal, construction materials, natural gas, oil, and rare earths. Most important are the vast reserves of anthracite currently estimated at 3,000 million metric tons (Mt). Smaller reserves include antimony, chromite, copper, gold, iron ore, lead, tin, titanium, and zinc. Currently, most active minings were coal, construction materials/cement, and oil and gas. (*See table 1.*)

Foreign investment in exploration had focused on placer and primary lode gold deposits in both north and south Vietnam. Offers of significant loans from international donors, most notably Japan, the World Bank, and the Asian Development Bank, helped the country invest in badly needed infrastructure. Considerable direct foreign and local investment was made in the cement, fertilizer, construction, and mining industries.

The introduction of a new mineral policy would replace the 1989 Ordinance on Mineral Resources. The draft mineral law would give increased incentives for investment covering exclusive rights, fixed-term exploration, environmental matters, tax benefits, and exemptions under certain conditions. A new mining law to regulate Vietnam's mineral industry was expected to be enacted by March 1996. The legislation set a framework within which overseas mining companies investing in Vietnam would be guaranteed the right to exploit the resources they found.

New rules had been developed to attract more foreign capital for mining projects. The Government planned to allow foreign companies to own an increased stake in mineral properties, including the possibility of 100% ownership. Under the new investment outlines, a Vietnamese firm that had completed a project's exploration and development could

form a joint venture with foreign companies to complete the mining phase. However, if neither the initial exploration and development nor the mining had begun, a foreign company could own a 100% interest in the project.

Vietnam's movement toward a free market, capitalist economy had resulted in an increase in trade with nations in the world, including the United States. The first shipment of Vietnamese low-sulfur anthracite coal was received in January at Burnside, Louisiana. On regional trade, Vietnam was to reduce its tariffs on selected products to 5% by 2003.

The Government geologists discovered seven antimony deposits with estimated reserves of 30,000 metric tons (t)² at Duong Huy-Cam Pha in Quang Ninh Province.

Mitsubishi Corp. of Japan and Gencor Ltd. of South Africa joined Krupp Fordertechnik of Germany and Lonrho Pacific of the United Kingdom to carry out the feasibility study on the Thach Khe iron ore project, 8 kilometers (km) northeast of Ha Tinh City and 300 km south of Hanoi. The estimated reserves of the iron ore deposit was about 520 Mt,³ and total capital investment could reach \$700 million to \$1 billion. Ore grade was estimated at about 58% to 59% iron content. Production capacity of 10 million metric tons per year (Mt/yr) was foreseen in a pre-feasibility study, and open pit mining was planned. Iron ore would be exported to China and other Asian nations. Meanwhile, Austroplant of Austria and Vietnam Steel Corp. completed a feasibility study for a \$1.28 billion steel plant that would produce 1.4 Mt/yr of steel. Initially, iron ore would be imported, and, later, the Thach Khe iron ore mine would supply the feedstock.

Vietnam Steel Corp., NKK, and Mitsubishi of Japan planned to develop a \$80-million, 500,000-metric-ton-per-year (t/yr) steel billet project at Cai Lan in northern Vietnam. Production was to start in 1999 with an initial rate of 300,000 t/yr of billets. Because of a shortage of local scrap, a lack of port facilities, and the funding of the port, the project had been on hold. A fourth investor to join the project was being sought.

Vietnam Steel and Pohang Iron and Steel Co. Ltd. of the Republic of Korea opened a \$56-million, 200,000-t/yr plant in Haiphong producing reinforcing bar and wire rod from imported billets. And the Vina Kyoei Steel joint venture had been involved in a feasibility study to build a 400,000-t/yr plant, possibly near Da Nang.

Vietnam Steel and Daewoo Corp. of the Republic of Korea planned to form a joint venture to build a 1 Mt/yr steel works

at Vung Tau or Da Nang. Total investment was estimated at \$640 to \$740 million. Construction was to begin by the end of 1996 with commissioning by the year 2000. Early in 1995, Daewoo linked up with Pusan Steel Pipe and a Vietnamese company called Waseco to build a 70,000-t/yr electric resistance welded pipe mill near Ho Chi Minh City.

Vietnam Steel, Nissho Iwai of Japan, and SMPC Metal Industries of Malaysia formed a joint venture, Vinanic Steel Processing, to construct and manage a 2,000-t/yr, cold-rolled sheet processing plant at Haiphong. Commission of the plant was scheduled for fall 1996. Vinanic would be owned 50% by Vietnam Steel, 30% by Nissho Iwai, and the balance by SMPC.

Three Vietnamese companies, Southern Steel, An Phu Production Services Co., and Thep Viet, formed a joint venture with Ho Asian of Taiwan to build a steel mill at Can Tho, 100 km southwest of Ho Chi Minh City. With an investment of \$12.1 million, the venture planned to produce 120,000 t/yr of rebar and wire rod. Four joint-venture long product plants were licensed to come on-stream in 1995, with a potential additional 740,000 t/yr of steel rod and bar.

BHP Steel Building Products of Australia planned to build a second plant in Ha Tay Province to supply roofing and cladding sheets. The plant was to cost \$7 million and should be operational in May 1996. The plant with a production capacity of 6,000 t/yr would receive raw materials supplied from BHP's plants in Australia.

Leader Resources of Australia focused on a base metals exploration project in Bac Thai Province. The exploration license covers an area of 105 square kilometers (km²) that hosts three known mineralized targets, including the Na Tum Hill zinc/lead/silver deposit. A resource of up to 12 Mt⁴ grading 15% combined zinc and lead was being tested. A lack of foreign capital had slowed the exploitation of reserves containing zinc metal. Meanwhile, Padaeng Industries of Thailand applied for a license to mine and process at a property adjacent to Na Tum Hill. A joint venture between Leader Resources and Teck Exploration of Canada applied for two gold exploration licenses for the 164-km² Kim Hoa prospect and the 190-km² Khau Au prospect in central and northern Vietnam, respectively.

Vietnam Rare and Precious Minerals Corp., Hindustan Zinc Ltd. of India, and Bureau de Recherches Geologiques et Minieres of France were to set up a joint venture to explore and develop gold deposits at Pac Lang. India also would help in the construction of an aluminum smelter in Vietnam to utilize the bauxite reserves in the two countries, and the Geological Survey of India would help in different phases of exploration, mining, and processing of the mineral resources in Vietnam.

A group of 10 Malaysian tin companies began talks with Vietnam Rare and Precious Minerals Corp. on the possibility of mining tin in central Vietnam. Talks were suspended pending the introduction of revised Vietnamese mining laws.

A shortage of cement in the country caused prices to

double and created a chaotic black market. Demand for cement was expected to reach 9.0 Mt in 1995, but the existing cement plants could produce 7.5 Mt/yr despite an estimated increase of 2 Mt/yr. Imports of cement were expected to rise.

Five cement plants financed by foreign companies were either planned or under construction. A joint venture between Vietnam Cement General Corp. and Nihon Cement-Mitsubishi of Japan was established to build the Nghi Son cement plant at Tinh Gia, Thanh Hoa Province, at a cost of \$347 million. Production capacity was planned for 2.3 Mt/yr. The plant was scheduled to come on-stream in 1996. Lucky Cement Group of Taiwan formed a joint venture with Hai Hung Province and Vietnam Commerce and Industry Bank to construct the \$265 million Phuc Son cement plant with a production capacity of 1.8 Mt/yr. Chichibu-Onoda Cement and Zip Commercial Corp., both of Japan, signed a contract with Ha Tay Construction Service to build a cement plant at My Duc, Ha Tay Province. The plant was to have a capacity of 1.2 Mt/yr. Vietnam Union of Cement Plants planned to expand its Hoang Thach plant with a 3,300-metric-ton-per-day (t/d) production line that was scheduled on line in late 1995. Financing for a new 4,000-t/d cement plant at Butson was finalized in early 1995, and the plant was expected to be on-stream by the end of 1997. Technip-CLE of France was the principal contractor for the plant, and the project was underwritten by loans from two French banks. Marubeni of Japan would provide credits to cover interest payments and fees during construction. Vietnam planned an investment of \$195 million in the plant.

The Government signed an agreement with five foreign companies to conduct a feasibility study to build a fertilizer complex and integrated powerplant at Phu My, southern Vietnam. They were BHP of Australia, British Petroleum, Statoil of Norway, Tomem Corp. of Japan, and Tractebel of Belgium. The \$800 million project was to construct a 350,000-t/yr ammonia plant, a 600,000-t/yr urea plant, and a 600-megawatt (MW) powerplant. The complex would be linked with the offshore Nam Con Son Gasfield by a 370-km natural gas and oil pipeline. In another development, Nissho Iwai and Central Glass Co., both of Japan, established a \$35-million joint venture with a Vietnamese partner to produce 240,000 t/yr of fertilizer at Long Trinh, Dong Nai Province. The plant was due to come on-stream in 1998. The country imported 2 Mt of fertilizer in 1995, of which urea accounted for 1.3 Mt.

State-owned Fertilizer and Basic Chemicals Corp. (Ferchemco) was to form a joint venture with All Ocean International of the United States to build a 150,000-t/yr diammonium phosphate (DAP) plant in Quang Minh Province. The \$100-million project would be funded at 40% by the former and 60% by the latter and would come on-stream in 1997-98. Phosphate rock would come from local deposits. Plans for a second 250,000-t/yr DAP plant were being considered. Ferchemco also was conducting

preliminary studies to build a new 560,000-t/yr ammonium-urea plant near Ho Chi Minh City.

Westralian Sands Ltd. of Australia was to restart ilmenite production, limited to 60% of capacity, or 40,000 t/yr, at its Austinh joint venture with Ha Tinh Provincial government. However, the mine expansion plans to invest \$4.5 million funded by the Australia and New Zealand Banking Group in upgrading facilities to increase production capacity to 80,000 t/yr in 1995 and 100,000 t/yr by 1997 had to be postponed. Currently, an ilmenite export limit of 50,000 t/yr from this mine had been imposed. Westralian Sands has a 60% interest in the \$3.2-million joint venture; the Provincial government, 30%; and the Ministry of Heavy Industry, 10%. Meanwhile, Malaysia Mining Corp. (60%), in partnership with state-run Binh Dinh Mineral Co. (40%), invested \$1.79 million to develop the Catkhanh Mine in Quinhon in October for ilmenite production. The mine was believed to have reserves of zircon, monazite, and titanium ore. When fully developed, the mine was expected to produce 40,000 to 60,000 t/yr of ilmenite for export to neighboring countries.

The Government planned to increase coal production to 10 Mt/yr to supply export markets. Vietnam Coal Corp. (Vinacoal) alone produced 8.4 Mt of coal in 1995 from the Quang Ninh coal base. Vinacoal intended to increase coal production for powerplants, but was facing a severe capital shortage. Coal exports from Vietnam, mainly anthracite, had increased by an average of 35% per year for the last 5 years and accounted for 35% to 40% of production. In 1995, Vietnam exported 2.7 Mt of coal. Coal & Allied of Australia was among the companies that were interested in importing coal to Australia.

Australian Coal Industry Research Laboratories Ltd. won an international tender to construct a coal quality laboratory for Campha Coal Co. The Australian research organization had been involved in a number of projects associated with the export of anthracite and in resource development.

BHP of Australia planned to invest \$766 million to develop massive gas supply, power generation, and fertilizer plant in Vietnam. A new pipeline would link several gasfields such as Lan Tay and Lan Do in block 6 to the mainland. The block 6 was reported to contain gas reserves of up to 141.5 billion m³.⁵ The gasfield development plan and pipeline project would fit with the production development of the nearby Dai Hung Oilfield. The natural gas was to be used as a feedstock for a proposed powerplant and fertilizer plant producing urea.

The Dai Hung Field operated by BHP produced lower than

expected crude oil in 1995, but the country's output was still planned for 7.7 Mt at 155,000 barrels per day (bbl/d). The field produced 25,000 to 30,000 bbl/d in 1994 and only 15,000 bbl/d in October. Most of the oil would come from the Bach Ho Field and the Rong Field off the coast of southern Vietnam, operated by the VietSovPetro joint venture with Russia.

Mitsubishi Oil Co. of Japan discovered oil in the Phuong Dong Field off the southern coast of Vietnam, near the Rang Dong Field, which was found in 1994. Mitsubishi Oil's joint-venture company with Vietnam National Petroleum Corp. had been exploring for oil in the block. The two partners would assess these two oil finds for possible commercial production.

PetroVietnam, the state-owned oil company, began talks with a group of investors to build the country's first oil refinery in Quang Ngai Province. The \$1.2 billion project involved PetroVietnam (30%), a group led by PETRONAS of Malaysia (30%), and a group led by LG Group of the Republic of Korea (30%). PetroVietnam and Edcon Inc. of the United States began surveying about 200,000 line km of aeromagnetic data offshore southern Vietnam over a 450,000 km² area. Atlantic Reconnaissance of the United Kingdom was to collect the data. The survey was the largest single geophysical project conducted offshore Vietnam to date.

A group led by ABB, the European power company, and Marubeni Corp. of Japan won a contract worth \$100 million from state-owned Electricity of Vietnam to build the 287-MW Phu My 2 powerplant, southeast of Ho Chi Minh City. Construction of the plant was to begin in February 1996, and completion was scheduled for March 1997.

¹Where necessary, values have been converted from Vietnamese dong (D) to U.S. dollars at the rate of D11,000=US\$1.00 for 1995.

²Mining Journal, Sept. 8, 1995, p. 172.

³The Tex Report, Nov. 13, 1995, p. 3.

⁴Mining Magazine, Apr. 1995, p. 262.

⁵State Dept. Telegram, Apr. 10, 1995, p. 1.

Major Sources of Information

Geological Survey of Vietnam

Hanoi, Vietnam

Ministry of Energy

Hanoi, Vietnam

Ministry of Power and Coal

Hanoi, Vietnam

TABLE 1
VIETNAM: PRODUCTION OF MINERAL COMMODITIES e/ 1/

(Metric tons unless otherwise specified)

Commodity 2/	1991	1992	1993	1994	1995	
Bauxite, gross weight	6,000	6,000	6,000	6,500	6,500	
Cement, hydraulic	thousand tons	3,000	5,000	6,500	7,200	7,500
Clays, kaolin	800	800	800	1,000	1,000	
Coal, anthracite 3/	thousand tons	5,000	5,470	6,000	6,100	7,200
Gold	kilograms	1,300	10,000	10,000	10,000	10,000
Gypsum	30,000	30,000	30,000	30,000	30,000	
Nitrogen, N content of ammonia	30,000	45,200	51,700 3/	53,000	52,000	
Petroleum, crude 3/	thousand 42-gallon barrels	29,200	40,515	44,895	51,100	55,000
Phosphate rock:						
Gross weight 3/	thousand tons	275	290	362	470	480
P ₂ O ₅ content	do.	88	93	116	144 3/	147
Salt	do.	350	350	350	375	375
Steel, crude 3/	do.	183	219	270	300	320
Tin:						
Mine output, Sn content	800	3,400	3,500	4,000	4,500	
Metal, smelter	1,700	2,400	2,500	2,500	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	

e/ Estimated.

1/ Table includes data available through May 20, 1996.

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.