

THE MINERAL INDUSTRY OF TRINIDAD AND TOBAGO

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Trinidad and Tobago's gross domestic product (GDP) increased 3.6% in 1998 with the largest increases in the construction and distribution sectors (Central Bank of Trinidad and Tobago, 1999, p. 3). The petroleum sector outpaced the general growth of the economy with an increase of 5% despite lower prices and even though production of crude petroleum decreased. The reason for much of the increase of the sector was attributed to the performance of the petrochemical subsector, which increased by 22%. Agriculture was the only sector of the economy that decreased.

The petroleum sector continued to dominate Trinidad and Tobago's economy, representing 21% of GDP (Central Bank of Trinidad and Tobago, 1999, p. 43), 19% of Government revenue, (Central Bank of Trinidad and Tobago, 1999, p. 54), and 44% of total exports (Central Bank of Trinidad and Tobago, 1999, p. 72). However, production of crude petroleum continued to decline while production of natural gas and its impact on the general economy continued to increase. Owing to Trinidad and Tobago's abundance of natural gas reserves, the country has become an important producer and in 1998 retained its position as the second leading world exporter of ammonia, after Russia. Proven reserves of natural gas reached 18.3 billion cubic feet (518.4 million cubic meters) at yearend 1998 (Central Bank of Trinidad and Tobago, 1999, p. 6). In addition to an expanding ammonia production capacity, which uses natural gas for energy and feed material, Trinidad and Tobago's other petrochemical industries and the iron and steel sector have benefited from the availability of inexpensive natural gas.

Other mineral commodities produced in Trinidad and Tobago were asphalt, cement, direct-reduced iron (DRI), limestone, natural gas liquids, and sulfur. (See table 1.) A large portion of the production of these commodities was for export. In 1998, 99% of the production of natural gas liquids, 96% of the production of wire rod, 92% of the production of petroleum refinery products, 90% of the production of fertilizers, 74% of the production of asphalt, and 46% of the production of cement was exported. The United States was Trinidad and Tobago's main trading partner, receiving 36.9% of Trinidad and Tobago's total exports and providing 44.7% of its total imports. Actual and planned U.S. investment in Trinidad and Tobago between 1996 and 1999 was estimated to be \$4 billion (U.S. Embassy, Port of Spain, Trinidad and Tobago, 1998). Most of the U.S. investment was in the petrochemical and the petroleum sector.

Production of mineral commodities in Trinidad and Tobago was by the Government and the private sector.

Production of cement by Trinidad and Tobago's sole

producer, Trinidad Cement Ltd., increased by 5.8% to 690,400 metric tons (t) and domestic sales increased by 8.1% to 366,200 t, reflecting the increase of the construction sector, in part because of the expansion of the natural gas based industry.

Steel was produced by an integrated minimill owned by Caribbean Ispat Limited (CIL), a subsidiary of Ispat International N.V. At yearend 1998, CIL had a capacity to produce 2.6 million metric tons (Mt) of DRI because of the construction of a new DRI Midrex plant, which expanded CIL's capacity by 1.4 Mt (Ispat International N.V., August 16, 1999, accessed August 20, 1999, at URL <http://www.ispat.com/subsidiaries/ispatcaribbean.htm>). According to the Central Bank of Trinidad and Tobago, production was 1 Mt, which was less than 40% of capacity, and a 9.7% decrease from the production achieved in 1997 because of disrupted production during the third and fourth quarters of 1998. Exports, only about 20% of production, also decreased by almost 40%, mainly because of economic conditions in Asia and Russia. Consumption of DRI by CIL increased slightly to 798,300 t. Production of crude steel and billets increased by 6.1% and by 3.9%, respectively.

Production of petroleum in Trinidad and Tobago was by the Government-owned Petroleum Company of Trinidad and Tobago Ltd. (Petrotrin) and by the private sector represented by Amoco Energy Company of Trinidad and Tobago, Trinmar Ltd., a joint venture between Petrotrin and Texaco Trinidad Inc., and Trinidad and Tobago Marine Petroleum Company (Trintomar), a joint venture with the National Gas Co. (See table 2.) About 44% of total crude petroleum was produced by Amoco Energy, followed by Trinmar with 25% and Petrotrin with 23% (Petroleum Company of Trinidad and Tobago Ltd., [undated], the Petroleum Economist interviews chairman Donald Baldeosingh, accessed August 20, 1999, at URL <http://www.petrotrin.com/petrotrin/petroleumeconomist.htm>). Exploration for natural gas in Trinidad and Tobago was led by Amoco Energy, but there were other international private companies, such as Enron Oil & Gas Co., Société Nationale Elf Equitaine, Repsol SA, Broken Hill Pty. Ltd., British Gas, and Texaco Inc., that had significant exploration activities, mostly offshore. However, in 1995 the Southern Basin Consortium was formed to explore the onshore Caroni basin by Petrotrin, Anderman-Smith, the Royal Dutch/Shell Group, and Krishna Persad & Associates (Oil & Gas Journal, 1997). In 1997, the Government opened bids for nine offshore blocks (World Oil, 1997).

In 1998, production of crude petroleum fell by less than 1%. Production of refinery products, however, climbed by 46%. This greater refinery output resulted from the upgrade of

Petrotrin's only operating refinery in Pointe a Pierre, completed in 1998. The \$350 million capacity upgrade, which was funded by the Inter-American Development Bank, the Japan Export-Import Bank, the European Investment Bank, the Caribbean Development Corporation, and Petrotrin, increased production capacity from 100,000 barrels per day (bbld) to 160,000 bbl. This upgrade included the revamping and recommissioning of a catalytic unit, a hydroheating unit, and a fluid catalytic cracking unit, as well as the addition of a hydrogen plant, sulfur recovery and handling facilities with a capacity of 183 metric tons per day of sulfur, and a methyl tertiary-butyl ether unit.

Environmental recovery was part of the upgrade (Petroleum Company of Trinidad and Tobago Ltd., [undated], Refinery upgrade, accessed August 20, 1999, at <http://petrotrin.com/petrotrin-new/D-business/upgrade.htm>). This and other efforts were aimed to improve the efficiency and competitiveness of the refinery. In 1997, Petrotrin signed a technical services agreement with the Indian Oil Co. to improve its refinery operations. The Government, interested in further expansion of the refinery, was considering a partnership with an international company without selling any part of the company (Petroleum Economist, 1998).

Other international companies were investing or were considering future investment in Trinidad and Tobago because of its natural gas resources. At yearend 1998, Norsk Hydro AS of Norway signed a preliminary agreement with the Government of Trinidad and Tobago for a \$2.5 billion 474,000-ton aluminum smelter, including a dedicated powerplant (Sköld, 1998). The company also secured a long-term contract with National Gas Company to supply the natural gas needs for the smelter.

Plans for the expansion of the \$1 billion Atlantic LNG 3-Mt liquefied natural gas project, scheduled for completion in 1999, were announced (James, 1999). The expansion would increase the production capacity to 9 Mt and would require an additional investment of \$1.5 billion.

The natural gas liquids extraction company Phoenix Park Gas Processor Limited began an expansion program that would double the company's production capacity to 1,350 cubic feet per day (Petroleum Economist, 1997). The \$170 million project was scheduled for completion in 1999 (Central Bank of Trinidad and Tobago, 1999, p. 7).

A 225-megawatt powerplant was under construction in

Trinidad in 1998 (York Research Corporation, September 11, 1998, York Research contracts for Operation and Maintenance of power plant in Trinidad, press release, accessed September 11, 1998, at URL http://biz.yahoo.com/bw/980911/york_resea_1.html). The plant, owned by InnGOGEN Limited, an indirect wholly owned subsidiary of U.S. company York Research Corporation, was scheduled to begin commercial operation in September 1999. Most of the production from the plant would be sold to the Trinidad and Tobago Electricity Commission under a 30-year power purchase contract.

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Major Sources of Information

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TABLE 1
TRINIDAD AND TOBAGO: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997	1998
Asphalt, natural	21,000 2/	20,000 2/	18,100 2/	15,396 r/ 3/	18,735 3/
Cement, hydraulic 2/	582,900	558,500	617,100	652,500	690,400
Gas, natural 2/					
Gross	7,690	7,996	7,127	9,137 r/	10,294
Marketed	5,943	6,119	7,049	7,379 r/	8,651
Iron and steel:					
Direct-reduced iron 2/	946,600	1,039,900	954,500	1,133,800	1,023,100
Steel, crude	631,000	738,000	695,000	736,000	781,425
Semimanufactures (billets) 2/	630,200	676,100	643,600 r/	747,000 r/	776,900
Lead, refined (secondary) e/	1,600	1,600	1,600	1,600	1,600
Natural gas liquids	3,485 2/	3,747 2/	4,460 2/	4,113 3/	5,254 3/
Nitrogen, N content of ammonia 4/	1,649	1,696	1,801	1,772	2,271
Petroleum:					
Crude	48,009 2/	48,111 2/	47,171 2/	45,166 r/ 3/	44,759 3/
Refinery products	36,227 2/	34,391 2/	41,067 2/	33,525 r/ 3/	49,019 3/
Stone, limestone e/	1,600	1,600	1,600	1,219 r/	1,100
Sulfur, byproduct of petroleum e/ 5/	5,000 r/	5,000 r/	5,000 r/	15,000 r/	15,000

e/ Estimated. r/ Revised.

1/ Table includes data available through August 11, 1999.

2/ Source: Central Bank of Trinidad and Tobago Annual Economic Survey.

3/ Source: Ministry of Energy and Energy Industries.

4/ Source: International Fertilizer Industry Association.

5/ Sulfur as a byproduct of natural gas may be produced, but information is inadequate for reliable output estimates.

TABLE 2
TRINIDAD AND TOBAGO: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders	Location of main facilities	Annual capacity
Anhydrous ammonia	Trinidad Nitrogen Co. Ltd. (Norsk Hydro AS, 49%; Government, 51%): Tringen I Tringen II	Point Lisas, Caroni Co. do.	460. 454.
Do.	PCS Nitrogen Trinidad Limited (Potash Corp. of Saskatchewan (PCS))	do. (four plants)	2,023.
Do.	Farmland MissChem Limited (Farmland Industries Inc., 50%; and Mississippi Chemical Corp., 50%)	La Brea, St Patrick Co.	620.
Do.	Federation Chemicals (Norsk Hydro AS, 100%)	do.	300.
Asphalt	Lake Asphalt of Trinidad and Tobago Ltd. (1978) (Government, 100%)	Brighton, St. Patrick Co.	60.
Cement	Trinidad Cement Ltd. (Cemex of Mexico, 20%; Government, 80%)	Claxton Bay, Caroni Co.	700.
Iron and steel	Iron and Steel Co. of Trinidad and Tobago (Caribbean Ispat Limited)	Point Lisas, Caroni Co.	2,600 DRI, 1,000 steel, 700 billets and wire rod.
Do.	Nucor Iron Carbide Inc. (Nucor, U.S., 80%; Samitri, Brazil, 20%)	do.	320 iron carbide.
Petroleum:			
Crude	Amoco Energy Company of Trinidad and Tobago (Amoco International Oil Co. Ltd., 100%)	Banyan, Cassia, Flambouyant, Immortelle, Poui, Samaan, and Teak	60,000. 1/
Do.	Petroleum Company of Trinidad and Tobago Ltd. (Petrotrin) (Government, 100%)	Various	30,000. 1/
Do.	Trinmar Ltd. (Texaco Trinidad Inc, 33 1/3%; Petrotrin, 66 2/3%)	Soldado fields, offshore in Gulf of Paria	40,000. 1/
Products	Petrotrin (Government, 100%)	Point Fortin, St. Patrick Co.	145,000. 1/ 2/
Do.	do.	Point-a-Pierre, Victoria Co.	160,000. 1/
Sulfur	do.	do.	67.

1/ 42-gallon barrels per day.

2/ Closed in 1993.