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## TRINIDAD AND TOBAGO

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Trinidad and Tobago comprises 23 of the southernmost Caribbean islands, with Trinidad the largest at 4,828 km<sup>2</sup>, followed by Tobago at 300 km<sup>2</sup>. Trinidad itself lies just 11 km off the Venezuelan coast north of, and opposite, the mouth of the Orinoco River, and is separated from the South American coast by the Gulf of Paria. Being the Caribbean's largest producer of oil and gas has enabled Trinidad and Tobago to become the most industrialised Caribbean nation. In fact, the country's oil revenues account for about a quarter of GDP, although crude oil reserves, at an estimated 686 million barrels, are expected to last only another decade. The government has encouraged new exploration based on estimates that deep-water blocks off the east coast of Trinidad could contain up to 1 billion barrels of oil, but there is also a major effort to discover more oil onshore. Between the summer of 2000 and 2003, 16 exploration wells were drilled. Last year, 105 development wells were drilled, a 22% increase over 2000. Trinidad and Tobago is mapping its last major open offshore acreage in the 'ultra-deep' region off the east coast, with plans to offer blocks for competitive bidding after completion of a seismic survey.

Oil exploration, which tends to focus on marine exploration drilling; is being undertaken by FP, EOG Resources, BHP Billiton, Exxon, British Gas, Conoco and Trinidad Shell Exploration and Production Ltd. BHP Billiton declared commercial discoveries in the Kairi 1 and the Canteen 1 wells in Block 2c. Results from Canteen 1 confirm a significant oil find, the fourth BHP Billiton discovery in the area, and the company hopes to fast track the development which could be in production within two to three years, given the relatively shallow water and proximity to the coast. BHP Billiton holds a 45% interest in Block 2c, and the other partners include TotalFinaElf (30%) and Talisman Energy (25%). BP also plans to invest more than US\$2.7 billion over the next five years. Its Trinidad and Tobago unit is BPTT and during the past five years more than US\$2,200 million have been invested.

Land operations have involved Petrotrin, Lease and Farmout Operatorship, Primera Oil and Gas Ltd, Trinidad Exploration and Development Ltd, Tracmac Moruga Energy Resources Ltd, New Horizons Exploration Trinidad and Tobago Ltd, and Vintage Petroleum. Total oil production from the land averaged 25,142 bbl/d, about a 6% decrease from 2000. Petrotrin contributed 78% of total production.

Although oil production is slowly declining, Trinidad and Tobago has emerged as one of the major natural gas development centres in the world, which in turn has helped support eight ammonia complexes, five methanol units, a urea plant, and an iron and steel facility. Consequently, Trinidad is the world's leading exporter of ammonia and potentially the leading exporter of methanol.

Over the past decade domestic natural gas demand has doubled, owing mainly to new construction and expansions of methanol, ammonia and iron reduction plants, and is projected to double again by 2005. The Atlantic plant is reputed to be the largest single-train plant ever constructed and the first LNG producer in the region. It was built in a record 6.5 years and Atlantic intends to triple capacity. In January 2000, the government approved the construction of two additional gas trains, which will make the complex the fourth-largest in the world.

Over 1.3 Mt/y of methanol are exported, with triple that amount of ammonia. The Titan Methanol plant came fully on stream in 2002. New ventures should lift fertiliser capacity to 4.5 Mt/y. Companies investing in fertiliser and methanol have included Norsk Hydro of Norway, Ferrostaal and Helm of Germany, Methanex of Canada, and Farmland and Mississippi Chemical of the US. Canada has been a major investor and Potash Corp of Saskatchewan, which acquired Arcadian, now PCS Nitrogen, has three ammonia plants and a fourth under construction at the Point Lisas Industrial Estate petrochemical complex.

Lake Asphalt of Trinidad and Tobago (1978) Ltd, a wholly-owned state company, exploits natural asphalt from the famous Pitch Lake in La Brea, Trinidad. The asphalt occurs as a semi-solid emulsion composed of soluble bitumen (53-55%), mineral matter (36-37%), and other minor constituents including water (9-10%). The raw material is refined through polymerisation, selective absorption by clay minerals and silica, electrostatic accumulation of pitch bodies, and geothermal oxidation of a parent crude to remove water and other minor constituents and so produce Epure. This is used as a modifier to road-grade bitumen for use in pavement construction on roads, bridges, tunnels and seaport terminals.

The country's major non-oil exports are iron and steel. Point Lisas is expanding in response to industrial growth and hosts the Nucor iron carbide plant and the direct reduction-based steel-maker Ispat. Norsk Hydro, whose Agri division has been in Trinidad since 1991, employs 320 employees, mainly in ammonia production, and has planned to build another aluminium smelter near its existing ammonia plant; the US\$1,500 million plant should begin production this year and the project is part of the division's strategy to double production capacity of primary aluminium from 1995 to 2005. The available production capacity would be 237,000 t/y with an equal increase in a second step production later.

Geologically, Trinidad is located at the triple junction formed by the meeting of three geological plates, making it one of the most geologically complex areas of the world. There are about 50 active quarries and the demand for construction aggregates has increased dramatically. An important outlet for limestone is Trinidad Cement Ltd's (TCL) 600,000 t/y cement plant on the western coast of Trinidad near Point Lisas. TCL is part of the Trinidad Cement Ltd group of companies, the Caribbean's foremost producer and supplier of cement and gypsum, with a production capacity of 1.7 Mt/y. The

group consists of three cement-producing plants – Arawak Cement Co Ltd (ACCL) in Barbados, Caribbean Cement Co Ltd (CCCL) in Jamaica, as well as Trinidad Cement Ltd, in Trinidad. The group's subsidiaries and share ownership include TCL Packaging Ltd (80%), Arawack Cement Co Ltd (100%), TCL Ponsa Manufacturing Ltd (65%), Readymix (WI) Ltd (70%), TCL Trading Ltd (100%) and Caribbean Cement Co Ltd (74%).

TCL was incorporated in Trinidad in 1951 and started production in 1954 producing ordinary Portland Cement as well as Class G high sulphate-resistant (HSR) oil-well cement. Initially, the company was 100% government owned until it was effectively privatised in 1990. TCL owns approximately 120 ha of limestone reserves which, based on current annual extraction rates, are confirmed to last more than 100 years. The other raw material used is gypsum, which accounts for the remaining 5% content and is readily available. The Trinidad operation has two kilns and the wet process is used exclusively at the Claxton Bay plant. ACCL has one kiln that uses the dry process and has a production capacity of 315,000 t, whereas CCCL has two kilns and uses a combination of both wet and dry processes. The cost of production at TCL Trinidad is the lowest among the three plants, with costs at ACCL and CCCL being 25% and 35% higher respectively, largely because of higher energy costs in Barbados and Jamaica.

Blue-coloured limestone and sand and gravel of various grades are quarried in the Northern Range for use in construction, and plastering or red sand is quarried in central Trinidad and used as a low-grade filler material and as a construction finishing material. Yellow-coloured limestone is also quarried in the south central portion of Trinidad, and clay from the central and south-eastern area is used for blocks, tiles and pottery. Other economic minerals include andesite, argillite, porcellanite, fluorspar, graphite, gypsum, sand and gravel, quartz gravel and sandstone.