

## THE MINERAL INDUSTRY OF

# BRUNEI

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Brunei, which is a small country with rich oil and gas resources on the northwestern coast of Borneo Island in Southeast Asia, was among those nations with the highest per capita income in the world. Its national wealth was derived primarily from exports of its hydrocarbons in the form of liquefied natural gas (LNG), crude petroleum, and refined petroleum products. The country's proven reserves of crude petroleum and natural gas, which were located mostly offshore, were estimated to be 1.35 billion barrels and 390.77 billion cubic meters, respectively (Oil & Gas Journal, 2000b). Brunei also had considerable resources of carbonate rocks, coal, kaolin, sand and gravel, and silica sand (Quazi, 1996, p. 1-7). In 2000, Brunei ranked seventh in production of crude petroleum and eighth in production of natural gas in the Asia and Pacific region (Oil & Gas Journal, 2000b). In 2000, cement (using imported clinker), construction aggregate, and sand and gravel were produced for consumption by the construction industry. Virtually all requirements for ferrous and nonferrous metals and most of the industrial mineral products other than cement, construction aggregate, and sand and gravel were met by imports.

The oil and gas industry, which dominated the mineral industry, played a major role in Brunei's economy. The industry generated between 75% and 90% of Government revenues, contributed more than 50% of the country's gross domestic product, and earned between 80% and 90% of the country's exports (U.S. Energy Information Administration, November 2000, Brunei—General background, Country Analysis Brief, accessed December 6, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/brunei2.html>). In 2000, Brunei's economy was estimated to have grown by 3.0% compared with 2.5% in 1999 owing mainly to increased output of crude petroleum and higher prices for oil (Far East Economic Review, 2001).

To reduce economic over reliance on the oil and gas industry, the Government of Brunei reportedly had commissioned a consortium, which consisted of Dover Consultants and Woodhill Thornton of Australia and Syed Muhammad Dan Hooi of Brunei, to conduct a study on the potential for developing a refining and petrochemical industry despite its small domestic market, high labor costs, and the lack of infrastructure. Phase I of the study was a market and economic analysis for the potential core activities—petrochemical and refining that will directly use electricity and natural gas. Phase II of the study would consider optimum plant size, location, infrastructure requirements, socioeconomic benefits, financing options, strategic alliance, and joint ventures for the development (Asian Chemical News, 2000).

The oil and gas industry consisted of Brunei Shell Companies, Elf Petroleum Asia (EPA), and Fletcher Challenge

Energy. EPA is a subsidiary of TOTAL Fina Elf S.A. (formerly Elf Aquitaine). Brunei Shell Companies conducted oil and gas exploration, produced and refined crude petroleum, produced and processed natural gas, marketed crude petroleum, refined petroleum products, and processed natural gas products. EPA conducted oil and gas exploration, produced natural gas and natural gas liquid. Fletcher Challenge Energy only conducted oil and gas exploration. The mining and quarrying industry consisted of more than 20 privately owned companies that engaged mainly in production and marketing of construction aggregates and sand and gravel. Additionally, a cement company operated a clinker grinding plant for cement production and marketing. The mineral industry's employment was estimated to be about 4,300, about 85% of which were employed by the oil and gas industry (International Monetary Fund, 1999).

In 2000, crude petroleum output averaged 191,000 barrels per day (bbl/d), and natural gas output averaged 33.7 million cubic meters per day. About 92% of crude petroleum production and most of natural gas production, in the form of LNG, were exported (U.S. Energy Information Administration, November 2000, Brunei—Oil and natural gas, Country Analysis Brief, accessed December 6, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/brunei2.html>). The increased output of crude petroleum and natural gas in 2000 was attributed to higher energy prices and the incremental output from new offshore Maharaja Lela Gasfield, which was brought on-stream by EPA in 1999. Development was completed at a cost of \$250 million (International Petroleum Encyclopedia, 2000).

In February 1999, EPA started production in the Maharaja Lela Gasfield at the rate of 2.97 million cubic meters per day of natural gas and 2,000 bbl/d of natural gas liquids (World Oil, 1999). By 2000, EPA had installed two platforms and a 85.3-kilometer, 55.9-centimeter pipeline and drilled five development wells. Commingled liquid production from wells was delivered through the pipeline to the company's onshore processing plant to remove CO<sub>2</sub> and then delivered to the Lamut LNG plant, which was operated by Brunei LNG Sdn. Bhd. (World Oil, 2000).

Brunei Shell Petroleum Co. Sdn. Bhd. (BSP), which was the major producer, produced crude petroleum and natural gas from 11 oilfields and gasfields in Offshore West and East, which included Southwest Ampa, Champion, Enggang, Fairley, Fairley-Baram, Iron Duke, and Magpie, and Land/Coastal area, which included Rasau and Seria-Tali. According to a BSP report, 90% of its output was from offshore. The company had 600 active wells, 200 structures with pipeline networks, and 4 manned production complexes offshore. In an effort to consolidate this extensive infrastructure, BSP planned to reduce

the manned production complexes from four to three and then to two (World Oil, 2000). In 2000, BSP let a \$100 million contract for design and construction of a compression plant for the LNG complex at Lamut and another contract for building a new gas pipeline and metering station to a new powerstation at Tutong (International Petroleum Encyclopedia, 2000; World Oil, 2000). The compression plant, which included a slug catcher and three 22-megawatt compressor sets, was scheduled to be operational in mid-2002.

In oil and gas exploration, four exploration and appraisal wells were drilled in 1999 compared with seven in 1998. According to Wood Mackenzie Consultants, seven block licenses were active in 2000. BSP had one onshore and three offshore licenses. EPA and Fletcher Challenge had one each offshore (World Oil, 2000). Fletcher Challenge spudded the first exploration well on Block BCD in April. The BSA-1 wildcat explored various targets at 1,360 to 3,700 meters. The shallower horizons were thought to be potentially oil bearing, and the deeper zones, to be gas and condensate-prone (Oil and Gas Journal, 2000a). In August, Fletcher Challenge announced that it was curtailing its exploration program after its third well East Egret failed to find any significant amount of oil and gas (U.S. Energy Information Administration, November 2000, Brunei—Oil, Country Analysis Brief, accessed December 6, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/brunei2.htm>).

In an agreement signed in October, Shell Overseas Holdings Ltd. was to acquire Fletcher Challenge subsidiaries with operations in Brunei and New Zealand. The transaction was expected to close in the first quarter of 2001 with an effective date of July 1, 2001 subject to approvals by Fletcher Challenge's shareholders and Government regulatory agencies and court (Canada NewsWire, October 2000, Apache joins

Shell to acquire Fletcher Challenge assets; Apache buys Canadian properties, Shell gets New Zealand and Brunei, accessed October 12, 2000, at URL <http://www.newswire.ca/releases/october2000/09/c1240.html>).

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## Major Source of Information

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TABLE 1  
BRUNEI: PRODUCTION OF MINERAL COMMODITIES 1/

Commodity 2/		1996	1997	1998	1999	2000
Cement	thousand metric tons	250 e/	250 e/	216	208	232
Gas, natural:						
Gross	million cubic meters	11,152	11,135	10,704 r/	11,206 r/	10,751
Marketed	do.	10,210	10,195	9,863 r/	11,627 r/	10,751
Petroleum:						
Crude 3/	thousand 42-gallon barrels	62,269	59,500	57,446 r/	66,741 r/	70,482
Refinery products:	do.					
Gasoline	do.	1,420 r/ e/	1,460 r/ e/	1,572 r/	1,630	1,578
Distillate fuel oil	do.	910 r/ e/	970 r/ e/	1,093 r/	1,146	1,063
Residual fuel oil	do.	440 r/ e/	440 r/ e/	481 r/	531	475
Other 4/	do.	700 r/ e/	700 r/ e/	776 r/	659	677
Total	do.	3,470 r/ e/	3,570 r/ e/	3,922 r/	3,966 r/	3,793

e/ Estimated. r/ Revised.

1/ Table includes data available through March 23, 2001.

2/ In addition to the commodities listed, crude construction materials, such as sand and gravel and other varieties of stone, presumably are produced, but available information is inadequate to make reliable estimates of output levels.

3/ Includes condensate.

4/ Includes jet fuel, kerosene, refinery fuel, and refinery losses.

Sources: Prime Minister's Department, Petroleum Unit and U.S. Geological Survey Minerals Questionnaire, 1999 and 2000.