BRAZIL

By Celso Pinto Ferraz

2002 was dominated on the domestic scene by the uncertainty caused by the presidential election in the final quarter of the year and, internationally, by low growth of the world's main economies, by the accounting scandals affecting some of the largest US corporations and by political uncertainty in Middle East. These factors were sufficient to postpone the necessary new investments to invigorate the Brazilian economy.

Brazil's elections passed off very calmly and rapidly, and the beginning of a transition process sponsored by the previous government to consolidate the democratic system in the country, plus the new government's declarations to continue efforts towards structural reforms, lifted the pessimism that had been prevalent in the run-up to the elections. Nevertheless, the situation led to a rise in inflation despite the new government's primary objective of controlling inflation. The inflation rate in 2002 reached12.2% after 7.9% in 2001 and far higher than the 3.5% target for the year. In 2003 the inflation target is 4.5%, with a tolerance of + or – 2.5%. In 2004 the target is 3.75%.

The Brazilian economy in 2002 grew by just 1.5%, unchanged from 2001, and GDP grew from BR 1,200 billion (US$510.4 billion) to BR1,321 billion (US$451.0 billion). The trade balance, for the second consecutive year and after six years of deficits, showed a surplus of US$13.1 billion compared with US$ 2.64 billion in 2001. Exports were worth US$60.3 billion, 3.6% up on 2001, and imports were down 15% to US$47.2 billion. In December 2001, the exchange rate was BR2.32 to the dollar and in December 2002 the rate was BR3.53. Brazil's monetary reserves were US$35.86 billion at the end of 2001, and at the end of 2002 they stood at US$37.82 billion. The value of gold held in this reserve increased from US$303 million in 2001 to US$375 million in 2002.

Industrial output grew by 2.5% and the extractive mineral industry grew by 10.7%. Exports benefited from the depreciation of the real in relation to the dollar and grew above the average. The steel industry increased production by 11% to 29.6 Mt. On the other hand, the cement industry output decreased by 2.3% to 38.03 Mt.

Petrobrás, the state oil company, performed well; successive production records were registered and average daily production reached 1.81 Mbbl/d of oil equivalent, 11% higher than in 2001 and comparing with an average of 9.8% for the past five years. There were new discoveries in the Campos, Santos and Potiguar basins, reserves increased by 14% in relation to 2001 and there was the replacement index reached 303%. In 2002, Petrobrás became the largest Brazilian exporter, with US$3.5 billion, followed by Embraer (jet airplanes) with US$2.4 billion and Companhia Vale do Rio Doce (CVRD; iron ore) with US$1.8 billion.

In 2002, the National Department of Mineral Production (DNPM) issued 9,309 exploration licences, down from the 11,225 issued in 2001. Between 1992 and 1999, the annual average of mining authorisations (Portaria de Lavra) was 128. They amounted to 300 in 2000, 309 in 2001 and 362 in 2002, an increase of 17.2% in relation to the previous year. Also, during 2002, the DNPM opened 7,017 areas for exploration that were relinquished by companies.

During the year, the Supreme Court denied appeals against the government's charge for occupation of mineral areas (BR1.00/ha). This charge rate collected BR10 million in 2000, BR16 million in 2001 and BR17.8 million in 2002. These charges exclude the amounts deposited by CVRD, in judgement, totalling some BR13 million since 1998.

Aluminium

Bauxite production in 2002 rose by 32% to an estimated 18.2 Mt. Of this total, Mineração Rio do Norte (MRN) accounted for 14.2 Mt. MRN is a joint venture between CVRD/Aluvale (40%), BHP Billiton (14.8%), Alcoa (13.2%), Alcan (12%), Cia Brasileira de Aluminio (CBA) (10%), Norsk Hydro (5%) and Reynolds (5%). The remainder was produced by the mines of CBA, Alcoa, Alcan, Mineração Curimbaba and MSL Minerais SA. About 500,000 t of this production was refractory-grade bauxite produced mainly by two companies, Mineração Curimbaba and MSL. Bauxite exports in 2002 were 3.37 Mt, 1.71% down on 2001 and valued at US$90.8 million, 7.8% lower.

MRN invested US$112 million to expand annual production capacity at the Trombetas mine in Amazonas to 16.3 Mt/y by the end of 2005. The total budget for the project will be about US$230 million. MSL, in view of the depletion of its reserves of refractory-grade bauxite, is preparing to suspend operations indefinitely, probably at the end of 2003. The decision has been based on current market conditions for refractory bauxite, which provide little economic incentive for making the necessary investment required to allow operations to continue using MSL's other reserves. MSL is a subsidiary of Caemi, now under the control of CVRD. Elsewhere, Mineração Curimbaba is increasing its mine production capacity by 50,000 t to 330,000 t/y at a cost of around US$65 million.

During the year, Aluvale, CVRD's aluminium subsidiary, assumed 100% control of Mineração Vera Cruz by paying BR6.4 million to acquire 64% of the social capital from the Paranapanema group. Vera Cruz possesses 18 areas of mineral rights in the Paragominas area of Pará State containing an estimated 878 Mt of reserves, located near other CVRD bauxite areas.

The Alunorte alumina refinery, operated by a consortium comprising Aluvale (57.03%), Norsk Hydro (34.03%), Nippon Amazon Aluminium (4.05%), CBA (3.62%) and JAIC (1.27%), sold 1.59 Mt of alumina in 2002, up 3.2% on the 1.54 Mt sold in the previous year. Total Brazilian alumina production was about 3.5 Mt. Alumina exports in 2002 were 1.13 Mt, valued at US$171 million. In April 2003 Alunorte inaugurated its third production line to make it the largest alumina refiner in South America and the fifth-largest in the world,

with an annual capacity of 2.4 Mt. The company also embarked on a new US$ 900 million expansion that should double its capacity to 4.2 Mt/y in second half of 2005 and make it the world's largest producer. The Alumar refinery (Alcoa 54%, BHP Billiton 36%, Alcan 10%) has an annual capacity of 1.3 Mt.

Last year, Brazil's primary aluminium production rose by 16.2% to 1.31 Mt. The Albrás facility at Vila do Conde in Pará (Aluvale 51% and Japanese companies 49%) produced 416,100 t; Alcoa 284,100 t; CBA (Votorantim group) 248,800 t; BHP Billiton 214,000 t; Alcan 102,000 t; and Aluvale 50,600 t. The Alumar smelter (Alcoa 53.66% and BHP Billiton 46.34%) at São Luiz, Maranhão, reported production of 368,400 t; CBA's plant at Mairinque in São Paulo produced 248,800 t; the Valesul plant (Aluvale 54.5% and Billiton 45.5%) at Santa Cruz, Rio de Janeiro, 92,900 t; the Alcoa plant at Poços de Caldas, Minas Gerais 87,400 t; and the Alcan plants at Ouro Preto in Minas Gerais and Aratu in Bahia produced 49,500 t and 52,500 t, respectively.

The Alumar refinery at Maranhão is investing US$550 million in an expansion programme. Albrás completed a capacity expansion to 45,000 t/y in October, 2001. Albra's new primary aluminium production capacity is 406,000 t/y. It is the biggest aluminium smelter in Brazil. The CBA, in 2002, continue its expansion project for increasing annual production capacity from 240,000 to 340,000 t, which includes the investment of approximately US$350,000,000 in the acquisition of equipment, plant expansion, construction of a hydroelectric in Pirajú on the Paranapanema river, in addition to participation in the construction project consortium of the plant of Machadinho on the Pelotas river, in the state of Santa Catarina. A second stage to increase to 500,000 t/y to be completed in 2006/07 is already under study in the company.

In 2002, Brazil's imports of aluminium in all forms totalled 122,916 t (worth US$365 million), 10% less than in the previous year. Exports reached 865,000 t (worth US$1.26 billion), 20% more than in 2001. The supply of primary aluminium to the domestic market was 4% higher, at 575,000 t.

In 2002, Brazil recycled 87% of all the cans of aluminium consumed, corresponding to a volume of 121,100 t of aluminum cans, or about 9 billion units. Those numbers indicate an increase of 2.6% over 2001. This rate, calculated by the Brazilian Aluminum Association, maintains the country as the leader in aluminium-can recycling among those countries where recycling is not mandatory by law.

Alcoa intends to sell its investment in Latas de Aluminio SA (Latasa) in connection with the divestitures announced in the 2002 fourth quarter. Latasa is owned 37% by Alcoa, 39% by Bradesco Seguros SA, 12% by J P Morgan International Capital Corp., and 12% by others. Latasa, which is managed by Alcoa, manufactures and recycles aluminum beverage cans in Brazil and owns subsidiaries in other South American countries that also manufacture and recycle aluminum beverage cans.

The aluminium companies won the right to build new hydroelectric plants in the auction of the National Agency of Electric Power (Aneel). They secured

eight concessions that will demand total investments of about BR 4 billion. Alcoa participates in a consortium that owns the Machadinho hydroelectric power plant in southern Brazil, which began to generate power at full capacity in mid-2002. Alcoa now receives its share of the output of the plant, which is sufficient to cover the remaining 51% of its operating needs at the Poços de Caldas smelter.

Alcoa has entered into agreements to participate in five additional hydroelectric construction projects in Brazil that are scheduled to be completed at various dates ranging from 2005 to 2008. These projects are: Barra Grande, Santa Isabel, Pai-Querê, Serra do Facão and Estreito. Alcoa's share of the output from the hydroelectric facilities, when completed, ranges from 19% to 42%. Total costs for all five projects are estimated at US$1.7 billion, with Alcoa's share of total project costs totalling approximately US$460 million. Financing for these projects is in various stages of development, with the Barra Grande project under construction. The future of the Santa Isabel project is subject to receiving appropriate regulatory licences.

Alcoa may be required to provide guarantees of project financing or commit to additional investments as these projects progress. By December 31, 2002, Alcoa had provided US$120 million of guarantees on these six hydroelectric projects in the form of debt guarantees or performance bonds. Alcoa intends to supply all the power for its smelters by 2007 or 2008 when will be producing about 800 MW and consuming 620 MW.

Alcan is also aiming towards self-sufficiency in the supply of electric power to its smelters. At present, it generates only 10% of the energy that it consumes and purchases the remaining 90% from Cemig and Chesf under contracts that begin to expire in 2003. In the auction of Aneel, Alcan secured the right to build hydro-electric plants at Caçu and Barra dos Coqueiros, in Goiás, and Traíra II, in Minas Gerais. The company intends to invest US$180 million in the construction of the three projects. Alcan paid BR4.6 million annually for the concession for the 60 MW Traíra I plant.

On the environmental front, Alumar plans to use bauxite residue as a soil corrective in agricultural applications. The process to prepare the residue involves mixing it with seawater, and has already been used successfully by Alcoa at its units in Australia. There, the process has enabled a pH similar to limestone to be obtained, and has revitalised the soil and improved the retention of water and fertilisers. Alumar generates some 900,000 t/y of bauxite residue.

Coal

Brazil's run-of-mine (ROM) coal production fell 10.7% last year, to 10.0 Mt, from 11.2 Mt in 2001, and the marketable output fell 8.9% to 5.1 Mt. Copelmi

was the largest producer with ROM output of 1.89 Mt, followed by CRM at 1.82 Mt, Rio Deserto at 1.16 Mt, Metropolitana at 1.29 Mt and Criciuma at 1.27 Mt. In 2002, domestic sales reached 5.8 Mt and were used in the three southernmost states: Santa Catarina (51.9%), Rio Grande do Sul (47.8%) and Parana (1.3%). Brazil's requirements for metallurgical coal imports decreased from 14.79 Mt to 13.01 Mt in 2002, valued at US$633 million, 11.6% higher than in 2001. The coal was purchased mainly from the US (30.3%), Australia (24.5%), China (15.6%), Canada (9.2%) and South Africa (4.7%).

Following Brazil's first power rationing period in 2001, consumers learned how to use less electric power in the home and, since then, consumption has remained lower than former levels. As a consequence, the federal government and the power utilities are now re-appraising the Priority Programme for Thermoelectricity. This programme involves 49 power stations, based mainly on natural gas, with three of them based on coal.

Copper

Production of copper in concentrates fell in 2002 by 11.0% to 30,642 t and was recovered at the country's only copper mine, owned by Mineração Caraíba (MSB group) in Bahia. Total primary metal production grew by 15% to 212,243 t produced by Caraiba Metais (Paranapanema Group). In 2002, 462,934 t of concentrates valued at US$197 million were imported for smelting and refining, a decrease of 27.1% on 2001. To meet primary copper demand of around 240,000 t/y, imports of primary copper in all forms in 2002 totalled 103,000 t (US$166 million), a decrease in volume terms of 30%, compared with 2001, and 34% lower by value. With primary copper exports of just 51,219 t (US$ 78.6 million), this sector of the mining industry recorded a trade deficit of 51,781 t (US$87.7 million).

CVRD and Antofagasta, one of the largest Chilean copper producers, formed a joint venture called Cordillera de las Minas S.A (Cordillera), incorporated to develop mineral exploration activities near Cuzco in southern Peru. The area covers some 60,000 km² and is considered to have promising exploration potential. Other important mining investments are located there. Anaconda Peru SA (Anaconda), Antofagasta's subsidiary, transferred mining rights to Cordillera, retaining a total participation of 99.9%; CVRD established Compañía Minera Andino-Brasilera (CMAB), which holds a participation of 0.1% in Cordillera; CVRD/CMAB has the option to acquire a 50% stake in Cordillera, after having invested US$6.7 million in exploration over a three-year period. This transaction is a strategic move for CVRD, in line with the internationalisation of its activities. It also reaffirms CVRD's emphasis on developing a copper-mining sector and follows its acquisitions in Brazil of the total capital of Mineração Serra do Sossego SA and Salobo Metais SA. Anglo American's share of Salobo represented 50% of the capital worth BR136.1 million.

CVRD is developing six projects in southern Para. They are located within a radius of 90 km from Carajás, three of them to the southeast (Sossego, Alvo 118 and Cristalino) and three to the northeast (Igarape Bahia Fase IV, Alemão and Salobo). The Sossego project is under construction and the

estimated start-up is 2004 with an annual production of 140,000 t of copper and 3.0 t of gold. Salobo has reserves of 784 Mt averaging 0.96% Cu and 0.6 g/t Au. CVRD is giving priority to this project, and is currently considering the optimum processing technology that should be used to recover the copper. The other projects are less advanced but they already have all hallmarks of being substantial operations in the region. It is estimated that by 2008, all six projects should be in production.

Gold

Gold production in 2002 is estimated to have been around 38 t (38,000 kg) comprising 34 t from mining companies and about 4 t from *garimpo* operations. This represents a decrease of 3.5 t in mining companies' production compared with 2001. Exports rose last year by 4% to US$349.2 million, from US$335.7 million in 2001. Output by CVRD, the biggest producer, fell by 5,505 kg to 10,310 kg.

AngloGold, the second-largest gold producer, reported production of 6,376 kg from Mineração Morro Velho and 5,847 kg from Mineração Serra Grande (Anglo – TVX). Rio Paracatu Mineração (Rio Tinto 51%, Autram 49%) is the third-largest gold producer and reported a production of 6,998 kg. In fourth place, São Bento Mineração (Eldorado Gold Corp.) produced 3,220 kg.

AngloGold is concluding the process of world restructuring that began in 1998. Exploration and mining in Latin America in now one of the company’s priorities. Brazil will be a beneficiary, and between 2002 and 2006 AngloGold could invest US$200 million on exploration and the development of new mines. Of this year's total budget of US$50 million, AngloGold has allocated US$13.2 million for Latin America, of which Brazil will receive US$6 million. It is also planning an expansion at the Cuiabá mine in Sabará (Minas Gerais), which will be deepened to 350 m at a cost of US$17 million as part of an overall investment of US$140 million. In the state of Amapa, the viability study for the Amapari mine project is in its final stage and will require an investment of US$40 million. The mine will be capable of producing 150,000 oz/y and operations are scheduled to start at the end of 2003.

The CVRD and Yamana Resources of Canada, signed an agreement last year for the sale of CVRD's Fazenda Brasileiro gold mine for US$20.9 million. Fazenda Brasileiro is located in the state of Bahia, in the northeastern region of Brazil, and was operated by CVRD for over 15 years. In 2002, it produced 153,000 oz (4,759 kg). For 2003, the estimated production is 112,000 oz (3,484 kg). With the sale of this asset, CVRD’s gold production will be temporarily interrupted until copper projects begin their operations by mid-2004 (when gold will be produced as a by-product). Furthermore, CVRD is investing in mineral exploration aiming at the discovery of new gold reserves. It is estimated that by 2007, the total amount of gold produced by CVRD each year will reach 950,000 oz (29,500 kg).

Iron Ore

In 2002, iron ore was Brazil's main export commodity, accounting for 5% of the total value of Brazilian exports of US$60.3 billion. Marketable iron-ore

production rose by 1.4% to 215.5 Mt, whilst exports decreased by 0.7% to about 156 Mt, worth US$2.93 billion. Exports went to 40 countries, the biggest customers being China (taking about 16.5% of total shipments by value), Japan 15.6%, Germany 12.3%, Italy 6.8%, Belgium and Luxembourg 4.8%. Five companies account for more than 90% of production: CVRD, Mineração Brasileiras Reunidas (MBR), Ferteco, Samarco Mineração and Cia Siderúrgica Nacional (CSN).

CVRD inaugurated its 12th iron-ore pellet plant, located in the port of Ponta da Madeira, state of Maranhão. This plant is a wholly-owned asset of CVRD and is expected to reach full nominal capacity of 6 Mt/y this year. This plant brings CVRD's consolidated pellet production capacity to 43 Mt/y. The new plant is the most automated of its kind in the world, using new concepts of network communication using fibre optics and intelligent instruments which send data already processed to control computers. Total capital expenditure for the project was US$408 million and comprises investments in plant construction and all the infrastructure for the project. Investments were also made to increase capacity at the Carajás iron-ore mines, the Carajás Railroad and at the port of Ponta da Madeira to cope with the extra volume generated by the new plant. The plant's investment cost per tonne of installed capacity is US$31.

CVRD and Nucor Corp. (Nucor), signed a non-binding memorandum of co-operation for the purpose of advancing their mutual interests in the identification of potential iron and steel business opportunities, to be jointly developed in the following areas: projects that offer low cost, environmentally friendly iron-based products; projects that offer strategic positions in North and South America; opportunities that may arise as a result of the restructuring of the North American steel industry which are deemed to be advantageous.

Nickel

Production of electrolytic nickel, nickel in ferronickel alloys and nickel in matte reached 29,950 t in 2002, 8.2% lower than the 32,624 t reported a year earlier. Production by Cia Niquel Tocantins (Votorantim group) reached 17,676 t of electrolytic nickel, while Codemin (Anglo American) produced 6,010 t. Rio Tinto's Mineração Serra da Fortaleza operation produced 6,264 t of contained nickel in matte a 38.4% decrease on the 10,170 t in 2000. Serra da Fortaleza, changed its operation from open-pit to underground mining and is improving its mining performance to achieve its full capacity. In 2000, the plant processed 462,450 t of ore and produced 8,738 t of matte. In 2001, these numbers were 598,649 t and 10,170 t and, in 2002, they were 422,121 t and 6,264 t.

Matte exports decreased to 13,832 t worth US$31.4 million, compared with 20,038 t worth US$48.9 million in 2001. Exports of electrolytic nickel increased to11,226 t, worth US$72.3 million, compared with 9,614 t worth US$56 million in 2000. Exports of ferronickel increase by 35.1% from 2,518 t worth US$4.7 million, to 3,401 t worth US$6.6 million. Imports of ferronickel

were insignificant but imports of primary nickel totalled 12,934 t worth US$85.7 million, compared with 8,899 t worth US$67.7 million in 2001.

CVRD's Vermelho project is at the stage of pre-feasibility. It is estimated that it will cost US$ 700 million and start-up will be in 2008 with a production of 45,000 t of nickel.

Tin

Production of tin-in-concentrate decreased by 11.2% to 11,584 t last year. Mamoré Mineração e Metalurgia (Paranapanema group) produced 8,757 t, Cesbra 1,199 t and others 1,627 t. Refined output decrease by 1.6% to 12,030 t. Mamoré produced 8,819 t, Cesbra 1,352 t, Best 364 t and others 1,495 t. Exports fell by 6% to 6,027 t worth US$22.3 million, and were shipped mainly to the US (78.6%), Belgium (9.9%), Chile (4.4%), Italy (4.1%) and Argentina (2.8%). Accordingly, earnings from tin exports fell by US$3.6 million.

The Pitinga mine (Mamoré/Paranapanema group) will continue producing cassiterita from alluvial ore up to 2004 from retreat of old mine dumps. In 2002, US$5.2 million was invested in crushing equipment for mining the primary ore, US$1.0 million for operational improvement of mining and metallurgy and US$900,000 at the chemical plant for the production of niobium oxide and tantalum oxide. In 2002, the production of tantalum oxide was 35 t, 30% less than the 50 t produced in 2001. The production of niobium oxide was 499 t, 70% more than the 293 t produced in 2001.

Zinc

Zinc metal output rose in 2002 by 26.6% to 249,434 t. Cia Mineira de Metais (Votorantim group) produced 156,568 t (62.8% of the total) up 31.9% from 2001, mainly from domestic concentrates treated at the Tres Marias metallurgical plant. Output from Cia Paraibuna de Metais, at its Juiz de Fora complex in Minas Gerais, rose by 18.5% to 92,866 t (40.5% of the total) and was based exclusively on imported concentrates.

To meet primary zinc demand of about 207,000 t/y, imports of zinc in all forms in 2002 totalled 18,871 t a decrease in volume terms of 50% compared with 2001, and 55.1% lower by value (US$17 million). Zinc exports in 2002 totalled 59,695 t (US$47.4 million), hence the trade surplus was 40,824 t valued at US$30.5 million. Imports of zinc concentrate increased by 28.8% to 236,735 t worth US$51.2 million, compared with 183,791 t worth US$52.5 million in 2001.

Cia Mineira de Metais continued with its US$150 million expansion programme at the Vazante and Morro Agudo mines, and at the Tres Marias plant. By the end of 2004, this will have increased capacity from the current 114,000 t/y to 160,000 t/y. Feasibility studies for a further expansion to 240,000 t/y have already begun. On March 27, 2002, Votorantim acquired 100% of Cia Paraibuna de Metais for BR232 million and is now Brazil's only zinc producer.

Phosphate

Brazil's production of phosphate concentrate rose by 1.6% in 2002 to an estimated 4.9 Mt of concentrate. Four companies account for about 94% of production: Fosfértil (Fertifos group) 34%, Bunge Fertilizantes 30%, Ultrafértil (Fertifos group) 15% and Copebras (Anglo American) 15%. Imports of phosphate concentrate increased by 4.4% to 1.05 Mt worth US$48 million, compared with 1.0 Mt worth US$50.0 million in 2001.

Fosfertil and its subsidiary, Ultrafertil, have as their principal shareholders the Fertifós Group (81.54%) and CVRD (10.96%). Fertifós is controlled by Bunge (52%), Cargill (33%), Fertibras (12%) and Fertiza (10%). In 2001, the company maintained its position as the principal producer of phosphate and nitrate-based fertilisers. The phosphate is produced from its mines at Tapira and Patos de Minas in Minas Gerais (Fosfertil) and Catalão in Goias (Ultrafertil). In 2002, the Tapira mining complex produced 11.4 Mt of crude ore and the Catalão mining complex produced 4.9 Mt, and both produced a total of 2.6 Mt of phosphate concentrate. The Tapira mining complex recently increased its installed capacity from 1.6 Mt to 2.0 Mt/y of concentrate. At Patos de Minas, installed capacity is 150,000 t/y and at Catalão (Ultrafértil), capacity is around 1.0 Mt/y of concentrate.

Bunge Fertilizantes has two mines, at Araxá in Minas Gerais and at Cajati in Sao Paulo. It is organised into two business units: fertilisers and animal-feed nutrients. Due to the quality of the phosphate rock found at Cajatí, mine output there is destined exclusively for products for animal and human nutrition. At Araxá, output is principally used in the production of phosphate for use in agricultural fertilisers. In 2002, Cajati produced 5.6 Mt of crude ore and Araxa produced 5.5 Mt. In total, Bunge produces around 1.4 Mt/y of phosphate concentrate. A new mine (Salitre) is scheduled to begin operations in 2004, at which time annual production is expected to be 4.8 Mt/y of crude ore.

Copebrás (Anglo American) produces around 15% of the total Brazilian production of phosphate concentrate or some 720,000 t/y from Catalão in Goias. In March, 2003, Copebras inaugurated its new US$104 million mining and chemical complex in Catalão to produce superphosphate and to expand its mining capacity to 1.2 Mt/y of concentrate. Copebras will receive a concession for a new phosphate deposit after 20 years of legal dispute with Fosfertil/Ultrafertil. This deposit, located in Catalão, is known as ‘Area 5’ and has 27 Mt of reserves.

Brazil's demand for fertilisers reached a record of 19.11 Mt in 2002, 12% more than in 2001. National production grew by 8.6% to 8.25 Mt, but the country continued to be dependent on imports, which rose by 7.7% to 10.5 Mt.

Oil

Agencia Nacional do Petroleo (ANP) staged its fourth auction of oil exploration permits during 2002 and the results were not so good as in the previous auction. A total of 17 oil companies participated in the bidding process for 54 blocks, one more than the third auction. No offers were

received for 33 blocks but 21 were sold, for about BR92 million, an 85% decrease from the previous auction. The fifth auction (Round 5) will be held during 2003, and offers 21 blocks with a total of 192,135 km², for exploration, development and production of oil and gas. These areas are located in nine sedimentary basins.

In 2002, the average annual production was 1.5 Mbbl/d of oil, liquefied natural gas (LNG) and condensate, 0.7% above the target of 1.49 Mbbl/d, for a growth of 12% from 2001. Natural-gas production was 40.05 Mm^3/d for a total average daily production of 1.75 Mbbl of oil equivalent, which represents an increase of 12% in relation to the prior year. Petrobras's production goals of 1.90 Mbbl/d by 2005, remain in place. The goal implies an 8.4% annual growth in production for the 2000-05 period. Offshore production of oil, LNG, condensate and natural gas corresponded to 84% of the total, of which 80% derived from systems located in water depths exceeding 400 m. By 2005, the company plans to reach a 1.9 Mbbl/d production rate in Brazil and to produce nearly 75% of this from deep and ultra-deepwater (> 1,000 m). The cost of oil produced was US$3.00/boe (barrels oil equivalent) compared with US$3.26/boe in 2001. The reserves grew 14% in 2002 to 11 billion boe.

During 2002, the supply of natural gas reached 36.12 Mm^3/d. Of this total, 10.5 Mm^3/d was imported from Bolivia which represents a 41% increase in relation to 2001. Of this total, 24.83 Mm^3/d were sold in the market and the remainder was used by Petrobras.

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Mineral Exports

	2001[r]		2002[p]	
Commodity	**Volume**	**Value**	**Volume**	**Value**
	(US$ million)		(US$ million)	
Metallic:				
Iron ore (Mt)	156.0	2,932.0	166.5	3,048.0
Bauxite (Mt)	3.4	98.5	3.4	90.9
Manganese (Mt)	1.2	56.2	0.9	41.3
Chromite (t)	78,514	5.3	22,828	1.7
Non-metallic				
Asbestos (t)	53,917	21.2	99,341	28.8
Kaolin (Mt)	1.44	157.0	1.44	161.7
Graphite (t)	12,785	13.4	12,778	11.8
Magnesite (t)	56,508	6.7	67,349	9.5
Dimension stone (Mt)	1.01	255.2	1.15	312.0
Semi-Finished:				
Iron-steel (Mt)	9.29	2,278	11.60	2,914
Aluminium (Mt)	0.72	1,166	0.86	1,263
Tin (t)	6,454	26.02	6,065	22.38
Copper (t)	67,911	117.14	106,088	172.34
Silicon metal (t)	104,540	113.34	148,039	155.99
Nickel (t) [1]	29,963	108.17	25,059	103.70
Ferro-manganese	87,837	37.24	146,647	63.27
Ferro-chrome (t)	143	0.28	426	0.50
Ferro-niobium (t)	28,929	252.54	31,257	268.03
Ferro-nickel (t)	2,518	4.71	3,401	6.65
Ferro-silicon (t)	110,232	182.19	103,819	72.16
Zinc (t)	24,506	22.62	59,695	47.40

Source: MME/SMM; SECEX-MDIC. [r] = revised, [p] = provisional
[1]Except Ni in ferro-nickel.

Mineral Production

Commodity	2000[r]	2001[r]	2002[p]
Iron ore (Mt)	212	210	222
Bauxite(Mt)	13.8	13.8	18.2
Coal[1] (Mt)	6.79	5.64	5.14
Phosphate[2] (Mt)	4.72	4.80	4.88
Manganese[2] (Mt)	1.92	2.21	2.52
Copper[3] (t)	31,786	30,111	30,642
Tin[3] (t)	13,773	13,048	11,584
Chromium[4] (t)	253,248	299,502	280,000
Nickel[5] (t)	31,991	32,624	29,950
Niobium[6] (t)	18,218	24,864	27,000
Potassium[7] (t)	351,681	357,232	439,000
Zinc[3] (t)	100,254	111,432	133,322
Gold (kg)	52,000	53,200	38,058
Asbestos (t)	209,232	172,695	194,732
Kaolin[2] (Mt)	1.64	1.81	2.09
Fluorite (t)	43,000	43,734	47,899
Gypsum (Mt)	1.54	1.50	1.63
Magnesite[2] (t)	280,000	266,000	310,000
Natural gas (Mm³)	13,327	14,045	16,568
Petroleum ('000 m³)	74,000	75,224	84,440

Source: DNPM/DIRIM; SMM/MME.
[r] revised; [p] provisional;
[1] Marketable Coal; [2] concentrated or beneficiated; [3] metal content;
[4] Cr_2O_3 content; [5] electrolytic nickel, metal content in ferro-nickel alloy and in matte;
[6] Nb_2O_5 content; [7] K_2O content.