

BRAZIL

By Celso Pinto Ferraz

In 2003, Brazil's economic performance was affected by the government's need to control inflation and its goal of building a good reputation in terms of its fiscal and monetary policy. The government achieved these aims but, as a result, the economy contracted very slightly, by 0.2%, and unemployment remained high. The fiscal adjustment resulted in a primary surplus of 4.32% of GDP, above the 4.25% target. The rate of inflation was reduced during the period, growing by 9.3% after a 12.5% growth in 2002, although it was higher than the 8.5% target for 2003. In 2004, the inflation target is 5.5%, with a tolerance of plus or minus 2.5%. In terms of country risk, Brazil's ranking improved, from 1,430 points in 2002 to below 500 points by the end of the year.

The Brazilian economy in 2003 fell by 0.2% in constant prices and GDP grew from BR1,346 billion (US\$459.4 billion) to BR1,515 billion (US\$498.4 billion). The trade balance, for the third consecutive year and after six years of deficits, showed a record surplus of US\$25.1 billion compared with US\$13.3 billion in 2002 and US\$2.64 billion in 2001. Exports were worth US\$73.4 billion, 21% up on 2002, and imports were up 2.1% to US\$48.3 billion. In December 2002, the exchange rate was BR3.53 to the dollar and in December 2003 the rate was BR2.88. Brazil's official reserves amounted to US\$37.82 billion at the end of 2002, and by the end of 2003 they had increased to US\$49.29 billion. The value of gold held in this reserve increased from US\$375 million in 2002 to US\$450 million in 2003.

Industrial output grew by only 0.4% in 2003 and the extractive mineral industry grew by 2.4%. Exports benefited from the depreciation of the real in relation to the dollar and grew above the average. The steel industry increased production by 5.2% to 31.1 Mt, and exports increased by 11%. On the other hand, the output of the cement industry, which sells mainly to the domestic market, decreased by 11%, to 34 Mt, very far from the peak of 40 Mt produced in 1999.

Petrobrás, the state oil company, continued to achieve successive production records, with the average daily production reaching 2.03 Mbbbl/d of oil equivalent, compared with 1.81Mbbbl/d in 2002, 1.64 Mbbbl/d in 2001 and 1.56 Mbbbl/d in 2000. Proven reserves (using SPE rules) increased by 69%, from 1,122.7 Mbbbl of oil equivalent to 1,904 Mbbbl. In 2003, as in 2002, Petrobrás continued to be the largest Brazilian exporter, with exports worth US\$4.4 billion, followed by Companhia Vale do Rio Doce (iron ore) with US\$2.03 billion and Embraer (jet airplanes) with US\$2 billion. Petrobrás was also the largest Brazilian importer, with US\$4.7 billion followed by Embraer with US\$1.30 billion. CVRD's imports amounted to only US\$185 million.

In 2003, the National Department of Mineral Production (DNPM) issued 11,066 exploration licences, up from the 9,309 issued in 2002. Between 1992 and 1999, the annual average of mining authorisations was 128. Since then, they have amounted to 300 in 2000, 309 in 2001, 362 in 2002 and 303 in 2003, for an annual average of 318. The government charges an annual fee of BR1.06/ha for occupation of mineral areas. It collected BR10 million in 2000, BR16 million in 2001 and BR18.7 million in 2002 and BR 19.6 million in 2003. These charges exclude the amounts paid by CVRD, estimated to have totalled BR14.1 million between 1998 and January 2003.

Aluminium

Bauxite run-of-mine production in 2003 rose by 36% to an estimated 24.8 Mt. The marketable output grew by 29%, from 13.2 Mt to 17 Mt. Of this total, Mineração Rio do Norte (MRN) accounted for 14.2 Mt. MRN is a joint venture between CVRD/Aluvale (40%), Alcoa (18.2%), BHP Billiton (14.8%), Alcan (12%), Cia Brasileira de Alumínio (CBA) (10%) and, Norsk Hydro (5%). The remaining 3 Mt of bauxite were produced by CBA, Alcoa, Alcan, Mineração Curimbaba and MSL Minerais SA. About 300,000 t were refractory-grade bauxite produced mainly by two companies, Mineração Curimbaba and MSL. Bauxite exports of all types in 2003 grew by 39% in volume, to 4.7 Mt, and by 33% in value, to US\$121 million.

MRN completed its US\$203 million investment plan to expand annual production capacity at the Trombetas mine in Amazônia to 16.3 Mt/y. Full capacity will be achieved by the end of 2005. MSL, in view of the depletion of its reserves of refractory-grade bauxite, suspended operations indefinitely. MSL is a subsidiary of Caemi, under the control of CVRD. In 2003, MSL sold 100,600 t of calcined bauxite mined in 2002. Mineração Curimbaba increased its mine production capacity to 330,000 t/y.

Mineração Vera Cruz, an Aluvale subsidiary and part of the CVRD group, received all the environmental permits required to build a 230 km slurry pipeline to transport its ore from the Paragominas mine to the Alunorte refinery. The Platô Miltonia deposit, the first to be exploited, has 140 Mt, sufficient to guarantee supplies to the Alunorte Expansion II project at the rate of 4.5 Mt/y for a minimum 32 years.

Alcoa has yet to reach a final decision on its plan to build an integrated project to support a new smelter of 400,000–500,000 t/y capacity. The project could be completed by 2010 and would require an investment of US\$2.7 billion. The outcome of negotiations for new energy contracts with Eletronorte will be a key factor determining whether the project goes ahead.

Total Brazilian alumina production in 2003 was about 4.7 Mt, 34% higher than in 2002. Alumina exports were 1.95 Mt, valued at US\$334 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 the US\$583 million Alunorte Expansion II project that should double its refining capacity to

4.2 Mt/y starting in 2006 and make it the world's largest alumina producer. Engineering, contracting and construction activities are well ahead of schedule.

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 2,32 Mt of alumina in 2003, up 46% on the 1.59 Mt sold in the previous year. Alunorte's exports were worth US\$258 million compared with US\$16 million in 2002. The Alumar refinery (Alcoa 54%, BHP Billiton 36%, Alcan 10%) has an annual capacity of 1.3 Mt. The refinery, located at São Luiz Maranhão, is to be expanded from 1.3 Mt to 3.5 Mt/y capacity at a cost of US\$700 million. This expansion will require an expansion of the Alumar port facilities.

Last year, Brazil's primary aluminium production rose by 4.7% to 1.38 Mt. The Albrás facility at Vila do Conde in Pará (Aluvale 51% and Japanese companies 49%) produced 435,900 t; CBA (Votorantim group) 313,800 t; Alcoa 275,500 t; BHP Billiton 197,300 t; Alcan 106,500 t; and Aluvale 51,600 t. The Alumar smelter (Alcoa 53.66% and BHP Billiton 46.34%) at São Luiz, Maranhão, reported production of 334,900 t; CBA's plant at Mairinque in São Paulo produced 313,800 t; the Valesul plant (Aluvale 54.5% and Billiton 45.5%) at Santa Cruz, Rio de Janeiro, 94,600 t; the Alcoa plant at Poços de Caldas, Minas Gerais 94,900 t; and the Alcan plants at Ouro Preto in Minas Gerais and Aratu in Bahia produced 50,200 t and 56,300 t, respectively.

Albrás' new primary aluminium smelter has a production capacity of 430,000 t/y and it is the largest aluminium smelter in Brazil. The 2003 record production was a result of a rise in the electrical current used in the reduction process from 163.78 kA in 2002 to 171.26 kA in 2003. CBA expanded its annual production capacity to 340,000 t/y in 2003, and has required an investment of US\$370 million. A further expansion to 385,000 t/y in 2006 has been initiated and a major expansion to 500,000 t/y, to be completed before the end of the decade, is already under study.

In 2003, Brazil's imports of aluminium in all forms totalled 99,993 t (worth US\$345 million), 5.4% less than in the previous year. Exports reached 890,562 t (worth US\$1.37 billion), 3.0% more than in 2002 in quantity and 8.9% in value terms. The supply of primary aluminium to the domestic market was 14.1% higher, at 659,000 t.

Alcoa sold its investment in Latas de Alumínio SA (Latasa) in accordance with the divestitures announced in the 2002 fourth quarter. Latasa was owned 37% by Alcoa, 39% by Bradesco Seguros SA, 12% by J P Morgan International Capital Corp, and 12% by others. Latasa, which was 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 new owner of Latasa, the UK Group Rexam, paid US\$315 million, plus US\$107 million to pay off Latasa's debts.

Brazil's aluminium companies have 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 require total investments of about BR4 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.

In addition, 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, will range 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. During the second quarter of 2003, the participants in the Santa Isabel project formally requested the return of the performance bond related to the licence to construct the hydroelectric plant as the project has been terminated. Alcoa may be required to provide guarantees of project financing or commit to additional investments as these projects progress. Alcoa intends to supply all the power for its smelters by 2007 or 2008 when it will be producing about 800 MW and consuming 620 MW.

BHP Billiton also joined two consortia with the objective of participating in concessions to build and operate proposed hydropower plants. The first (20.6% interest) also includes affiliates of Alcoa, CVRD, Votorantim and Camargo Correa Energia SA. In 2001 the consortium won the auction for the Santa Isabel Baixa concession and later signed the concession contract. The Federal Environmental Agency (IBAMA) has declared the project not viable as presented, therefore the consortium has requested ANEEL to return the concession guarantees and to revoke the concession agreement. In the second consortium (BHP Billiton 16.5%), the partners are affiliates of Alcoa, CVRD, Tractebel and Camargo Correa Energia SA. This consortium won the auction for the Estreito concession in July 2002. The Estreito concession contract was signed in December 2002 and is awaiting further definition of requirements from IBAMA regarding environmental issues before the project can be progressed further.

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. The construction of the Candonga hydro power plant in Brazil, with an installed capacity of 140 MW, has been completed at a total cost to Alcan of US\$47 million. Alcan participated equally in the facility with CVRD. Start-up is expected in the first quarter of 2004.

In 2003, Brazil recycled 89% of all the aluminium cans consumed, corresponding to a volume of 112,000 t of aluminum cans, or about 8.2 billion units. In 2002, the index was of 87%, the equivalent to 121,100 t, or 9 billion units. This rate, maintains the country as the leader in aluminium-can recycling among those countries where recycling is not mandatory by law.

Coal

Brazil's run-of-mine (ROM) coal production fell by 9.4% last year, to 9.1 Mt, from 10.0 Mt in 2002, and the marketable output fell by 9.3% to 4.6 Mt. Copelmi was the largest producer, with ROM output of 1.80 Mt, followed by CRM at 1.56 Mt, Metropolitana at 1.28 Mt, Criciuma at 0.98 Mt and Rio Deserto at 0.95 Mt. In 2003, domestic sales reached 4.96 Mt and were used in the three southernmost states: Rio Grande do Sul (49.8%), Santa Catarina (48.7%) and Parana (1.45%). Brazil's requirements for metallurgical coal imports increased from 13.01 Mt to 14.83 Mt in 2003, valued at US\$645 million, 1.8% higher than in 2002. The coal was purchased mainly from the Australia (30.4%), the US (27.1%), China (14.0%), Canada (12.3%) and South Africa (4.2%).

Copper

Production of copper in concentrates fell in 2003 by 9.1% to 27,867 t and was recovered at the country's only producing copper mine, owned by Mineração Caraíba (MSB group) in Bahia. The new Sossego mine (CVRD group) in Pará State, northern Brazil, started production in June 2004.

Total primary metal production in 2003 fell by 7.6% to 173,378 t, all produced by Caraiba Metais (Paranapanema Group). A total of 412,625 t of copper concentrates valued at US\$195 million were imported for smelting and refining, a decrease of 10.8% in tonnage on 2002. To meet primary copper demand of around 306,000 t/y, imports of primary copper in all forms in 2003 totalled 153,000 t (US\$272 million), an increase in volume terms of 48% compared with 2002, and 63.3% higher by value. With primary copper exports of just 20,260 t (US\$35.5 million), this sector of the mining industry recorded a trade deficit of 133,740 t (US\$237.1 million).

CVRD's emphasis on developing a copper-mining sector is clear from its decision to acquire the total capital of Mineração Serra do Sossego SA and Salobo Metais SA. CVRD is developing five projects in southern Pará. They are located within a radius of 90 km from Carajás, three of them to the southeast (Sossego, Alvo 118 and Cristalino) and two to the northeast (Alemão and Salobo). The Sossego project involves an investment of US\$413 million and the estimated start-up is 2004 with an annual production of 140,000 t of copper concentrate and 3.0 t of gold. It will mark CVRD's first production as a copper miner.

Sossego includes a mine, mill, beneficiation plant and transport for the concentrates produced. The mine and processing installations are situated in the municipality of Canãa dos Carajás, roughly 80 km from Parauapebas, Pará. During 2003, CVRD's copper activities were focussed on preparing the Sossego operations. The mine started running on August 31, 2003, with the

opening of the Sequeirinho open pit and the movement of 1.93 Mt of ore and waste. This exceeded the forecast target of 1.8 Mt/y. The other projects should begin operations by 2010. When fully running, collectively they will be producing 690,000 t/y of copper in concentrates.

Gold

Gold production in 2003 is estimated to have been the same as 2002, at around 38 t (38,000 kg) but only 25.3 t was produced by mining companies, the remainder, 12.7 t, coming from *garimpo* operations. This represents a decrease of 9 t in mining companies' production compared with 2002. Exports fell last year by 6.3% to US\$327.1 million (28,281 kg), from US\$349.2 million (35,339 kg) in 2002.

AngloGold (now AngloGold Ashanti), now the largest gold producer, reported production of 7,091 kg from Mineração Morro Velho and 5,909 kg from Mineração Serra Grande (Anglo – TVX). Rio Paracatu Mineração (Rio Tinto 51%, Autram 49%) is the second-largest gold producer and reported a production of 6,281 kg. In third place, São Bento Mineração (owned by Eldorado Gold Corp) produced 2,956 kg.

Output by CVRD fell by 1,919 kg to 5,505 kg, principally as a result of the shutdown of operations at Igarape Bahia in 2002, which was CVRD's largest gold mine. The sale of the Fazenda Brasileiro mine for US\$20.9 million in August 2003 to Yamana Gold Inc of Canada also contributed to CVRD's decline. In 2003, Fazenda Brasileiro produced 85,000 oz (2,643 kg) shared between CVRD (57.6%) and Yamana (42.3%) less than the 153,000 oz (4,759 kg) produced in 2002. 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). Fazenda Brasileiro's expected production for 2004 is 100,000 oz (3,110 kg).

AngloGold is conducting a feasibility study for the Cuiaba expansion project. The study began in 2003 and is expected to be completed by the second half of 2004. The project aims at expanding current capacity from 2,400 t/d to 4,000 t/d at an estimated capital cost of US\$110 million. Additional production is due to start in early 2006.

In 2003, AngloGold signed an agreement to sell its wholly-owned Amapari project to Mineração Pedra Branca do Amapari (EBX Gold 100%) for US\$18.2 million. The Amapari project is located in Amapá State in northern Brazil and AngloGold had failed to prove up enough additional reserves to develop a project of sufficient size to justify the management resources needed to run it effectively. AngloGold realised a loss of US\$3 million on the disposal of the Amapari project. The new owner, EBX Gold, plans to invest US\$60 million in 2004 and production is scheduled to start in 2005 at a rate of 5 t/y of gold.

Iron Ore

In 2003, iron ore was Brazil's second most important export commodity (after oil), accounting for 4.73% of the total value of Brazilian exports of US\$73.0

billion. Marketable iron-ore production fell by 8.7% to 218.7 Mt, whereas exports increased by 5% to about 174.8 Mt, worth US\$3.45 billion. Exports went to 40 countries, the biggest customers being China (taking about 22.1% of total shipments by value), Japan 13.2%, Germany 11.2%, Italy 6.5%, South Korea 5.8%. Four companies account for more than 90% of production: CVRD, Mineração Brasileiras Reunidas (MBR), Samarco Mineração and Cia Siderúrgica Nacional (CSN).

In 2003, for the fourth consecutive year, CVRD set an historic record, selling 187 Mt, 14% higher than the 164 Mt sold in 2002. Of the total sales, exports accounted for 136 Mt, 19% higher than the 115 Mt exported in 2002. CVRD's pellet plants produced 32.64 Mt, 13.6% higher than in 2002.

During 2003, CVRD and Nucor Corp of the US signed a contract to build and operate a pig-iron plant in northern Brazil with a capacity of 380,000 t/y, to be supplied by iron ore from Carajás. Nucor will purchase the entire production and invest US\$10 million in the project. The 2003 merger of CVRD with Celmar SA, a pulp and cellulose manufacturer, will enable one of Celmar's eucalyptus plantations to be used to produce charcoal for the pig-iron plant (an environmentally sustainable solution). Nucor will capitalise 80,000 ha of land and forest assets of Celmar and the total value of the investment will be US\$80 million.

MBR (part of the Caemi group, itself controlled by CVRD) produced 38 Mt of iron ore, 15% higher than the 33 Mt produced in 2002. MBR received the environmental permits (operating licence) to begin the Capão Xavier project and this will consolidate a production increase to 40 Mt/y.

Samarco produced 15.7 Mt of iron ore in 2003 (including 13.4 Mt of pellets), slightly higher than the 15 Mt produced in 2002 (including 11.7 Mt of pellets). Samarco is evaluating a plan to investment about US\$550 million to include: a third pellet plant, a second ore pipeline and improvements in mining operations in Minas Gerais. The company plans to expand its pellet production from the current 13.3 Mt/y to 21.4 Mt/y. Samarco will seek shareholders' approval in the first half of 2005 (CVRD 50% and BHP Billiton 50%). An investment of US\$25 million will be required to expand the capacity of the iron-ore pipeline to handle 16.5 Mt/y of iron-ore pulp, including the construction of a third pumping station. The expansion is expected to be completed by 2006. The pipeline, with its 396 km extension, will improve the transport of iron-ore slurry from Samarco's mines in Minas Gerais to pelletisation plants in Espírito Santo.

Cia Siderúrgica Nacional (CSN) produced 14.1 Mt of iron ore in 2003, 7.6% more than the 13.1 Mt produced in 2002. Of the total, 7.7 Mt was for CSN's own consumption and 6.6 Mt was sold to third parties through CVRD by mutual agreement. CSN is now questioning a clause in the agreement signed in April 2003, concerning unwinding of the cross shareholding with CVRD. The clause gives CVRD first preference to purchase ore from CSN's Casa de Pedra mine until the year 2031. CVRD used this right in 2003 and, with the iron-ore market strong, it could continue to exert its right for the next several

years. CSN plans to expand its production of iron ore from 14 Mt to 40 Mt/y and to build a 6 Mt/y capacity pellet plant.

Mineração Serra Geral, owned equally by CVRD and JFE Steel (formerly-Kawasaki) produced 7.4 Mt of iron ore in 2003, 59% more than the 4.6 Mt produced in 2002. The company plans to invest US\$47 million to increase production capacity to 10 Mt/y in 2005. JFE Steel intends to buy 2 Mt/y and the remainder will be sold to the Chinese market. Production could reach 15 Mt/y by 2009.

The Açominas steelworks, part of the Gerdau group announced the purchase of 500 Mt of iron ore reserves located about 16 km from the steelworks. Açominas consumes about 5 Mt/y of iron ore. The acquisition is due for completion in mid-2004, whereupon the company will announce a mining plan. The mining operations may be undertaken by a third party.

Nickel

Production of electrolytic nickel, nickel in ferronickel alloys and nickel in matte reached 30,513 t in 2003, 1.9% higher than the 29,950 t reported a year earlier. Production by Cia Níquel Tocantins (part of the Votorantim group) reached 18,155 t of electrolytic nickel, and Codemin (Anglo American) produced 6,048 t. Mineração Serra da Fortaleza (Votorantim group) produced 5,950 t of contained nickel in matte, a 5.0% decrease on the 6,264 t in 2002.

Matte exports decreased to 11,555 t worth US\$36.8 million, from 13,832 t worth US\$31.4 million in 2002. Exports of electrolytic nickel decreased to 10,905 t, worth US\$96.9 million, from 11,226 t worth US\$72.3 million in 2002. Ferronickel exports decreased by 6.7%, from 3,401 t worth US\$6.6 million, to 3,174 t worth US\$8.1 million. Imports of ferronickel were insignificant but imports of primary nickel totalled 15,067 t worth US\$134.3 million, compared with 12,935 t worth US\$85.7 million in 2002.

Cia Níquel Tocantins (CNT) is investing US\$65 million to expand nickel production from 18,000 t to 20,400 t/y and cobalt output to 1,200 t/y by mid-2004, and then to 23,000 t/y of nickel and 1,450 t/y of cobalt in 2005.

Codemin began the first-phase expansion of its annual production capacity, from 6,500 t of nickel content in ferronickel to 10,000 t in 2005. The second phase of the project will involve an investment of US\$700 million and will increase capacity to 40,000 t/y of nickel in ferronickel from 2007.

In line with Brazil's social responsibility code of conduct, which requires two years advance notice of mine closure, Mineração Serra da Fortaleza Ltda (MSF), part of the Rio Tinto group, announced in mid-year that the Fortaleza operations will close in 2005. The operations, which commenced early in 1998, include the underground mine, the concentrator, foundry and sulphuric acid plant.

At the end of 2003, Rio Tinto announced that it had agreed to sell its 100% interest in MSF to Votorantim Metais, a Brazilian-controlled mining company.

Votorantim Metais (VM) will purchase Rio Tinto's interests in Fortaleza for cash, which will include an adjustment for future nickel prices. The total cash consideration is expected to be at least US\$90 million based on current forward nickel prices. With the acquisition, VM will have increased its nickel production capacity by 50%. It expects the unit to produce 30,000 t/y of ore.

The Mineração Onça Puma project (Canico Resources Corp) is located in Pará, north-central Brazil, and is based on nickel laterite deposits discovered and explored in the 1970s by auger drill sampling and test pitting. The total inferred resources amount to about 104 Mt at 2.15% Ni and 0.11% Co using a 1.5% Ni cut-off. Over the past year there have been 14 diamond drill rigs operating on the project and over 3,400 holes have been completed. The total should reach 5,000 by the end of 2004.

In a November 2003 scoping study, Hatch Engineering reported that a single-line rotary kiln/electric furnace ferronickel plant, capable of processing about 1.2 Mt/y of ore, could cost US\$560 million. A doubling of this capacity could cost an additional US\$300 million. In this same study, estimates of mine life for a single-line plant was about 90 years. Annual nickel production was estimated to average about 27,000 t (59 Mlb) for the first 20 years of operation, at low cash costs. Canico is seeking the environmental licences for the project and had made presentations to the local communities about the scope of the enterprise.

Tin

Production of tin-in-concentrate in 2003 decreased by 4% to 12,083 t. Mamoré Mineração e Metalurgia (part of the Paranapanema group) produced 8,634 t, Cesbra 1,099 t, Coopersanta 1,395 t and others 954.7 t. Coopersanta (Co-operative of Small Miners of Santa Cruz Ltd) is responsible for mining the Bom Futuro deposit as a successor to EBESA.

Output of refined tin decreased by 8% to 10,583 t. Mamoré produced 7,654 t, Cesbra 1,012 t, Best 270 t, Coopersanta 178.2 t and others 1,468 t. Exports fell by 40% to 3,655 t, worth US\$16.2 million, and were shipped mainly to the US (78%), Argentina (11%), Netherlands (6%) and Belgium (4%). Accordingly, earnings from tin exports fell by US\$6.1 million. Imports totalled 955 t, 85.8% more than 2002 and worth US\$ 5.2 million, 113% more than in 2002.

The Pitinga mine (Mamoré/Paranapanema group) will continue producing cassiterite from alluvial ore until later in 2004 by retreating old mine dumps.

In 2003, a crushing line was installed at the Rocha Sã project and was able to process 300 t/h, corresponding to 30% of the operational capacity of the project. The remaining investment necessary to complete the project is around US\$20 million.

In December 2003, owing to increases in the prices of the inputs used in the production of niobium oxide and tantalum oxide, and lower prices for niobium

and tantalum products in the international market, the Mamoré chemical plant was closed indefinitely. In 2003, it produced 75 t of tantalum oxide, compared with 35 t in 2002. Production of niobium oxide was 906 t compared with 499 t in the previous year. In addition 1,380 t of FeNbTa alloy was produced, 110% more than the 655 t produced in 2002, and 990 t of FeNb alloy, 77% more than the 558 t produced in 2002.

Zinc

Zinc metal output rose in 2003 by 4% to 257,530 t. Cia Mineira de Metais (Votorantim group) produced 167,735 t (65% of the total) up 8.3% from 2002, mainly from domestic concentrates treated at the Tres Marias metallurgical plant. Output by Cia Paraibuna de Metais (Votorantim group) at the Juiz de Fora complex in Minas Gerais, fell by 2.3% to 89,795 t (35% of the Brazilian total) and was based exclusively on imported concentrates. From domestic sources, the production of zinc content in concentrate in 2003 was 143,396 t, compared with 136,339 t in 2002.

To meet primary domestic zinc demand of about 214,000 t/y, imports of zinc in all forms in 2003 totalled 27,542 t (US\$23.3 million), an increase in volume terms of 46% compared with 2002 and 37% higher by value. Zinc exports totalled 66,521 t (US\$54.9 million), hence the trade surplus was 43,072 t valued at US\$31.6 million. Imports of zinc concentrate, however, increased by 10% to 260,586 t worth US\$65.8 million, compared with 263,735 t worth US\$51.2 million in 2002.

Mineira de Metais continued with its US\$100 million expansion project 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 110,000 t/y to 160,000 t/y of zinc. Feasibility studies for a further expansion to 220,000 t/y have already begun and the expansion is planned to begin in 2004.

Phosphate

Brazil's production of phosphate concentrate rose by 9% in 2003 to an estimated 5.5 Mt of concentrate. Four companies account for about 94% of production: Fosfertil (Fertifos group) 34%, Bunge Fertilizantes 30%, Ultrafertil (Fertifos group) 15% and Copebras (Anglo American) 15%. Imports of phosphate concentrate increased by 4.6% to 1.1 Mt worth US\$50.1 million, compared with 1.05 Mt worth US\$48 million in 2002.

Fosfertil and its subsidiary, Ultrafertil, had, 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 October 2003, Bunge Fertilizantes acquired from CVRD all of its shares of 10.96% of the voting capital. Bunge is the principal Brazilian producer of phosphate and nitrate-based fertilizers. Phosphate is produced mainly from its mines at Tapira in Minas Gerais (Fosfertil) and Catalão in Goiás (Ultrafertil). In 2003, the Tapira mining complex produced 14 Mt of crude ore and the Catalão mining complex produced 6 Mt, and both produced a total of 2.7 Mt of phosphate concentrate. Fosfertil/Ultrafertil have embarked on a US\$90 million expansion plan to raise annual production of phosphate concentrate to about

3.2 Mt, with Catalão contributing 143,000 t, and Tapira 330,000 t to the expansion.

Bunge also has a mine at Araxá in Minas Gerais and one at Cajati in Sao Paulo. It is organised into two business units: fertilisers and animal-feed nutrients. Owing to the quality of the phosphate rock found at Cajati, 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 5.0 Mt of crude ore and Araxá produced 6.0 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 production is expected to be 4.8 Mt/y of crude ore.

Copebrás (Anglo American) produces around 20% of the total Brazilian production of phosphate concentrate, or some 1.2 Mt/y, from Catalão in Goiás. In March, 2003, Copebras inaugurated its new US\$104 million mining and chemical complex in Catalão to produce superphosphate. After a 20-year legal dispute with Fosfertil/Ultrafertil, Copebras has secured a concession for a new phosphate deposit located in Catalão, known as 'Area 5'. It has some 27 Mt of reserves and could expand Copebras' production of phosphate concentrate by 20% in the short term.

Brazil's demand for fertilisers reached a record 22.8 Mt in 2003, 19% more than in 2002. National production grew by 10% to 9.1 Mt, but the country continued to be dependent on imports, which rose by 40% to 14.7 Mt.

Kaolin

Brazilian kaolin production in 2003 rose by 23% to reach a record 2.16 Mt. Three companies account for 88% of production: Imerys – RCC (Imerys group 99.62%, Sumitomo 0.38%) produced 766,000 t; Caulim da Amazônia – CADAM (CVRD 61%, Banco do Brasil 22%, BNDES - Brazilian state development bank 17%) produced 711,000 t; and Para Pigmentos SA (CVRD 82%, Mitsubishi 18%) produced 423,000 t.

Imerys – RCC is expanding production to 850,000 t/y at a cost of about US\$16 million, Cadam has approved a new US\$30 million expansion project to increase production to 1 Mt/y and Para Pigmentos intends to start exporting its products to the US this year.

Oil

Agencia Nacional do Petroleo (ANP) staged its fifth auction of oil exploration permits during 2003 and the results were not so good as in the last auction. A total of only six oil companies participated in the bidding process for 908 blocks. Only 101 blocks were sold, of which 88 were with Petrobrás. Of the proceeds about US\$9.1 million or 80% were paid by Petrobrás. The blocks granted cover an area of 22,000 km², a little less than the 25,000 km² granted in the fourth round. The sixth round will be in August 2004, when blocks will be offered in 12 sedimentary basins.

In 2003, the average production of oil, liquid natural gas (LNG) and condensate rose by 2.7% to the equivalent of 1,540,000 bbl/d. The production of natural gas was of 39.83 Mm³/d, similar to 2002. This means that the average annual production will reach 1.79 Mbbbl/d of oil equivalent, representing a 2.2% increase compared with 2002.

With the acquisition of the Argentinean oil producer Perez Companc, 813 Mbbbl of oil equivalent were added to the reserves of Petrobrás under the criteria required by the Securities and Exchange Commission (SEC). With this acquisition, plus new discoveries in offshore Brazil and foreign countries, Petrobras' proven total reserves of oil, condensate and natural gas amounted to 12.6 billion barrels of oil equivalent at the end of 2003. As consequence, the Index of Replacement Reserves (IRR) was 356%, or an oil volume equivalent 3.56 times the volume produced in the year. In the same way, the relationship reserves/production ratio increased to 20.4 years, ranking Petrobras amongst the largest oil companies in the world.

At the end of December, the company's non-Brazilian production of oil, natural gas and condensate reached 246,000 bbl/d of oil equivalent to bring total production to 2,036,000 bbl/d of oil equivalent, placing Petrobrás in the select group of companies producing more than 2 Mbbbl/d.

Petrobras' domestic production goal of 1.9 Mbbbl/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 in 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 Mbbbl/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 of oil equivalent) compared with US\$3.26/boe in 2001. The reserves grew by 14.4% in 2003 to 12.6 billion boe.

On July 1, 2003, the Bolivia-Brazil gas pipeline reached its full capacity to transport 30 Mm³/d of natural gas, and the fiscal exemptions granted by the Brazilian and Bolivian Governments for the project were completed.

Tables following pages:

Mineral exports

Commodity	2002 ^r		2003 ^p	
	Volume	Value (US\$ million)	Volume	Value (US\$ million)
Metallic:				
Iron ore (Mt)	166.5	3,048.0	174.8	3,455.9
Bauxite (Mt)	3.37	90.9	4.7	121.0
Manganese (Mt)	0.90	41.3	1.06	45.6
Chromite (t)	22,828	1.7	32,000	6.4
Non-metallic				
Asbestos (t)	99,341	28.8	144,342	35.8
Kaolin (Mt)	1.44	161.7	1.85	205.2
Graphite (t)	12,778	11.8	13,291	12.3
Magnesite (t)	67,349	9.5	37,533	5.0
Dimension stone (Mt)	1.15	312.0	1.39	385.2
Semi-finished:				
Iron-steel (Mt)	11.68	2,928	12.98	3,860
Aluminium (Mt)	0.86	1,263	0.89	1,375
Tin (t)	6,065	22.38	3,655	16.22
Copper (t)	107,041	172.87	74,503	132.91
Silicon metal (t)	148,039	155.99	168,045	181.16
Nickel (t) ¹	25,059	103.70	21,095	122.53
Ferro manganese	146,647	63.27	162,635	73.82
Ferro chrome (t)	426	0.50	85	0.14
Ferro niobium (t)	31,257	268.03	30,953	259.0
Ferro nickel (t)	3,401	6,646	3,174	8,132
Ferro silicon (t)	103,819	72.16	106,494	76.42
Zinc (t)	59,695	47.40	66,521	54.90

Source: MME/SMM; SECEX-MDIC. ^r revised, ^p provisional

¹Except nickel content in ferro nickel.

Mineral production next page.

Mineral production

Commodity	2001 ^r	2002 ^r	2003 ^p
Iron ore (Mt)	210	239	219
Bauxite (Mt)	13.8	13.2	17.0
Coal ¹ (Mt)	5.64	5.14	4.64
Phosphate ² (Mt)	4.80	5.55	5.60
Manganese ² (Mt)	2.21	2.52	2.40
Copper ³ (t)	30,111	30,642	27,867
Tin ³ (t)	13,048	11,584	12,083
Chromium ⁴ (t)	299,502	280,000	383,000
Nickel ⁵ (t)	32,624	29,950	30,513
Niobium ³ (t)	24,864	24,174	25,000
Potassium ⁷ (t)	357,232	337,266	388,723
Zinc ³ (t)	111,432	136,339	145,396
Gold (kg)	53,200	38,058	38,000
Asbestos (t)	172,695	194,732	231,115
Kaolin ² (Mt)	1.81	1.76	2.16
Fluorite (t)	43,734	47,899	52,000
Gypsum (Mt)	1.50	1.63	1.80
Magnesite ² (t)	266,000	276,391	275,000
Natural gas (Mm ³)	14,045	15,568	15,792
Petroleum ('000 m ³)	75,224	84,440	86,827

Source: DNPM/DIRIM; SMM/MME.

^r revised; ^p provisional;

¹ Marketable Coal; ² concentrated or beneficiated; ³ metal content;

⁴ Cr₂O₃ content; ⁵ electrolytic nickel, metal content in ferro nickel alloy and in matte;

⁶ Nb₂O₅ content; ⁷ K₂O content.