

South America: land of plenty

South America is the world's fourth largest continent, with a total surface area of 17.9Mkm². It lies across the tropic of Capricorn and the equator and extends 7400km from the Caribbean Sea to the north to Cape Horn in the south. Its maximum width of 5160km is between Ponta do Seixas on Brazil's Atlantic coast to Punta Pariñas on Peru's Pacific coast. The continent is a prolific producer of iodine, bauxite, nitrates, potash, niobium and lithium among other commodities such as iron ore, copper and energy products.

South America's population more than doubled between 1960 and 2000, with an estimated 370m in 2007. Spanish is the official language of nine of the 13 countries in the continent. The official language of Brazil is Portuguese; English is the official language of Guyana; Dutch of Suriname; French of French Guiana; and both Guaraní and Spanish of Paraguay. Many Native American languages are also used; they are primarily Quecha, Aymara and Guaraní. The most important regional trade association is the Latin American Integration Association (LAIA), formerly known as the Latin American Free Trade Association (LAFTA).

Brazil and Venezuela are the dominant South American exporters, with the former accounting for much of the imports. Petroleum and other petroleum-related products are the principal components of foreign trade, with agricultural and mining commodities also of importance. South America has diverse resources, many of which have as yet been untapped. Although the mining

industry suffered in the late 1990s due to low gold and base metal prices, exploration spending was one of the world's largest. However, investments in Africa and Asia are now beginning to threaten this dominance.

Brazil is currently the world's largest seaborne iron ore supplier and Chile is the world's largest copper producer; while Brazil, Suriname, Venezuela and Guyana are no laggards in the bauxite sector. For industrial minerals, Chile is the world's premier iodine and nitrates producer; Brazil the top niobium producer; and Argentina a leading boron supplier.

With the current boom in mining investment, mergers and acquisitions have radically changed the list of South American players. Emblematic names such as Lac Minerals, MIM Metals, Cyprus, and Rio Algom have disappeared with their places now occupied by players such as Barrick Gold Corp, Goldcorp Inc and Xstrata plc, among others. Along the way, South America has produced some of its own giants such as

Below: Table highlighting primary industrial mineral output. Source: USGS, other.

	Bauxite (Mt)	Boron (000t)	Bentonite (000t) ^a	Diatomite (000t) ^a	Feldspar (000t)	Fluorspar (000t)	Fullers Earth (000t) ^a	Graphite (000t)	Iodine (000t)	Kaolin (000t) ^a	Kyanite (t)	Lime (000t)	Lithium (t)	Magnesite (000t)
Argentina		650	160	10	150	7	1.5			30			16,500 ^d	
Bolivia		60	0.55											
Brazil	21		227 ^b			66.5		75.6		2200	600	6900	12,100 ^e	350
Chile		460		30	6				15.5	15.2		453	43,600 ^f	
Colombia				4	100					8500 ^c		1300		10.5
Ecuador					40					5.9				
Guyana	1.5													
Paraguay										66 ^a		90 ^a		
Peru		10	18.5	35	6.5					2.7				
Suriname	4.8													
Uruguay					2.2									
Venezuela	5.9				200									

a-2005 figures, b-beneficiated, c-includes common clay, d-lithium carbonate and chloride, e-lithium concentrate, f-carbonate from subsurface brine, g-ferromanganese and silicomanganese, h-and related minerals, I-mineral concentrates: ilmenite and rutile, j-tantalum



Brazil's Cia Vale do Rio Doce (CVRD), which bought the Canadian nickel concern Inco Ltd last year for US\$18.7bn. It also incorporates the world's largest copper producer in Chile's state-owned Codelco and leading iodine and lithium producer in Sociedad Quimica y Minera de Chile SA (SQM).

Since the beginning of the mining boom, several radical and populist presidents have won office in their respective countries. This has seen uncertainty creep into the extractive industries, and in some cases renationalisation. Venezuela, under the leadership of President Hugo Chávez has threatened to reclaim its entire oil and gas industry, and has also increased the tax burden on many mining and mineral companies.

A Venezuelan-led group of South American countries plan to launch a new development bank for the continent in November 2007. The new entity will be called the Bank of the South. President Chávez came up with the concept as a way of creating an alternative to traditional international aid banks such as the International Monetary Fund and the World Bank. The bank will have initial capital of US\$7bn, which will come from the foreign reserves of all the member states. However, before the bank is launched, various issues need to be resolved, such as the capital contribution of each member state and the legal structure necessary for it to operate as an international organisation.

Argentina

Argentina, led by President Nestor Kirchner of the Justicialist Party, has sustained a robust economic recovery following the severe economic crisis in 2001/2002, with four consecutive years of over 8% growth in real gross domestic product. However, the country has not fulfilled its promise as a new mining and energy exploration frontier; as was the case in the 1990s. Despite favourable exchange rates, projects have been delayed due to the lack of governmental support. Moreover, the federal government has been unable to stand up to anti-mining forces currently emerging in the country. The two Patagonian provinces of Chubut and Río Negro, in open defiance of the Federal Mining Pact, have made *de facto* changes to mining laws that remain unchallenged. Furthermore, Mendoza province has also banned certain forms of mining. Still, the federal government continues to respect the 30-year tax stability granted to existing mines – the cornerstone of all current and future mining investment in Argentina. But new projects are distinctly less favourable.

Mining investments in Argentina have more than doubled from the US\$4bn invested between 1995-2005, to an estimated US\$5bn slated from 2006 to 2010. Two projects of note are Rio Tinto's Potasio Rio Colorado potash (PRC) project in Mendoza province and Admiralty Resources NL's giant Rincon lithium project.

Manganese (000t) ^{a,g}	Mica (t)	Niobium (000t)	Ammonia (000t)	Phosphate Rock (Mt)	Potash (000t)	Pumice (000t) ^h	Silica (000t) ^a	Soda Ash (000t) ^a	Talc (t)	Titanium (000t) ⁱ	Vermiculite (t)	Zirconium (000t)
5	4000		727			10	850	70	12,000		1300	
	4000								401,150			
1600		56 (0.26 ^j)	950	5.5	405		1600	200		138	30,000	35
					450	1620	300					
						640	43					
							25					
			5				900		20			
									1140			
50			1160	0.39 ^a			750					

Source: US Geological Survey

Right: Pilot operations. Even for its pilot operation, Potasio Rio Colorado has made significant investment in high quality equipment in order to ensure safe, reliable operation designed to avoid damage to the environment.



PRC may cost more than US\$900m and aims to produce 2.4Mt/y of potash within three to five years after commissioning in 2010. The potash will be extracted via in situ solution. Once operational, Argentina will become the largest potash producer in South America and the fifth largest in the world. It will transform Argentina into an important supplier to one of the world's main fertiliser markets: Brazil. As part of the project, Rio Tinto will build a US\$100m port facility at the coastal town of Bahia Blanca in Buenos Aires province. The complex will consist of a 200,000t storage facility, a conveyor belt and a new dock for loading ships. Rio Tinto may also build a secondary processing plant at the Bahia Blanca site to compact the potash from powder form to particles ready for soil application.

Australian-based Admiralty Resources' Rincon Salar project in Salta province in northern Argentina has estimated lithium metal reserves of 1.4Mt (after 75% recovery), and 50.8Mt of potash (at 70% of recovery). At planned production rates of 17,000t/y of various lithium products, reserves should last for about 400 years. The project is scheduled to reach full production by March 2009. The project lies at an altitude of 3740m and covers an area of 280km². Rincon is an endoheic basin, with no water escape.

Admiralty Resources also plans to buy a two-third stake in the 73.68km² Salar del Río Grande mineral resource area, 250km from Rincon, with the aim to supply sodium sulphate necessary to manufacture the lithium products. The Salar del Río Grande JORC-compliant resource estimate stands at 3.8Mt of recoverable anhydrous sodium sulphate. According to Admiralty, the sodium sulphate can be extracted and delivered to the company's Rincon plant for under US\$35/t. This represents an annual saving of US\$10.3m, as imported sodium sulphate can cost upwards of US\$250/t. In addition, the company will also supply the lime necessary for lithium production from its limestone assets in the country.

Other investments in Argentine industrial minerals include a US\$20m expansion of US-based Mosaic Co's fertiliser plant at San Martin port in Santa Fe, the acquisition of mortar and plaster producer Iggam by Saint Gobain, a US\$5.2m investment by German

building materials manufacturer Knauf into its gypsum wallboard plant in Mendoza province; and a US\$1m investment by Eurobor to build a 6000t/y plant to treat borate minerals in the San Antonio de los Cobres area of Salta province. Chinese influence and investment has also increased, with Argentine ambassador Zhang Tuo expressing an interest in financing new mining developments in Salta province. Salta currently provides China with boric acid, lithium chloride and colemanite.

Bolivia

The tenure of Bolivia's first indigenous president, the populist Evo Morales, began in January 2006. His time in office has brought uncertainty to the country's mining and energy industries due to his leftist rhetoric, controversial policy shifts and alliances with US foes: Venezuela and Iran. During his election campaign, he pledged to nationalise the energy sector – which he has done – and draw up a new constitution to empower the indigenous majority in the country. Recently, violence has gripped the nation as so-called rightist opposition clash with pro-government supporters.

Three multinational mining companies control almost 60% of Bolivian mineral exports: Swiss-based commodity trader and miner Glencore International AG, US-based gold producer Newmont Mining Corp and Canadian-based gold producer Orvana Minerals Corp. They generated US\$630m in 2006, lifting Bolivia's total mine exports to their highest in seven years, at US\$1.07bn.

With foreign mining investment at record levels in 2007, there are calls for Bolivia to clarify its mining policy, which has ranged from pro-business sentiment to announcements of full-out nationalisation. In May 2007, state-owned mining company Comibol was given control of the country's mineral reserves. The company said that it would honour existing mining concessions but return to the state unworked mining licences.

Bolivia's main mineral commodities are zinc and tin, followed by gold and silver. The country also has large reserves of antimony, cadmium, tungsten, bismuth, lead and copper. The most important industrial minerals are ulexite (boron compounds), amethyst and barite. According to the US Geological Survey, Bolivia produced 11,379t of barite, 590t of bentonite, 13,584t of boric acid, 1.4Mt of cement, 401,150t of crude talc and 62,604t of ulexite in 2005. Bolivia contains lithium reserves of 5.4Mt in the Salar de Uyuni saltpan, or nearly 50% of the global lithium metal reserve base, and an even higher percentage of lithium salt reserves. The deposit has been earmarked for development, with a number of companies expressing interest.

The country also hosts the giant El Mutun iron ore deposit, in which Indian steel producer Jindal Steel & Power holds a 50% interest. Jindal, which signed a contract with the Bolivian government in July 2007, has agreed to invest US\$2.1bn over the next 40 years. The 50km² Mutun deposit, near Bolivia's southeastern border with Brazil, contains an estimated 40bn tons of iron ore and 10bn tons of manganese. The Bolivian government wants to keep a share in the project but said



Left: Saler de Uyuni's vast lithium deposits have been earmarked for rapid exploitation.

it would welcome investments. Government coffers are expected to swell by US\$200m per year from El Mutun's iron ore output, and potentially more from manganese output. The government said it would invest US\$150m to provide rail and port infrastructure.

Bolivia is currently reviewing investment protection treaties with 24 countries with a view to renegotiate or terminate them. The move is the result of a dispute with Chilean company Quiborax following the cancellation of concessions at Salar de Uyuni in 2004. Quiborax had approached the World Bank's International Center for Settlement of Investment Disputes to arbitrate with the Bolivian government over its decision.

Brazil

President Luiz Inacio Lula da Silva, of the leftist Partido dos Trabalhadores, enjoys record levels of popularity and favourable economic conditions. But the government has yet to capitalise on its strong position to advance any ambitious reforms before political manoeuvring starts ahead of mid-term elections in late 2008. The main economic debate in Brazil over the past year has been whether to maintain strict controls on inflation or whether to stimulate economic growth and ease unemployment. Brazil's economy grew by 4.9% in the six months to 30 June 2007, from 3.7% for the whole of 2006. For the sixth consecutive year, the trade balance showed a surplus of US\$46.1bn in 2006, against US\$44.7bn in 2005. Industrial output growth of 2.8% in 2006 was outstripped by the mining sector, which grew by 7.3%.

Brazil's National Department of Mineral Production (DNPM) issued 12,871 exploration licences in 2006 and 437 mining authorisations, bringing the total issued to 3743 since 1988. The government collected US\$28m in fees for these licences, corresponding to an area of 388,000km².

Brazil contains extremely rich mineral reserves that are only partly exploited, including iron ore, tin, copper, pyrochlore (from which ferroniobium is derived), and bauxite. There are also significant amounts of granite, manganese, asbestos, gold, gemstones, quartz, tantalum, and kaolin (china clay), in which it is the world's second

largest producer of the paper-grade clay. Most minerals are concentrated in Minas Gerais and Pará, including iron ore, bauxite and gold. Mato Grosso and Amapá have most of the known manganese ore deposits, and kaolin is found mainly in the Amazon basin. Low-quality coal reserves are located in Rio Grande do Sul and Santa Catarina.

The main corporate development in its mining sector was CVRD's purchase of Inco Ltd - the world's second largest nickel producer - in January 2007. The total cost of the acquisition was almost US\$19bn and propelled CVRD to become the second largest diversified metals and mining company in the world. In 2006, Brazil's marketable iron ore production was estimated to have been about 350Mt, the world's largest outside of China. The value of iron ore exports grew by 23% whereas the value of Brazil's total exports grew by just 16%. Iron ore exports rose to 242Mt, worth US\$8.95bn, representing 6.5% of the total value of Brazilian exports of US\$137.5bn.

Brazil is also a leading bauxite producer. Marketable output grew by an estimated 3.3% in 2006, to 22Mt, and as a result of new projects, bauxite production could double by 2009. Mineração Rio do Norte accounted for 17.8Mt of bauxite production in 2006. Of the total tonnage, 13.6Mt was destined for the domestic market and 3.5Mt for export. CVRD has a 57% interest in Alunorte, which commissioned a new bauxite mine at Paragominas in the state of Pará in the March quarter of 2007. The mine will supply Alunorte's new refinery expansion with 5.4Mt/y of bauxite through a 244km slurry pipeline. A further expansion of Paragominas to 9.9Mt/y is planned by the June quarter of 2008. Meanwhile, in the far west of Pará, Alcoa is developing the Juruti bauxite project to produce 2.6Mt/y in 2008.

Brazil produced 6Mt of phosphate, 1.6Mt of manganese, 439,000t of potassium, 230,000t of asbestos, 2.6Mt of kaolin, 3Mt of gypsum and 350,000t of magnesite in 2006. Three companies accounted for 90% of kaolin production including French-based Imerys (1Mt), CVRD's 61%-owned Caulim da Amazônia SA (755,000t) and CVRD's 82%-owned Para Pigmentos SA (597,000t).

Below: Imerys' Rio Capim operation in Brazil.



Right: Atacama Minerals Corp commenced production from its Aguas Blancas iodine deposit in Chile's Atacama desert in 2001. The mine produces 125t/month.

As Brazilian kaolin is especially suited for coating applications because of its whiteness and opacity, Imerys, the world's largest producer of kaolin for paper application, is moving production from Cornwall, UK, to its Rio Capim operations. Its Cornish operations will only produce filler-grade kaolin for the paper industry. To facilitate the move, Imerys will expand its logistical capacity to transport its finished product into Europe with the addition of two Handymax vessels. Also, a new Euro85m mineral terminal is due to be completed in Antwerp to house slurry and dry products.

Three companies account for about 92% of Brazil's phosphate production including Fosfertil, which produced 2.87Mt in 2006; Bunge Fertilizantes, 1.5Mt; and Anglo American plc's 73%-owned subsidiary Copebrás, 1.17Mt. Brazil's demand for fertilisers in 2006 rose by 3.9% to 20.98Mt, and production increased by 2.9% to almost 9Mt. However, the country continued to depend on fertiliser imports, which rose by 11.5% to 12Mt. Imports of phosphate concentrate increased to 1.2Mt worth US\$57m. Compounding this has been the rise in prices from Belarusian and Russian potash producers. In September 2007, Belarusian Potash Co (BPC) raised its potash supply prices by US\$40/t to US\$305-315/t.

Meanwhile, Brazil's refractories sector has seen São Paulo-based private equity firm GP Investments take a controlling stake in Magnesita for US\$642m. Magnesita produces magnesite and talc, and is based in Brumado in Bahia state.

Chile

Chile is widely regarded as the most stable country in South America, despite its violent past. President Michelle Bachelet, of the centre-left Concertacion Democratica coalition, struggles with divisions and her reform agenda could well suffer as a result. Facing growing popular unrest as a result of problems she inherited and her own errors, she will face more serious governability issues than her three Concertacion predecessors.

Chile is the leading copper producer in the world, and in 2006 copper exports accounted for about 22% (US\$32bn) of the country's gross domestic product. Mining represented around two-thirds of the US\$55.9bn worth of total exports, and about a quarter of the US\$145.8bn GDP.

The major issues facing Chile's energy and minerals sectors are power generation and water scarcity. Some US\$3.6bn has been invested in natural gas distribution, a large portion of which is used for the generation of electricity. The supply of gas is principally sourced from Argentina, but this has been declining as the latter attempts to shore up its own energy shortages. Bolivia and Peru have large reserves of natural gas and are exporting, but historical political tensions are restraining trade with Chile. All this has prompted the Chilean government to focus on its strategic autonomy in energy. As a first step, the Ministry of Mines and Energy was split up into two separate departments in April 2007. But until solutions are developed, the supply of electricity is likely to be expensive and unreliable, certainly until 2010-2011.

Water shortages have brought the agricultural and extractive industries to loggerheads, forcing the government to implement new measures and directives to tighten its exploitation, particularly in the arid northern regions. It has also encouraged studies for the construction of desalination plants to pump water high up to



mining operations in the Andes.

Production of Chile's primary commodity, copper, increased only marginally in 2006, to 5.38Mt, from 5.33Mt a year earlier. This was largely due to a rock fall at state-owned Codelco's Chuquicamata mine, and a wage strike at the BHP Billiton-managed Escondida mine. Exploration spending was also dampened in 2006, prompting state mining agency Servicio Nacional de Geología y Minería (Sernageomin) to offer exploitation claims on the Internet, along with relevant exploration data.

The country produced a myriad of mineral products in 2006 including 387,000t of magnesite, 1112t of nitrates, 845,000t of gypsum, 1.6Mt of pumice and related minerals, 300,000t of silica sand, 460,000t of boron, 6000t of feldspar, 15,500t of iodine, 4581t of sodium chloride and 50,035t of lithium carbonate. In total, 39 minerals were produced accounting for US\$1.5bn in value, led by nitrates and iodine, according to state-owned geological survey Sernageomin in its 2006 mineral yearbook.

SQM, which made a net profit of US\$141m in 2006, plans to spend US\$14.4m to expand iodine production at its Nueva Victoria division in Chile's northernmost region (Region I). This should maintain output capacity at the present rate of 4500t/y. The company's principal shareholder, Pampa Calichera, has recently completed a US\$143m share purchase to increase its stake to 32%. SQM's other major shareholder is Canada's Potash Corporation of Saskatchewan, with 31%. Potash Corp has been trying to rest control of SQM from its largely Chilean investors over the past year. SQM has earmarked US\$600m over the next three years to boost capacity across all its operations. Meanwhile, nitrates and iodine producer Compañía de Salitre y Yodo de Chile has said it will spend US\$15m to expand iodine output from 1800t/y to 6000t/y at its plant in Region I.

Boric acid, ulexite and lithium carbonate were largely produced from brines extracted from underground deposits in the Atacama Salar. These brines contain reserves of lithium, potassium, boron and sulphates. Although Chile has other salars, most of the country's

production comes from the Atacama salt basin, which is controlled by SQM. Chilean data for clay production is unclear, but in 2005 the country reportedly produced 54,301t of plastic and other ball-type clays, 35,271t of bauxitic clays and 15,183t of kaolin.

Colombia

After his re-election in May 2006, President Alvaro Uribe should remain in power until 2010. Despite divisions within the ruling coalition, there should remain sufficient cohesion to avoid deterioration in governability. A negotiated end to the conflict with the Fuerzas Armadas Revolucionarias de Colombia (FARC) is unlikely. Notwithstanding improvements, public security will remain poor, particularly in some rural areas, and economic policymaking should remain prudent. GDP growth is forecast to slow, although at 6.8% in 2006, 6.6% in 2007, 5.8% projected in 2008 and 4.4% in 2009, it will remain well above Colombia's long-term average.



Colombia's exports, of which petroleum and coal were the two main earners, totalled US\$24.3bn in 2006. New security measures and increased drilling activity have slowed the decline in petroleum production, allowing Colombia to continue to export through 2010 or 2011, given current production estimates. It is presently the 16th-largest coal producing country in the world, accounting for about 1% of total annual production, and is the largest producer in Latin America (65.8Mt in 2006). Colombia has proven coal reserves of about 7.4bn short tons, the majority of which are located in the north of the country. Historically, Colombia is the world's leading producer of emeralds, although production has fallen in recent years. Emerald production fell from 116.3Mct in 2005 to 112.7Mct in 2006. Colombia is also a significant producer of gold, silver and platinum.

The minerals and mining sector should receive investment of at least US\$3.5bn in all areas of the industry between 2007 and 2010, the country's Inter-Organizational Mining Congress forecasts. However, this comes on the back of declining foreign direct investment in the minerals sector, which fell to US\$1.28bn in 2006, down

18% from 2005, although investments rose by 59% to US\$1.8bn in the oil sector from 2005.

The pace of mineral exploration, however, is still encouraging, with plenty of companies including Greystar Resources Ltd, AngloGold Ashanti Ltd and CVRD looking for economical deposits. CVRD is reportedly offering to invest US\$6bn in Colombia's Antioquia department to build an aluminium plant, a port terminal and a hydroelectric plant. In addition, French cement maker Lafarge plans to start operations in Colombia with the establishment of a joint venture to build a 15Mm² capacity cement panel production plant. According to the US Geological Survey, Colombia produced 700,000t of gypsum, 60,000t of asbestos, 8500t of bentonite, 8000t of clay and kaolin, 4000t of diatomite, 100,000t of feldspar, 10,500t of magnesite, 43,000t of phosphate rock in 2005.

Ecuador

Radical leftist President Rafael Correa took office in January 2007 for a four-year term, but fresh presidential and congressional elections could come as early as 2008. Despite rising opposition, Mr Correa appears sufficiently popular to secure a majority in the national assembly. Contrary to the government's pledges, a new constitution is unlikely to tackle deep-seated politicisation of institutions. Instead it is likely to serve as a vehicle to empower Mr Correa further. GDP growth is forecast to remain below 2% in 2008-09, owing to slowing exports and investment growth. Ecuador's estimated GDP for 2007 is US\$44.4bn, from US\$41.4bn in 2006. The Ecuadorian economy is based on petroleum production and agricultural production for domestic consumption and export. Principal exports are petroleum, bananas, shrimp, flowers and other primary agricultural products. In 2006, oil accounted for 59% of total export earnings. Ecuador is the world's largest exporter of bananas (about US\$1.2bn in 2006) and a major exporter of shrimp (US\$588m in 2006).

Despite the political uncertainty, Ecuador became one of South America's most prospective regions in 2006, following Aurelian Resources Inc's discovery of the giant Fruta del Norte epithermal gold deposit in the Cordillera del Condor. Elsewhere, Iamgold Corp continued to report very healthy intersections from its Quimsacocha epithermal gold project. A number of more advanced projects moved towards production, including International Minerals Corp's Rio Blanco epithermal gold project, and Corriente Resources Inc's Mirador copper porphyry. However, two junior exploration companies experienced extensive delays in their projects due to local unrest fuelled by empowered non-governmental organisations. Ecuador's primary industrial minerals sectors were feldspar, in which it produced 40,000t in 2006, and pumice and related minerals (640,000t). The country also hosts the rare clay mineral allophane.

Guyana

Legislative power rests in the unicameral National Assembly, with 40 members chosen on the basis of proportional representation from national lists named by

Left: Colombian emerald production is on the decline.

the political parties. Regional administrative districts elect an additional 25 members. The country is one of the poorest in South America, and is led by Executive President Bharrat Jagdeo. The stagnant mining sector recorded minimal growth in 2006, with bauxite export earnings rising slightly to US\$67m. Gold export earnings experienced a similar increase, reaching US\$114.4m in 2006, compared with US\$111m in 2005. However, the engineering and construction sectors recorded 12% growth in 2006, driven by new hotel construction in the build up to Guyana's hosting of the Cricket World Cup in March 2007. New housing projects also spurred the sector forward.

Bauxite mining has become a focal point for the country's economy, with Russian and Chinese involvement welcomed to overhaul the sector. Bauxite production amounted to 1.4Mt in 2005. In April 2007, Bosai Minerals Group Co Ltd of China, through its Guyanese majority-owned subsidiary Bosai Minerals Group Guyana Inc (formerly known as Omai Bauxite Mining Inc), awarded Great Lakes Minerals LLC the distribution rights for the 'refractory grade super calcined' bauxite to North American markets.

French Guiana and Suriname

French Guiana is an overseas department of France, located on the northern coast of South America. Like the

Right: Omai Bauxite plant in operation at the Lindon mine in Guyana.



other domiciles, French Guiana is one of the 26 regions of France, and as such is part of the European Union and trades in the Euro. French Guyana's main mineral industries are in cement, clays, columbite, tantalite, gold, silica sand and crushed stone.

Suriname is a democracy based on the 1987 constitution. The legislative branch of government consists of a 51-member unicameral National Assembly, simultaneously and popularly elected for a five-year term. The country is led by President Runaldo Ronald Venetiaan. Suriname's economy has been dominated by alumina, oil, and gold exports. Government income from the oil sector has recently surpassed that of the bauxite/alumina sector. Suriname's bauxite deposits are among the world's richest. Active in Suriname since 1916, Suralco, a subsidiary of US-based Alcoa Inc, has had a long-standing working relationship with Australian-owned BHP Billiton. After two years and an investment of approximately US\$130m, BHP Billiton officially commenced operations at the Kaaimangrasie and Klaverblad mines in 2006. These mines are expected to provide enough bauxite to cover the transition between the closing of the depleted Lelydorp mine, and the possible opening of

a mine in the Bakhuis area. Other proven reserves, sufficient to last until 2045, exist in the east, west, and north of the country. However, distance and topography make their immediate development costly. The government is currently in negotiations with Suralco and BHP Billiton over the exploitation rights for the Bakhuis region. Parties expect to have a new bauxite agreement signed by 2008, with the companies commencing activities in that region in either 2010 or 2011. Other active industrial minerals sectors in Suriname include quarried clays, sand and gravel and cement.

Paraguay

Paraguay is landlocked and has a predominantly agricultural economy, with a struggling commercial sector. Paraguay's highly centralised government, led by President Nicanor Duarte Frutos of the dominant Colorado Party, was fundamentally changed by the 1992 constitution, which provided for a division of powers. Presidential elections are scheduled for April 2008, where the popular leftist candidate Father Fernando Lugo hopes to overthrow the 'Reds' for the first time in 60 years.

Paraguay's GDP, based on purchasing power parity, was estimated at US\$28.3bn in 2005, up 5.6% on 2004. Mining has been restricted by limited exploration, inadequate infrastructure, large fiscal and trade deficits, scarcity of foreign exchange, and limited private investment, with little reforms to alleviate the country's economic stagnation.

Its main mineral industries are cement, iron and steel, and petroleum refinery products. Most deposits are found east of the Paraguay River. Manganese is located near Emboscada; malachite and azurite near Caapucú, Encarnación, and San Miguel; feldspar and mica near Concepción; and talc and piroflita near Caapucú and San Miguel. Ochre is found in the Cordillera region, and gypsum and limestone near the Paraguay River. Paraguay produced 550,000t of cement, 66,000t of kaolin, 90,000t of lime, 25,500t of sand in 2005.

Peru

Peru's economy has grown over the past five years, helped by market-orientated economic reforms and privatisations in the 1990s, and measures taken since 2001 to promote trade and attract investment. GDP grew 8.0% in 2006, from 6.7% in 2005, and is forecast to grow by more than 7% in 2007. President Alan Garcia has continued these policies to promote investment in construction, energy and mining. However, after a year into a five-year term, he is struggling to maintain public support for his administration, with his approval rating halving since he took office. Presidential authority will be constrained by the ruling party's minority position in the legislature.

Peru is a source of both natural gas and petroleum. In August 2004, Peru inaugurated operations of the Camisea natural gas project. Camisea gas is now fuelling an electricity generator and six industrial plants in Lima, with other facilities in the process of switching to gas. In a second phase, liquefied natural gas (LNG) will be exported to the west coast of the US and Mexico. The gas

and condensates from Camisea are equivalent to some 2.4bn bbl of oil, approximately seven times the size of Peru's proven oil reserves. The Camisea project, when completed, is expected to gradually transform Peru's economy, catalyse national development and turn Peru into a net energy exporter.

Many of the world's top mining companies have made big investments in Peru and are now ramping up output just when world prices for minerals are at record highs. The government has handed out concessions for exploration covering 120,000km², which it hopes will trigger further investment of US\$11bn over the next four years.

Peru is the world's second-largest producer of silver, sixth-largest producer of gold and copper, and a significant source of the world's zinc and lead. Mineral exports have consistently accounted for a large portion of Peru's export revenue, averaging around 50% of total earnings from 1998 to 2005 and 62% in 2006. The value of mine production increased by 14% to US\$14.8bn in 2006. The largest increases in production were in arsenic, selenium, bismuth and tellurium. Peru is the third-largest producer of arsenic, bismuth, silver, tin and zinc; and the fourth ranked producer of copper and lead. Peru also produces sulphur, phosphate rock, salt, gypsum, marble, limestone, barite, boron, diatomite, feldspar, kaolin, lime and silica sand. Peru's exports of non-metallic products, including ceramic products, security glass, marble and cement, rose in 2006 to reach an export value of US\$135m, up 14% on 2005. More than half the exports were to the US.

CVRD subsidiary Empresa Minera Regional Grau Bayóvar SA is developing the giant Bayóvar phosphate rock project in northern Peru. CVRD was handed the project in 2004, and expects to produce 3.3Mt/y of phosphate rock from 2010. Bayóvar comprises 1500km² of phosphate and brine and has proven reserves of 820Mt of phosphatic rock, equivalent to 260Mt of rock phosphate with 30% P₂O₅ content. CVRD won an international bid on 16 March 2005 to further explore the Bayóvar phosphate deposit.

Meanwhile, Peruvian cement companies Cementos Pacasmayo SAA and Juan Paulo Quay SAC were granted non-metalliferous mineral concessions in the Bayóvar area in August 2007. Cementos Pacasmayo will develop and operate chalk and diatomite deposits to produce cement and lime, and Juan Paulo will exploit gypsum deposits.

Uruguay

Uruguay's economy remains dependent on agriculture. Agriculture and the broader agri-industry account for 23% of GDP, and over two-thirds of total exports. In 2002, Uruguay went through a steep economic and financial crisis, which arose mostly from external factors. In 1999, devaluation in Brazil made Uruguayan goods less competitive and an outbreak of foot and mouth disease in 2001 curtailed beef exports to North America. Uruguay has since bounced back strongly, taking economic measures similar to Chile. In January 2007, the left-wing government of President Tabaré Vázquez signed a trade and investment 'framework agreement' with the US – a potential first step towards a free-trade deal.

Uruguay's industrial mineral industry includes clays, semi-precious gemstones, gold, iron and steel and aggregates. According to the USGS, the country produced 433t of amethyst, 3151kg of gold, 12,436t of iron ore, 1.13Mt of gypsum and 2150t of feldspar. The leading foreign player in Uruguay is Uruguay Mineral Exploration Inc, a gold producer and explorer for base metals and diamonds. The company produced 18,488oz of gold in the three months to 31 August 2007.

Venezuela

Having won a strong mandate in 2006, socialist President Hugo Chávez launched his third term with a drive to deepen '21st-century socialism'. Complete control of the legislature and significant influence over weak institutions should enable this, but obstacles remain. These include the gradual decline of fiscal revenue, which combined with a downturn in private investment, could produce an economic slowdown. The plan to abolish presidential term limits is part of a bundle of constitutional changes unveiled by Mr Chávez in August 2007; removing the last remaining checks on his presidential power.

Venezuela's economy recovered strongly after two consecutive years of deep economic recession between 2002-2003. The recovery has been driven by a large increase in government expenditures, based on an oil windfall, which in turn generated higher consumption levels. The country's natural resources are dominated by petroleum, and natural gas, which accounted for 15% of GDP in 2006. In 2005, Mr Chávez said he would cancel all mining concessions, but has instead launched sector reviews, which have caused serious project delays. In addition, plans are currently being drafted to force some foreign mining companies to form joint ventures with the Venezuelan administration.

The government's review into its mining sector also includes non-metallic minerals. In July 2007, the Monagas state administration started examining clay, sand and gravel operations to ensure they were meeting regulations. Venezuela produced 235,000t of common clays, 605,000t of sand and gravel, 200,000t of feldspar and 392,000t of phosphate rock in 2005, according to the USGS. The country also produces approximately 30,000t/y of abrasives (fused aluminium oxide and silicon carbide). The country has large mineral resources ranging from diamonds, coal and iron ore, to bauxite. About 6000Mt of iron ore are held in reserves; 550Mt of coal; and prolific bauxite reserves, which are exploited at CVG Bauxilum's 6Mt/y Los Pijiguaos mine. Bauxilum plans to boost alumina production to 2Mt/y in 2009, from 1.85Mt forecast in 2007.

Meanwhile, the government has demanded steel-maker Ternium Sidor to resume production from an idled rebar plant to supply lime to domestic customers. The latest demands are backed up with the threat of nationalisation. Venezuela has also proposed that Sidor start to sell lime produced at its facilities to reduce imports of the product in the local market. Currently, the lime is produced for Sidor's own consumption. 