Telecommunications Sector For Bolivia

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Key Statistics and Facts

General

Telecommunications revenue	415,157,344 (1999)
% of GDP	4.2% (1998)
Fixed-network growth	11.1% (1998-1999)
Cellular subscr. growth	75.7% (1998-1999)

Source: ITU (2000)

Industry Indicators

Main lines in service	502,483 (1999)
Main lines/100 pop	6.2 (1999)
Main line waiting time	1.6 Years (1996)
Main line capacity	653,661 (1999)
Digitalisation main lines	85% (1999)
Local loop	The local loop is provided for by Entel
Cellular subscriptions	420,344 (1999)
Cellular penetration	5.2% (1999)
Standards Cellular	AMPS
	AMPS - B
Human Resources	Number of employees: 4,393 (1998)
	Main lines/employee: 102 (1998)

Source: ^World Telecommunications Indicators, ITU (2000)

Industry Overview

Current Situation

The telecommunications sector is in preparation for the deregulation of the market in 2001. The former state-owned national telecommunications company, Entel, has a monopoly on long-distance telephony and the independent local co-operatives have exclusive rights to local telephony services, although this state of affairs will persist only until 2001, when all services will be opened up to local and foreign investment. The capitalisation of Entel, which involved the handing over of its management to the Italian company Stet-International Systems, is unique to the region, as is the co-operative system on this scale which governs local telephony provision and is based on the principle of common ownership.

There are only two mobile operators in the cellular market, one of which is controlled by Entel, with new operators authorised to enter the market in 2001. The most dynamic sector by far, it experienced an 82.5% growth rate between 1996-97, compared to a 20.6% growth rate for the fixed-line sector over the same period. The cable market is dominated by two private companies that after 2001 will be authorised to use their existing infrastructure to set up a range of new services in the data transmission and multimedia sectors. In the satellite sector, Entel is a signatory in the Intelsat consortium and the International telecommunications Union (ITU). The country is also on the Iridium coverage map.

The growth of telecommunications services and products has been above 8% for the past 10 years and is predicted to tally with the average growth of the industrial sector, at about 6%, over the next few years. Figures for total revenue reflect this trend with the sector generating US$154,788,560 in 1996, reaching US$209,021,184 by 1997. Digitalisation of main lines also increased considerably from 69% in 1996 to 81% in 1997, while overall teledensity levels rose less dramatically, from 5.6 main lines per 100 inhabitants in 1996 to 6.9 in 1997 (a figure which lags behind Latin American standards, and is left well behind North American and Western European levels of about 50).

Potential Growth

The principal areas for potential demand in the telecommunications sector are local telephone systems, long distance carriers, cellular telephony, television broadcasting, Personal Communications System (PCS), cable TV and data transmission. After the year 2001, the telecommunications sector will be opened up to local and foreign investors, which is likely to attract a large inflow of investments. For example, it is envisaged that the co-operatives that control the local telephony market will pursue alternative legal status, so that they can meet the requirements of the competitive market in 2002. This would inevitably include seeking out strategic partners and investors to raise their level of competitiveness, increase their access to the latest technologies and help with financing.

The growth prospects for 1999 are gloomy. Aggregate output growth slowed to 2% year on year in the first quarter of 1999, down from 4.8% in the same period last year. Mining production fell due to low international metal prices and hydrocarbon and construction output also dropped, with agriculture being the only sector of the economy to achieve positive growth, reaching a growth rate of 3% year on year in the first quarter of 1999. EIU forecasts for 1999 predict that there will be overall GDP growth of 3%, and 4% in 2000. This is provided that the agricultural sector (accounting for 15% of GDP in 1998) continues to show signs of recovery and that there is increased activity in the hydrocarbons sector, as natural gas exports to Brazil commence. A moderate recovery in demand for the country's other commodities exports and the continued growth of gross fixed investment as new hydrocarbons projects get underway, will fortify growth prospects in 2000. Essentially, the country's exports have been worsened by the lack of progress in other key areas, which underpin future growth. The government is behind schedule in the upgrading of the country's transport infrastructure, which is vital to attract new investment into the country. Also, the constraints of fiscal discipline limit the government's ability to boost demand in the face of difficult external conditions, while the Central Bank's steadfast determination to preserve the country's price stability diminishes the prospect that exporters might recoup some competitiveness 'through a faster rate of currency depreciation'. All in all, considering that the country relies so heavily on foreign savings, any downturn in foreign investor activity would certainly imperil overall growth prospects.

Fixed-line (Voice)

Market Organisation

Entel has a monopoly on long-distance telephony, with the independent local co-operatives having exclusive rights to local telephony services. However, this state of affairs is only temporary, given that after 2001, the telecommunications market will be opened up completely to local and foreign investments. Entel was formerly a state-owned national telecommunications company, until it was ‘capitalised’ on 25 September 1995, when its management was handed over to the Italian company Stet-International, in return for a pledged investment of US$610m.

Capitalisation is an important part of the government’s push to achieve macroeconomic stability, while increasing economic growth. The telecoms capitalisation was a unique experiment pioneered by the previous administration. Levels of foreign investment are an important part of this reform package. Essentially, the capitalisation of public enterprises is designed to improve levels of efficacy, while removing the government’s part in the production of goods and services. Companies in the capitalisation process are not fully privatised, but 50% of their assets are given to a partner, in return for an agreed investment, which should equal or surpass the value of the enterprise. The investment is therefore fully designed to provide for service expansion and/or introduce new technological innovation.

Stet’s winning bid ensured that it was ceded control of Entel, with a six-year monopoly to operate domestic and international long-distance telephone service in addition to all telex, telegraph and satellite services in the long-distance telephony market. There are also clauses in the capitalisation contract that stipulate that the company may lose rights to exclusivity, should it fail to fulfil various criteria, including commitment to its investment program. Investment by Entel in the last two years has been principally focused on the expansion of service into rural areas, the launching of a new cellular service, the improvement of interconnection with neighbouring countries, the laying of fibre-optic lines and the rolling out of new services.

In the local telephony market, there are 14 co-operatives (of which Comteco, Cotel and Cotas are the largest) and two companies (CBT and Entel) that provide services. The Telecommunications Law of 1995 granted the co-operatives six years of exclusivity in the local telephone market, although this exclusivity may be cut by 20% a year in the event that any co-operative should fall short of the performance obligations and service improvement targets that are stipulated by the law. The technology provided by the co-operatives is principally based on land lines, which are constructed in all main cities and in some adjacent areas. All the co-operatives are obliged by law to use Entel’s service for their national and international interconnection while Entel’s exclusivity remains. The 1995 Telecommunications Law forbids the use of call-back services.

An estimated 89% of all current local telephony technology is digital. By the end of 1999, it is expected that only five co-operatives will still be using analogue lines (still making up 11% of total lines). Growth in digital lines over 1997-1998 was some 31.7%, while the proportion of analogue lines decreased by 26.2%. In order for the co-operatives to upgrade to 100% digital switching, as required by the Telecommunications Law, it is envisaged that they will be required to invest some US$600m over the next three years. However, it is presently thought that only the co-operatives operating in La Paz, Cochabamba and Santa Cruz will easily secure funding for the project, while the others are likely to experience some difficulty in raising the necessary finances. All the local co-operatives must ‘accommodate the loss of their exclusivity within four years’, which may entail setting up associations with foreign investors. At the end of 1998, 557,522 local telephone lines had been installed, although only 447,439 were in operation - so only 80% of the installed capacity was being exploited.

The following table gives an indication of the expansion of lines installed by the largest three co-operatives in recent years:

Operator	1995	1996	1997
Comteco	52,860	66,280	87,671
Cotel	133,845	163,262	171,243
Cotas	87,035	106,828	126,558

Source: FECOTEL and Superintendency of Telecommunications

The co-operative system is rooted in the principle of common ownership of the service. By purchasing a 'telephone share', (equivalent to a telephone line), an interested individual becomes a member or part-owner of the co-operative. A telephone share typically costs around US$1,200, although after 2001, it is expected that the market prices for these shares will plummet. Some co-operatives have already taken action to acquire new legal status, one notable example being the La Paz co-operative (Cotel), which was restructured by the government, in order to attract new investments and build links with other international and local telephone companies.

At the beginning of July 2000, telephone co-operatives Cotes, Cotel, Cotas and Comteco signed a memorandum of understanding to create a national long-distance operator to compete with Entel Bolivia, after market deregulation on 28 November 2001. Once the division of ownership in the company is clarified, the telcos will bring in a strategic partner. The new operator will provide internet, mobile telephony, long-distance and data transmission services. Local telephony will remain under the control of individual co-operatives. The founding co-operatives have earmarked US$40m for investment in the construction of a fibre-optic backbone, linking the larger co-operatives in western parts of the country, with satellite gateways linking smaller companies in the cities of Trinidad, Cobija, Riberalta and Guayaramerin. Potential investors are being sought in the US and Japan.

Leading Players

- **Entel Bolivia**

  Entel (Empresa Nacional de Telecomunicaciones) was state owned until its 'capitalisation' on 28 September 1995, when 50% of its assets were sold to Italy's Stet-international in return for investment. In its winning bid, Stet-International pledged to invest some US$610m. The Italian telco retains control over Entel. It has a six-year monopoly to operate the domestic and international long-distance services, in addition to all telex, telegraph and satellite services, which are linked to long-distance telephony.

  Long-distance telephony is completely provided by Entel. The company's contract for long-distance service encompasses domestic and international long-distance services, has a duration period of 40 years and an exclusivity period of six years. The main commitments associated with the company's concession contract are to install 5,000 public telephones, roll out services to 1,099 new rural towns (with more than 350 inhabitants) and to integrate the public networks of other operators. All in all, Entel has rights to provide services in all sectors of the telecommunications industry.

  The company is the country's main purchaser of telecommunications equipment, in which it has pledged to invest over US$1.2bn over the next seven years.

  Bolivia has more than 2,500km of fibre-optic network, connecting the main cities (i.e. La Paz, Oruro, Cochabamba, Santa Cruz, Potosí, Sucre, and Tarija) and the neighbouring countries, (i.e. Argentina, Chile and Peru.) Entel hopes that the country will become the hub of telecommunications in South America, once it finishes connection of the network to Brazil in 2000. Tarija will be connected to Santa Cruz, and Santa Cruz to Puerto Suarez, on the Brazilian frontier. More than 750 small rural towns are serviced by 3,504 telephone lines, with the network expected to reach 1,009 small towns, with a total of 6,011 lines, by 2002. The public telephone network comprises 5,015 new public telephones. Internet subscriptions are up around the 10,000 mark.

  In addition to the fibre-optic network, there are other systems providing national and international services. These include the microwave digital network, satellite communications and submarine cable network. The cities of La Paz, Cochabamba and Santa Cruz are interconnected by a main line containing 1,920 microwave channels, which supports the fibre-optic network. While the fibre-optic network is being constructed between Bolivia and Brazil, Santa Cruz and Puerto Suarez are connected via digital radio link. International communications are also relayed via satellite, with two ground stations, Tiwanaku in La Paz and La Guardia in Santa Cruz de la Sierra. The satellite network is made up of 30 domestic satellite stations and more than 100 Very Small Aperture Stations (VSAT) stations, providing coverage to the main intermediate cities and rural towns located in the Bolivian Amazon region, and in other inaccessible areas. Meanwhile, submarine cable will gradually replace many long-distance services, provided by satellite. The submarine cable originates in Chile, linking up with all the Pacific coast countries in the region and the US, ending in Asia.

Entel's Progress Report

	Until 1995	First six months of 1999
Mobile Telephony	Non-existent	More than 170,000 users, since beginning of operations in November 1996
Public Telephony	342	5,015
Long Distance Telephony	163,000 users	Approximately 400,000
Local Telephony	5,700 users	Approximately 17,000
Internet	Non-existent	Available in the 9 departmental capitals, and in middle-sized towns
Video Conferencing	Non-existent	Available in 8 of the 9 departmental capitals
Fibre-Optic Network	Non-existent	Approximately 2,500km
Telephone Coverage	355 towns	Around 850 towns with population exceeding 350 inhabitants
Business VSAT	Non-existent	22 Antennae

Over the next five years, Entel is expected to invest some US$890m, with special emphasis on voice, data, image and satellite services. Investments beyond the exclusivity period through 2005 are predicted to be in the region of US$334m, targeting improvements to, or creation of a national commutation network, a national transmission network, the international network, a mobile satellite system and a cellular service based on Iridium's stationary satellite system.

Entel announced in mid-July 2000 that it is to abolish charges for line installations, after market deregulation in November 2001. The announcement came just a day after the country's four largest local telephony co-operatives signed a MoU to invest US$300m in a new long-distance carrier to compete with Entel (see **Fixed-line**).

A report in mid-2000 by industry regulator Sittel, charged Entel with failing to meet the rural coverage goals outlined in its privatisation contract. According to the study, Entel has not yet met 30% of its coverage goals in rural areas - as set out in 1999 - and many of the installed telephones do not function properly. Although these claims were rejected by Entel, which maintains that it has surpassed coverage requirements, the operator's plans to invest outside the country are now at risk. Under the terms of the contract, Entel is required to install 1,099 public telephones in villages with more than 350 residents, at an annual rate of 275 telephones until November 2001, when the telecom market will be deregulated. However, Entel is claiming that it installed 285 telephones last year and previously revealed that it would expand operations into Mercosur trading nations Brazil, Argentina, Paraguay and Uruguay.

- **Cotel (La Paz Telephone Co-operative)**

  Cotel has the exclusive right to provide local telephone services in La Paz until 2001, when the telecommunications sector is deregulated and fully opened up to competition. All subscribers to the service are members of the company.

  According to March 1998 figures, the company - the largest of all the telephone co-operatives - operated some 172,000 lines, of which 66,500 were analogue and 105,500 were digital. The company currently has 170,000 members and is indebted by an estimated US$80m.

  On 12 July 1999, the company received bids from companies with an interest in joining the company to develop Cotel's infrastructure in preparation for the company's entry into a deregulated market in 2001. Five companies bought bidding rules, Bolivia's Entel, Sweden's Telia, Spain's Union Fenosa, Santa Cruz-based telephone co-operative Cotas and domestic mobile operator Telecel. Bids were set at a minimum of US$1,500, which would establish a minimum investment of around US$255m in the company. However, the company abandoned its search for a strategic partner after Telia and Entel both pulled out of the deal. Telia stated that it was unable to apply because of its own financial situation, the small size of Cotel and the fact that its proposal did not meet with one of the main requirements of the deal, which was to guarantee the return of shares to proprietors. Entel pulled out of the tender, blaming the excessively high demands of the government-set conditions.

- **Cotas (Santa Cruz Telephone Co-operative)**

  Cotas has exclusivity in the provision of local telephone services in Santa Cruz until 2001, when the telecommunications sector is deregulated and fully opened up to competition. All subscribers to the service are members of the company.

  According to March 1998 figures, the company operated 126,488 lines, of which 3,310 were analogue and 123,178 were digital. It is the second largest of the co-operatives.

  In December 1998, the company announced that it had struck a deal with Newbridge Networks to construct an Asynchronous Transfer Mode (ATM) multi-services network, the first of its kind in South America. The company is aiming to use the ATM network to support its voice traffic, which will increase its market competitiveness prior to market deregulation in 2001, potentially increasing service from the current 10 lines per 100 inhabitants to 16 lines by 2000.

- **Comteco (Cochabamba Telephone Co-operative)**

  Comteco was set up in 1985 and has exclusivity in the provision of local telephone services in Cochabamba, through contracts agreed between the Superintendency of Telecommunications and Comteco Ltd, until 2001 when the telecommunications sector is deregulated. All subscribers to the service are members of the company. It is the third largest of the local telephone co-operatives.

  According to 1997 figures, the company has invested some US$33m in its telephony service. One of the most important highlights of the investment programme was the Gran Centro project to install a modern fibre-optic network in the centre of the city, with an installation capacity to meet the needs of the community until at least 2010. Another important project was the introduction of wireless telephony.

  The range of services that the company provides includes a fibre-optic network, direct line, data transmission facility, wireless telephony and Centrex service geared towards business clientele. According to March 1998 figures, the company operated 87,671 lines, of which 13,100 were analogue and 74,471 were digital.

In mid-July 2000, Comteco announced plans to introduce international long-distance calling rates of 0.92 bolivianos or US$0.15 per minute during peak hours, compared to 5 bolivianos or US$0.81 charged by the dominant long-distance carrier Entel. Comteco also aims to charge 4 bolivianos or US$0.65 per minute off-peak to any country in the Andean bloc and the US. Comteco has attributed the high cost of long-distance calls to Entel's monopoly position within the market and urged immediate deregulation to bring down prices. Deregulation of the market is not slated to take place until 11 November 2001.

Cable Communications

Market Organisation

Following the amalgamation of two of the principal TV cable companies into Multivision-Plus, there are only two main private cable companies in operation, Multivision and Supercanal. Multivision operates on a codified Ultra High Frequency (UHF) system, offering coverage in La Paz, Cochabamba, Santa Cruz, Tarija and Sucre. Supercanal is an Argentine consortium that only provides coverage in La Paz and Cochabamba, via modern fibre-optic technology.

Once Entel has fully installed a fibre-optic network, the company will set up a nationwide cable TV service, either alone or in association with the existing providers. Importantly, at the end of 2001 all the cable TV companies will be given the opportunity to use their existing infrastructure to provide internet, computerised telephony and data transmission services. Companies wishing to move in this direction will be required to obtain a concession.

Leading Players

- **Multivision**

  Multivision is one of two major private cable TV systems in the country and is a subsidiary of Multivision Communications Corp. of Canada. It holds national licences for both the delivery of over-the-air (MMDS) and cable TV (hardwire) services. It operates on a codified UHF (Ultra High Frequency) system, providing services in La Paz, Cochabamba, Santa Cruz, Tarija and Sucre. It is the country’s largest provider of pay TV services.

  The company operates MMDS systems (microwave multiple distribution system) in the cities of La Paz, Santa Cruz, Cochabamba and Sucre, and was the first cable company world-wide to deliver 60 channels of pay-TV to its subscribers. The company’s MMDS systems also provides pay per view services. Since the purchase of the four Bolivian operating pay-TV systems in La Paz, Cochabamba, Santa Cruz and Sucre in 1996, the company has consolidated growth. Pay-TV outlets increased from 9,000 in April 1996 to 28,000 outlets in May 1997. Once Entel has fully installed its fibre-optic network, it will inaugurate a cable TV service nation-wide, either solely or in association with the existing providers - which would expand Multivision’s services. At the end of 2001, Multivision will have the opportunity to use its installed infrastructure to provide internet, computerised telephony and data transmission services, for which it must first obtain a concession.

- **Supercanal**

  Supercanal is the other only major provider of cable TV in the country. It is an Argentine consortium that covers La Paz and Cochbamba and provides services through fibre-optic. Once Entel has fully installed its fibre-optic network, it will inaugurate a cable TV service nation-wide, either solely or in association with the existing providers - which would no doubt expand Supercanal’s existing services.

At the end of 2001, Supercanal like Multivision will have the opportunity to use installed infrastructure to provide internet, computerised telephony and data transmission services, for which it must also of course obtain a concession.

Mobile

Cellular

Market Organisation

There are two companies that provide cellular services, Telecel and Entel-Movil, each controlling 36% and 64% of the market respectively.

Until 1996, Telecel was the only provider of cellular services, operating band 'A' in 850 MHz. Entel-Movil was authorised to enter the market in August 1996, and operates band 'B' of the network in 850 MHz. As a result of Entel-Movil's entrance into the market, and the ensuing price drop, the cellular market was broadened, which led to a large number of consumers being able to access the market. The growth figures for 1996-1997 reflect this trend - there was an 82.5% rise in subscriber numbers.

According to 1998 figures, some US$250m has been invested in cellular services since 1990 in establishing the new market for cellular services. Telecel has invested approximately US$50m in the promotion and installation of cellular phones, which the company estimates has attracted some 75,000 subscribers. Entel on the other hand had invested around US$200m, which according to 1998 figures had drawn some 120,000 users. Disputes between the two companies have been well documented, especially with regard to Telecel's accusations that Entel used illegal cross-subsidies from its monopoly in the long-distance/international telephony sector to push its competitor out of business. The accusations are based on the fact that only a small percentage of Entel's subscribers actually pay for the service - allegedly half of the company's accounts have been left unpaid for several months.

Setting up bids to put a Personal Communications System (PCS) into operation has been on the government's agenda for some time. Currently, the government has three bands available ranging from 1.8 to 2.1 GHz, one of which has been allotted to Entel, although it is not yet up and running. In November 1999, it was announced that Nuevatel PCS, a group led by US-based Western Wireless Corp. had won a tender to operate a PCS phone system. The deal was said to be worth US$15.3m; the group - 51% controlled by Western Wireless with the country's co-operative COMTECO as a partner - was the sole bidder for the 20-year concession. This sparked controversy, with Entel launching a court action to protest against what it saw as an infringement of its monopoly rights, but the action was dismissed in February 2000. Nuevatel planned to invest between US$50-100m in order to have the system up and running within nine months. The service will compete with existing cellular services. At the moment, two telephone co-operatives, Comteco (Cochabamba) and Cotas (Santa Cruz) are offering fixed wireless telephony in the range 1.910 to 1.930 MHz with Entel, which, although not strictly a PCS system, is very similar in theory.

Leading Players

- ***Entel-Movil***

  Entel-Movil entered the market on 8 November 1996. It enjoys a 64% market share. The company is part of Entel. It operates band 'B' in 850 MHz. Entel-Movil immediately moved aggressively to expand across the market, claiming 120,000 subscribers by the end of 1998. The use of digital technology allowed Entel-Movil to obtain additional advantages over the analogue system used by its competitor Telecel. The company has receives backing from TIM (Telecom Italia Mobile), one of the largest mobile companies in Europe.

Entel-Movil provides coverage for the following areas: La Paz, Cochabamba, Santa Cruz, Tarija, Sucre, Beni, Potosí, Oruro and Pando. New coverage areas include Tiahuanacu and Achacachi in La Paz department, Chapare in Cochbamba department, Yotala and Villazón in Sucre department, Tupiza in Potosí department and Bermejo in Tarija department.

The company exclusively uses Ericsson (**www.ericsson.com**), Nokia (**www.nokia.com**) and Motorola (**www.motorola.com**) technology.

- **Telecel**

  Telecel began services on 15 November 1991 in La Paz, Santa Cruz and, from 2 April 1992, in Cochabamba. According to 1998 figures, the company had gained a 36% share of the market, attracting some 75,000 subscribers to its service. The company is interconnected to the exchanges of the telephone co-operatives in the cities of La Paz (Cotel), Cochabamba (Comteco) and Santa Cruz (Cotas) as well as to the domestic and international long-distance network of Entel. The company was the only provider of cellular services until 1996, and is a joint venture between domestic investors and MIC, a partner of US company Millicom International. In 1990, the government granted Millicom a 40-year contract, renewable on a discretionary basis every 6 years, for the operation of cellular services in the La Paz, Santa Cruz and Cochabamba departments. It operates band 'A' in 850 MHz and uses mainly Motorola equipment (**www.motorola.com**).

  At the end of 1997, Telecel endeavoured to install a fixed-wireless telephone system in the La Paz area. The level of its preliminary investments allowed the company to provide modern fixed wireless access technology for telephone services, including data and fax transmission, high-speed internet access, conference calls, voice mail, virtual telephone and image transmission, for which Nortel provided the equipment. However, disputes ensued over the company's 'right' to provide the service, which led to Telecel's failure to gain interconnection with Cotel (the co-operative which provides local telephone service in La Paz) and to the suspension of the project. The go-ahead for the project depends on a suitable legal solution being found. Telecel plans to invest an additional US$70m to expand its fixed-wireless service in the three major urban areas.

- **Nuevatel PCS**

  Nuevatel PCS de Bolivia was formed by Western Wireless International Corporation (WWIC) and Cooperativa Mixta de Telecomunicaciones Cochabamba (COMTECO) in 1999 to deliver Personal Communications Systems (PCS). At the end of May 2000, Nuevatel granted Nokia a US$25m contract to provide a GSM 1900 network. Under the terms of the agreement, Nokia will provide a complete network including switching, base station systems and radio transmission equipment to Nuevatel. Nokia will also provide its Artus Messaging Platform and a WAP (wireless application protocol) gateway system. The new network is the country's first GSM 1900 network. In the first phase of operations, the network will be available in the capital La Paz, Cochabamba and Santa Cruz, before being made available nationwide. Nuevatel expects operations to commence in the second quarter of 2000.

Satellite

Market Organisation

Entel is a signatory in the Intelsat consortium (**www.intelsat.com**) with a 0.255617, stake and is also on the Iridium coverage map (**www.iridium.com**).

International communications are also relayed via satellite, with two ground stations, Tiwanaku in La Paz and La Guardia in Santa Cruz de la Sierra. The satellite network is made up of 30 domestic satellite stations and more than 100 Very Small Aperture (VSAT) stations, which provide coverage to the main intermediate cities and rural towns located in the Bolivian Amazon region, and in other inaccessible areas.

In mid-March 1999, Orbcomm Global LP's (**www.orbcomm.com**) service licensee, Damos SudAmerica, launched its commercial data and messaging service in South America. Damos will sell Orbcomm's satellite communications services in Bolivia.

Leading Players

- **Entel**

On 7 May 1999, STM Wireless Inc announced that it had won a US$5.4m contract from Entel to supply 550 solar-powered Subscriber Earth Station (SES) 'space phone' terminals. The terminals will be installed to fulfil Entel's Universal Service Obligation (USO). More than half of the sites are expected to be in operation by the end of 1999. STM's satellite technology will prove a quicker and more cost effective option for its USO than the terrestrial radio technologies that Entel has used in the past. The move is designed to improve the country's telephone penetration levels in remote rural areas that are currently under-served.

Data

Fixed-line

Market Organisation

In addition to Entel, there are two data transmission companies that provide the Intelsat Business service (IBS), Teledata and Datacom. The two companies were the only providers of long-distance data transmission when the new 1995 Telecommunications Law was passed, and their ongoing service was provided for under the Law. The companies may continue to operate and expand their services provided that their combined gross incomes do not surpass 4% (i.e. 2% for each company) of Entel's long distance revenues. There are four other internet providers, operating through Entel's internet connections: Bolnet, Digital World Service, Megalink and Skynet SRL.

Leading Players

In addition to **Entel**, two data transmission companies provide the IBS (Intelsat Business Service) system: **Teledata** and **Datacom** - partly owned by a Chilean company publicly traded in the New York Stock Exchange. These two companies were the only providers of long-distance data transmission when the new 1995 Telecommunications Law was passed, and their continued service was provided for under the law. They can continue in operation and expand their services provided that their combined revenues do not exceed 4% (2% for each company) of Entel's long-distance revenues.

- **Cotas (Santa Cruz Telephone Co-operative)**

  At the beginning of December 1998, Cotas signed a deal with Newbridge Networks to construct an Asynchronous Transfer Mode (ATM) multi-services network. The network is designed to provide Cotas's customers with value-added voice and data services in Santa Cruz, including internet access, e-mail, electronic file exchange and e-commerce. The network, offering frame relay, Time Division Multiplexing (TDM) and Local Area Network (LAN) interconnection, will support surging customer demand for high quality, bandwidth-intensive data services. The deal should ensure that Cotas is identified as the market leader in network services.

Wireless

Cellular - 2.5G and 3G

Leading Players

- **Telecel**

  In October 1999, Millicom signed a deal with Ericsson to upgrade Telecel's AMPS technology to TDMA. This, it is envisaged, will allow for added subscribers without the need for additional frequency spectrum, as well as for third generation (3G) services.

- **Nuevatel**

  At the end of June 2000, Logica of the US announced a new multi-million dollar contract with Nuevatel. Logica will support Nuevatel in the design, construction and maintenance of its PCS (GSM 1900) network. The deal will ensure not only the development of Nuevatel's current PCS capabilities, but will aid any future plans to launch a 3G network, which will offer next generation wireless services such as WAP, GPRS and UMTS.

Internet

Leading Players

Aside from **Entel**, there are also four other Internet Service Providers that operate through Entel's internet connections: **Bolnet, Digital World Service, MegaLink** and **SkyNet SRL**.

Equipment

Equipment Imports by Country of Origin (1998)

Country	US$	% Total
US	29,187,748	28.3
Brazil	28,030,879	27.1
Sweden	11,354,717	11.0
Italy	7,466,577	7.2
Canada	5,039,218	4.9
Germany	4,544,617	4.4
Argentina	4,089,565	4.0
Japan	837,970	0.8
Other	12,689,815	12.3
Total	**103,251,106**	**100**

Source: Instituto Nacional de Estadistica (INE)

Leading Players

- **AT&T**
- **Nortel**
- **Motorola**
- **Scientific Atlanta**
- **Siemens**

- **Alcatel**
- **OKI**
- **Ericsson**
- **Italtel**

Regulatory Environment

The Superintendency of Telecommunications is part of the Sirese system, an autonomous government agency which is charged with providing regulatory oversight of the five basic utility sectors: Telecommunications, Electricity, Transport, Hydrocarbons and Potable Water). Sirese carries out the basic regulatory functions, including the granting of licences and concessions, the setting of some rates and the supervision of monopolistic practices in the telecommunications sector. The five Sirese superintendents (i.e one for each sector) are also responsible for ensuring that the capitalised companies carry out their contractual obligations.

Telecommunications policy is devised by the Executive Branch, through the office of the Vice Minister of Transportation, Communications and Civil aviation, within the Ministry of Economic Development. Sirese's superintendent of telecommunications is responsible for applying the 1995 Telecommunications Law and other decrees and regulations, worked out by the Vice Minister's office.

Government Strategy

All telecommunications services that do not fall into the long-distance, international and local basic telephone services categories are open to market competition, the most successful example being the cellular sector. By 2002, all services within the telecommunications market will be open to competition, without exception. This will increase competition in the sector and invite foreign and domestic operators to compete equally. It should also bring down costs and increase the overall efficiency of the sectors.

In the government's overall approach to the telecommunications market, capitalisation plays an important role. A unique experiment pioneered by the previous administration, it is designed to aid macroeconomic stability, while increasing economic growth. The capitalisation of public enterprises (such as the fixed-line monopoly Entel) is designed to improve levels of efficacy, while removing the government's part in the production of goods and services. Companies in the capitalisation process are not fully privatised, but 50% of their assets are given to a partner in return for an agreed investment, which should equal or surpass the value of the enterprise. The investment is therefore fully designed to provide for service expansion and/or introduce new technological innovation.

Another successful strategy that the government has employed is the co-operative system, which is rooted in the principle of common ownership of the service. An interested individual becomes a member or part owner of the co-operative, by purchasing a 'telephone share' (equivalent to a telephone line). However, after 2001, it is expected that the market prices for these telephone shares will plummet, forcing co-operatives to take action to acquire new legal status. Already the La Paz co-operative (Cotel) has been restructured by the government, in order to attract new investments and build links with other international and local telephone companies.

Important Regulations

The new Telecommunications Law was passed by the government on 6 July 1995. The law has the following functions:

- To establish the role of the telecommunications superintendency
- To require service suppliers to interconnect all public networks
- Set the rate-setting procedures for telecommunications services
- Provide a market share guarantee for existing private data transmission companies

- Set the 6 year exclusivity period for Entel, which began in September 1995, and a similar period of exclusivity for the existing local service telephone co-operatives
- Place a ban on all wiretaps (except in the case of a judicial order)
- Set restrictions on the use of call back services

Industry Organisations

Federación de Co-operativas Telefónicas de Bolivia (Federation of Telephone Co-operatives of Bolivia FECOTEL)
Av. 16 de Julio 1566, Piso 8, Casilla 3978
La Paz
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International Organisations

- *World Trade Organisation (WTO)*

- *Inter-American Telecommunications Commission (CITEL)*

  CITEL is an entity of the Organisation of American States (OAS) responsible for facilitating the development of telecommunications in Latin America.

- *Asociación de Empresas de Telecomunicaciones de la Comunidad Andina (ASETA)*
  http://www.aseta.org.ec

  ASETA was formed by the Andean Community (Colombia, Bolivia, Peru, Ecuador, and Venezuela) in order to facilitate the development and integration of telecommunications services between member countries.

- *ITU*
  http://www.itu.com

  Bolivia is a signatory to the ITU.

Foreign Investment

Overview

The import of hi-tech telecommunications equipment and materials is very important given that there is no domestic production, except for minor electrical components used in the computing industry. Total imports of telecommunications equipment reached US$103m in 1998. Growth of the equipment industry has been over 10% over the last ten years and is expected to maintain similar levels in the near future. Equipment trade supply, while dominated by US imports, is also heavily dependent on equipment from other countries, principally Brazil, Sweden and Italy. Bolivia's policy of open market access should ensure that foreign equipment suppliers from other countries are also attracted to invest money in the telecommunications sector. However, given that the US has dominated the equipment market for the last two years, Stet-International's investments in Entel should provide a multi-million dollar market particularly for US suppliers, while its period of exclusivity endures.

The greatest potential for investment lies with the investment requirements of Entel and with the independent local co-operatives - although after the year 2001, the majority of telecommunications products and services should have very high demand. 2001 marks the end of the period of monopoly in the sector. Post-2001, the telecommunications market will be completely open to local and foreign investment, with considerable growth predicted for the following years.

Structural Factors

With an open market economy in Bolivia, foreign investors already enjoy no major restrictions on foreign ownership or investment and are treated the same as domestic investors. 100% foreign ownership is allowed and there are no requirements that stipulate the need to register. The country also grants free currency conversion, unrestricted remittances and international arbitration. There is no special treatment in place for the repatriation of profits. Foreign companies are taxed at the same level as domestic companies, with a 25% assessor placed on profits declared at the end of the year. The country has a simple and low tariff regime in comparison to other countries in the region. Telecommunications imports are taxed at 10%. All imports are subject to a number of additional fees and taxes, which can add up to an extra 15-35% being added to the basic tariffs.

Level of Foreign Investment

There is a notable foreign investment in the Bolivian telecommunications sector, particularly in equipment provision. Major foreign players include:

- *Fixed line:* Stet-International
- *Cellular:* TIM (Telecom Italia Mobile) and MIC (partner of Milicom International)
- *Cable:* Multivision Communications Corp.
- *Equipment:* Ericsson, Nokia and Motorola

Outlook

Trends

- The telecommunications sector is in preparation for the deregulation of the market in 2001, which is the key date for its full development.
- In the short-term, the market is likely to be driven by the cellular sector, with bids for a Personal Communications System (PCS) set up by the government some time in the near future.
- In the fixed-line sector development is expected to be principally focused on the expansion of service into rural areas, the improvement of interconnection with neighbouring countries, the laying of fibre-optic lines and the rolling out of new services.
- The local telephone co-operatives are also expected to move towards 100% digital switching, with the number of co-operatives using analogue lines expected to drop to five by the end of 1999. Already some co-operatives have taken action to acquire new legal status in the run up to the 2001 liberalisation of the market, one notable example being the La Paz co-operative (Cotel), which was restructured to attract new investments and build links with other international and local telephone companies. This trend is likely to be adopted by other co-operatives in the run up to 2001.
- In the satellite sector, Entel will, in order to fulfil its Universal Service Obligation (USO) and service neglected remote rural areas, complete the installation of ‘space phone’ terminals, a technology which will be aimed at replacing its terrestrial radio technologies

- Considerable emphasis will also be placed on the development of the cable sector, with Entel setting up a nationwide cable TV service, either alone or in association with the existing providers, once it has finished its fibre-optic network.

- All the government development plans detailed above will only be feasible given the right economic conditions, which could well be hampered by the gloomy current economic outlook.

External Factors

Bolivia has signed a Free Trade Agreement with MERCOSUR (Brazil, Argentina, Paraguay, Uruguay and associate member Chile) which became effective on March 1,1997. Under this agreement, Bolivia became like Chile an associate member of MERCOSUR.

At the 1994 Summit of the Americas, the presidents of the region endorsed the following regulatory requirements:

- Universal access in existing and emerging technologies
- Clear and stable laws, regulations and safeguards
- Allowing competition in (intra-country) telecommunications no later than 2005
- Separation of regulatory entity from main operator
- Adaptable legislation in order to protect changing demands in relation to intellectual property rights, privacy and security of information
- Rate re-balancing in order to move gradually towards cost-based rates

Bolivia has also signed Bilateral Trade Agreements with some South American countries, which eliminate or reduce tariffs on explicit lists of products. Bolivia signed a Free Trade Agreement with Mexico in 1994. The European Union, Japan and the United States all allow most Bolivian exports to enter their markets at either duty free or reduced duty rates.

Upcoming Developments

- **2000:** Completion of Entel's fibre-optic network to Brazil
- **November 28 2001:** New telecommunications operators can start offering services, following the termination of exclusive telecommunications services on 27 November 2001
- **End of 2001:** All cable TV companies will be authorised to use their existing infrastructure to provide internet, computerised telephony and data transmission services

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