

# **“Broadband Wireless and WiMAX Brazilian Market Analysis 2005-2010”**

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## About Maravedis

Maravedis is an objective, third party research and analysis firm focusing on Broadband Wireless technologies including WiMAX, 802.20, TD-CDMA and Wireless Local Loop Systems.

Maravedis' mission is to be the most trusted bridge between the world of fixed-mobile convergence and the world of real deployments and sound business models.

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## Executive Summary

### Background

Brazil privatized its telecom industry in 1998. The country's size and stable economy make it an attractive market for telecom firms based outside the country. These include America Movil, which is based in Mexico, and Telefónica, which is based in Spain and owns Telefónica Móviles.

Between 2001 and 2004, internet usage in Brazil rose by almost 700 percent. This growth was primarily driven by a reduction in operating costs and an increase in internet speed. However, Brazil had a broadband penetration rate of only 1.9 percent as of September 2005, slightly below the regional average; and the country's 3.46 million broadband connections represented less than 10% of its 40 million wireline subscribers. These figures indicate that broadband has considerable potential for growth.

Brazilian cellular communications has grown rapidly, with total subscribers at 57 million as of the end of August 2005, up 42% from a year earlier. ANATEL - the Telecommunications Regulator Agency (Agência Nacional de Telecomunicações) - announced that this figure reached 85 million at the end of 2005, which would make Brazil the fourth largest cellular subscriber base in the world. In this respect, Brazil has been one of the two most active Latin American nations, along with Mexico, in promoting broadband fixed wireless services and in testing both fixed and portable solutions.

Despite the wireless investment activity in Brazil, interest in 3G technology is remarkably low. Several mobile operators have stated that they intend to recover some of their existing investment in GSM/GPRS before moving to 3G and that their priorities were to obtain more spectrum for basic services and to rapidly move to high value services such as video. They want to deliver mobile broadband in a shorter timeframe than is possible with 3G, because of either ANATEL's reluctance to set a timeline for auctioning 3G spectrum or the operators' own economic pressures. But Brazil's operators have new choices: open up 3G bands for non-3G services, including additional 2G coverage; or use broadband wireless to create islands of high-data-rate, high-margin offerings.

### BWA/WIMAX Regulation

The Brazilian telecommunications administration has a program called Service of Digital Communications (SCD), which aims to bring internet access to remote areas. Government agencies are working very closely with Intel to stimulate the use of WiMAX technology in Brazil. The radio spectrum is managed by ANATEL.

In November of 2002, ANATEL initiated an auction of blocks in the 3.5 GHz and 10.5 GHz frequency bands for PMP (Point-to-Multipoint) services. In February 2003, some licenses were awarded in the 3.5 GHz and 10.5 GHz bands.

The objective of this public auction was to award 28 pairs of 3.5 GHz blocks of frequency with bandwidth of 1.75 MHz, structured in three intra-country Regions (I, II and III) and several area codes.

The companies that acquired 3.5 GHz frequency blocks were

- EMBRATEL (TELMEX)
- DirectNet (Neovia)
- Grupo Editorial Sinos
- Vant (Brasil Telecom)
- WKVE

Also in Brazil, Neotec, a consortium of MMDS operators, has tested NextNet equipment in urban areas, using the MMDS spectrum that many Brazilian operators own for television services. Indeed, ANATEL recently approved new regulations for the 2.5 GHz MMDS band in Brazil, enabling licensees to provide advanced services suitable for convergence and mobility. The 186 MHz bandwidth now assigned to carriers will be preserved if the spectrum is being used for commercial deployments. Another key development is that the licensees may provide Multimedia Communications Services that include mobility, on 110 MHz of their bands, thereby enabling highly attractive applications. However, these changes to the regulation will not become effective until later in 2006.

### **Market Drivers**

Proper regulation is thus one of the important drivers. Applications driving broadband penetration are fast internet bundled with VoIP services and that mostly large players such as telcos are capable of driving the WiMAX market to a mass phenomenon. ADSL extension and last mile connectivity to corporate users represent the major drivers for the market in the next year.

The major WiMAX players in Brazil also include the wired operators: Telefónica, TELEMAR/Oi, Brasil Telecom and TELMEX/EMBRATEL. Other potential major players include mobile operator Vivo (owned by Telefonica & Portugal Telecom).

### **What to expect in 2006-2007**

In October 2005, ANATEL started a new process to auction the remaining frequency blocks in the 3.5 GHz band, but by request of several operators, this was extended to January of 2006. Meanwhile, the federal government expressed concerns about the Public Consultation of August 2005 (which were then addressed by ANATEL's opening the October 2005 RFP to telco operators) and

ordered a new Public Consultation that ended in January 2006. Now the Brazilian players are anxiously waiting for the new auction to start sometime in June-July 2006 before the federal elections due in October 2006. The auction should take only about 1 week to conduct, considering the efficient online bidding system.

**This auction should be very competitive with close to fifty companies interested in bidding!** Some large telco operators such as TELEMAR/Oi and Telefônica want spectrum to deploy WiMAX. Other large players such as Brasil Telecom also are interested in increasing their coverage areas.

Regarding 2.5 GHz frequency, we believe that ANATEL is going to issue a Public Consultation to auction spectrum in 2007. TVA (a cable company) and Samsung are going to trial WiMAX mobile services in São Paulo during 2Q06.

### **Upcoming Licenses for 3G**

Brazil has not issued 3G licenses as of March 2006. The 3G Americas group, an association of mobile telephony operators, equipment suppliers and GSM-standard service providers, believes that it would be premature to start bidding on 3G licenses in Brazil this year. ANATEL is taking this into consideration in scheduling upcoming license auctions. Telmex (CLARO), Telemar (Oi), Brasil telecom and ViVO are all mixed operators with both fixed and mobile businesses already in place. WiMAX is thus considered in both spaces. However the role of WiMAX in their future mobile networks is still uncertain. On the other hand, purely mobile operators such as TIM are also seriously looking into WiMAX potentialities.

### **Challenges**

Brazil is a very price-sensitive market. Demand for broadband services is exploding, but both service providers and residential end-users demand very low cost CPE (in the \$100 range) to adopt WiMAX extensively. So far, the demand for broadband wireless services has been mainly driven by high-end corporate and government users.

Further, many of the cash-rich operators we interviewed said that they prefer not to commit to large network deployments until the mobile WiMAX version becomes widely available. These service providers, which include both current and prospective license holders, view 802.16e as the best choice for both fixed and mobile applications. The next two years will be key for WiMAX adoption in the country.

EMBRATEL and Brasil Telecom has postponed investing in WiMAX to 2007 in favor of 802.16e, while mobile operators will not be making any substantial investments in WiMAX before 2008, as they are focused on upgrading their cellular networks.

On the regulatory front, WiMAX mobile is not yet permitted by ANATEL. There is a change in regulation to allow WiMAX mobile to be used in the 2.5 GHz band, but this change is not yet effective. ANATEL does not yet allow mobile applications in the 3.5 GHz band either. Cellular operators with vested interests may resist any regulatory changes if they do not see WiMAX as a viable option to overlay their existing networks.

### **Market Forecasts**

In 2005, the BWA equipment market opportunity was a mere US\$6 million, dominated by deployments of unlicensed 5.8 GHz equipment by WISPs and corporate users. However, Maravedis believes that with the upcoming auction, the certification of new equipment, and lower-cost equipment, the annual 3.5 GHz equipment opportunity will increase from US\$1 million in 2005 to US\$33 million in 2010. The 2.5 GHz market opportunity will also become substantial, with shipments projected at US\$31 million by 2010. Overall, the total accumulated equipment market for BWA/WiMAX in Brazil should reach US\$300 million by 2010, which makes Brazil a key market for BWA/WiMAX vendors for years to come.

With regard to BWA/WiMAX, Maravedis projects an accumulated 768,000 subscribers by 2010 among residential and business users. WiMAX subscribers should represent two-thirds of this figure. Approximately 70% of the WiMAX subscribers will be mobile customers who are predominately residential, while fixed WiMAX will continue to be driven by large corporations followed by SME customers.

## Methodology & Assumptions

The research was conducted through two main channels:

### Secondary Sources

Maravedis always endeavors to provide our clients with a new and unique perspective of the industry based on our own research. To ensure that we add value to the information already available to stakeholders in the industry, we reviewed most of the market research available on broadband wireless access in Brazil, including

- ITU Statistical Yearbook 2004
- The World Bank Development Indicators 2005
- Numerous articles

### Primary Sources

Primary research is a lengthy but indispensable process for market research because it yields data neither biased nor distorted by intermediaries. As part of this research, Maravedis conducted interviews with the following:

- Interviews with all service providers listed in the report
- Interviews with ANATEL
- Interviews with country managers of equipment vendors active in the Brazilian market

The survey took place from January to March 2006 and involved discussions with product managers, marketing managers, regulators, technologists and sales people at all organizational levels.