

# Outstanding Issues for WiMAX

Alexis Vassilopoulos  
e-business Center PwC&IESE  
01/11/06



WiMAX's initial offering for broadband via radio waves is aimed at providing service in areas with no ADSL coverage. In order for WiMAX to become one of the standards selected as a complement for 4G mobile telephone networks, it must first get past a couple of outstanding issues: the development of a sustainable business model and the allocation of the radio spectrum.

Alcatel, Siemens and other wireless equipment providers are testing out the latest WiMAX chip from Intel. Rosedale 2 (its code name) supports both the WiMAX fixed standard, IEEE 802.16-2004, and the WiMAX mobile standard, IEEE 802.16e-2005. Without a doubt, Intel would be thrilled to have the large providers adopt the same CPE (customer-premises equipment), for both mobile and fixed applications, as this would allow them to work with a larger economy of scale. Intel, the world leader in processors, is hoping that WiMAX allows the company to increase its role in the telecommunications market, particularly in the area of mobile networks. With this goal in mind, in July of this year Intel Capital invested \$600 million in Clearwire, cell phone pioneer Craig McCaw's latest company.

Clearwire is being presented as an alternative to ADSL or cable connections by offering wireless broadband services, mainly in rural areas in the US with limited access. In Spain, companies such as Iberbanda—which after the sale of 51% of its stock went under the control of Telefónica—have been working since 2003 to offer wireless networks to provide coverage in areas where ADSL networks do not. These networks—relay centers—are prepared for the certified WiMAX standards.

Euskaltel has also begun to provide broadband connections through WiMAX radio waves, in this case in rural towns of the Basque Country. Neo Sky, part of the Iberdrola group, understands that its LMDS networks will evolve into WiMAX at the end of 2006 in a testing phase, to ready for a launch in the second half of 2007.

## **WiMAX as a Substitute**

To the engineers, WiMAX does not represent a disruptive technology, given its well-known predecessors: microwave data transmission technologies such as LMDS and MMDS. The key feature that WiMAX brings is the standardization effort, which should allow its arrival to the mass market. Such a happening of course would also mean the corresponding commoditization, which would at the same time lead to the consequent drop in margins. But equipment manufacturers hope to compensate for this with benefits expected to come from the extraordinary growth of the market. In theory this will be the case, as the majority of the world's areas are out of reach for ADSL networks, especially

in the rural world. In these environments, WiMAX will have to play a key role in the arrival of high-speed broadband connections.

Nevertheless, as pointed out in the OECD report *The Implications of WiMAX for Competition and Regulation*, if the technology is indeed ready, the same cannot be said for spectrum allocation in the different countries. Thus all those involved—including WiMAX Forum (a nonprofit association founded in 2001), manufacturers and the pertinent government bodies—must collectively face the challenge of securing the international agreements for spectrum allocation needed for its deployment.

### Differences Between Wi-Fi and WiMAX Standards

	Wi-Fi	WiMAX
<b>Spectrum allocation</b>	License exempt, free spectrum.	Designed to work with spectrum license. This spectrum is currently being regulated.
<b>Reception</b>	50 meters inside buildings.	Up to 15 km outdoors.
<b>Base Station Costs</b>	Hundreds of euros.	Thousands of euros.
<b>Required Installation</b>	Simple radiofrequency planning, no special space requirements for base stations.	Complex radiofrequency planning, as with GSM networks. Location of antenna must coincide with radiofrequency plan.
<b>Customer Devices</b>	Built into Centrino equipment.	Intel has a similar system for Centrino equipment.
<b>Feedback</b>	Supports economical ADSL/DSL networks.	Requires ample broadband networks or WiMAX network itself.
<b>Radiofrequency Technology</b>	Designed for working in frequency ranges with heavy traffic or interference.	Designed for working with licensed band frequencies with relatively no interference.

### To Find out More

The WiMAX Forum  
<http://www.wimaxforum.org>

Iberbanda  
<http://www.iberbanda.es/>

Neo-Sky

<http://www.neo-sky.com/>

Euskaltel

<http://www.euskaltel.es>

Clearwire

<http://www.clearwire.com>

Intel announces mobile WiMAX chip

<http://news.zdnet.co.uk/communications/0,39020336,39279392,00.htm>

The Implications of WiMAX for Competition and Regulation

<http://www.oecd.org/dataoecd/32/7/36218739.pdf>

Sprint bet on WiMAX

<http://online.wsj.com/public/us>