



R E S E A R C H

Wireless Broadband State of the Market 2006 – 2010

June
2006

www.SkyLightResearch.com
+1.480.563.2251

Wireless Broadband

State of the Market 2006 – 2010

Summary Overview

The intent and purpose of SLR's State of the Market report is to highlight the movement of the market and to discuss trends in the shipments of base stations and CPEs in relation to one another and in relation to frequencies, standards, regions, CPE form factor and application. Market share data is useful to investors looking to assess wireless broadband investments, to equipment vendors in assessment of the competitive landscape, and to service providers as they make technology decisions with the rollout of major networks. This report compares 2004 with 2005 from multiple directions and closes with a detailed forecast of the market through 2010.

The report opens with a global market share analysis that compares equipment vendor revenue for wireless broadband as a general category and then breaks that down into base station and CPE revenue and units. This is followed by an overview of the equipment vendors highlighted in the report – background in the industry, key deployments, WiMAX certification status and general status in the industry – followed by a review of standards, emerging standards and air interfaces as they affect the face of wireless broadband in the near future.

The next major section breaks down revenues by nine different frequencies and analyzes key wins and deployments in each band, as well as trends that will affect the bands' success in the future. The same principal applies with the regional analysis, which breaks down the numbers by region and sub-region. EMEA breaks out Eastern & Western Europe, the Middle East, and Africa. North America (NAM) includes the United States and Canada. Asia Pacific (APAC) is subdivided between China, Japan, Southeast Asia, and Australia/New Zealand. Latin America (LAM) encompasses all of Mexico, Central, and South America.

As a segue between history and the future, the report talks about silicon trends in general terms as they relate to equipment pricing. The section on applications and trends sheds some light on the applications that will propel personal broadband into ubiquity and the roadblocks between here and there.

The five year forecast comprises more than half of the report as it breaks out the numbers in terms of the future direction of the market – WiMAX-2004 (.16d), WiMAX-2005 (.16e), mobile WDSL (TD-CDMA, CDMA, FLASH-OFDM), multiservice, and proprietary. As WiMAX certification progresses, the WiMAX

portions of the report will be defined by pre-WiMAX and certified-WiMAX categories. Each of these categories is further broken down by nine different frequencies, 13 regions, CPE form factors, and general applications (enterprise, residential, and backhaul).

There are several appendices attached. One details global Internet subscribers and population by country. Another is a detailed discussion on the status of licensed and unlicensed spectrum in the United States. There is yet another on the availability of BRS/EBS spectrum in the United States, detailed by city.

The analysis section of the report provides a good overview of the state of the industry, with roughly 60 tables and figures. More than 200 charts and graphs complement the analysis in Excel format for those looking for even greater detail. The bulk of the data in this report and the level of detail in the numbers forecast is unsurpassed.

The following pages provide the complete table of contents with a list of figures and tables. If you are interested in purchasing the report, in part or in whole, please contact Jay Johnson, Director of Operations at Sky Light, by phone at 1.480.563.2251 or by e-mail at jay@SkyLightResearch.com.

Wireless Broadband State of the Market 2006 – 2010

Table of Contents:

REPORT METHODOLOGY	7
REPORT SPECIFICATIONS	8
EXECUTIVE SUMMARY.....	9
GLOBAL UPDATE.....	11
WORLDWIDE MARKET SHARE ANALYSIS	12
Alcatel	14
Alvarion	14
Axxcelera	16
Cambridge Broadband.....	17
Harris.....	18
IPWireless	18
Motorola	19
Navini	20
NextNet's.....	20
Proxim	21
Redline	22
Samsung	22
Siemens	23
Soma Networks.....	23
SR Telecom	24
Trango Broadband	25
Vyyo	25
WaveRider	26
Wi-LAN.....	26
ZTE,	27
CPE MARKET ANALYSIS	28
BASE STATION MARKET ANALYSIS.....	29
STANDARDS AND EMERGING STANDARDS.....	32
802.16-2004 AND FIXED WIRELESS BROADBAND	32
WiMAX-2005 AND MOBILE WIRELESS BROADBAND	32
802.20.....	33
UMTS TD-CDMA.....	34
3G.....	34
RADIO AIR INTERFACES.....	35
FREQUENCIES.....	37
3.5 GHz MARKET ANALYSIS.....	38
5 GHz MARKET ANALYSIS.....	39

OTHER (2.3 GHz, 700 MHz, ETC.) CATEGORY.....	40
<i>700 MHz Market Analysis</i>	40
<i>2.3 GHz</i>	40
<i>4.9 GHz</i>	41
<i>10.5 GHz</i>	41
<i>2.5 GHz MARKET ANALYSIS</i>	41
<i>OTHER LICENSE EXEMPT BANDS</i>	42
<i>2.4 GHz Market Analysis</i>	43
<i>900 MHz Market Analysis</i>	43
REGIONAL ANALYSIS	44
EUROPE, MIDDLE EAST, AND AFRICA.....	45
NORTH AMERICA MARKET SHARE.....	47
ASIA PACIFIC MARKET SHARE	49
LATIN AMERICA MARKET SHARE.....	53
WIMAX SILICON	55
PRICING IS THE KEY	56
APPLICATIONS & TRENDS	58
MOBILE TV.....	58
ADAPTIVE ANTENNA SYSTEMS (A.K.A. SMART ANTENNAS)	58
UNIFIED WIRELESS PLATFORMS	59
FIVE - YEAR FORECAST	60
A CLOSER LOOK: WiMAX, PROPRIETARY, MULTISERVICE & MOBILE WDSL DEFINITIONS.....	60
1. <i>Multiservice Radios</i>	60
2. <i>Wireless DSL Radios</i>	60
FORECAST ASSUMPTIONS	63
FORECAST DRIVERS	66
TARGET CUSTOMERS.....	67
TECHNOLOGY ADVANCEMENTS	69
3G FORECAST & MARKET	69
GLOBAL FIVE-YEAR MARKET FORECAST ~ BASE STATION REVENUE	71
GLOBAL FIVE-YEAR FREQUENCY FORECAST ANALYSIS	73
<i>700 MHz</i>	74
<i>2.3 GHz</i>	75
<i>2.5 GHz</i>	75
<i>3.5 GHz</i>	76
<i>Other</i>	77
<i>10.5 GHz</i>	78
<i>5 GHz</i>	78
<i>2.4 GHz</i>	79
<i>900 MHz</i>	79
FIVE – YEAR REGIONAL FORECAST ANALYSIS	80
<i>North America</i>	81
<i>Latin America</i>	83
<i>Asia Pacific</i>	84
<i>EMEA</i>	85
SHARE OF MARKET BY WIRELESS STANDARDS/TECHNOLOGY ANALYSIS	86
COST PER USER AMONG WIRELESS TECHNOLOGIES ANALYSIS	88
CPE AVERAGE SELLING PRICE (ASP) COMPARISON OUTLOOK	91
GLOBAL FIVE-YEAR FORECAST ANALYSIS - MULTISERVICE RADIOS	99
GLOBAL FIVE-YEAR FORECAST ANALYSIS - PROPRIETARY FIXED WDSL RADIOS	103
GLOBAL FIVE-YEAR FORECAST ANALYSIS - WiMAX-2004 (802.16D) RADIOS.....	106
GLOBAL FIVE-YEAR FORECAST ANALYSIS -WiMAX-2005/WIBRO RADIOS	110

GLOBAL FIVE-YEAR FORECAST ANALYSIS – MOBILE WDSL RADIOS.....	113
AND THE WINNER IS.....	118
APPENDIX A THE WiMAX MARKET.....	119
THE BIRTH OF WiMAX.....	119
CERTIFICATION TIMING	119
WiMAX DRIVERS	120
WiMAX CHALLENGES.....	121
APPENDIX B WIRELESS BROADBAND SEGMENTATION.....	122
APPENDIX C DETAILED USA SPECTRUM DISCUSSION	125
CONGRESS	125
FCC	127
1.7/2.1 GHz (AWS-1).....	128
1915-1920/1995-2000, 2155-2175 MHz, 2020-2025/2175-2180 MHz (AWS-2)	129
700 MHz BAND	130
2.5 GHz BAND	132
2.3 GHz BAND	135
APPENDIX D USA: EBS AND BRS SPECTRUM AVAILABILITY DATA.....	139
APPENDIX E INTERNET USERS & POPULATION BY COUNTRY	148

List of Figures

FIGURE 1 SUMMARY OF TOTAL, MULTISERVICE, PROPRIETARY WDSL, WiMAX-2004, WiMAX-2005, & MOBILE WDSL (CDMA, FLASH OFDM, TD-CDMA) RADIO REVENUE FORECAST 2004 - 2010	10
FIGURE 2 GLOBAL BASE STATION & CPE QUARTERLY SHARE OF SALES~2003-2005	30
FIGURE 3 GLOBAL NUMBER OF CPEs TO BASE STATIONS~2001-2005	31
FIGURE 4 WiMAX CERTIFICATION PROCESS	33
FIGURE 5 GLOBAL WIRELESS BROADBAND EQUIPMENT REVENUE BY RADIO INTERFACE~2002-2005	35
FIGURE 6 GLOBAL WIRELESS BROADBAND EQUIPMENT REVENUE BY FREQUENCY 2003-2005.....	37
FIGURE 7 EMEA EQUIPMENT REVENUE SHARE BY COUNTRY REGION~2004 VS. 2005	46
FIGURE 8 ASIA PACIFIC EQUIPMENT REVENUE SHARE BY COUNTRY REGION~2004 VS. 2005	51
FIGURE 9 TOTAL WIRELESS BROADBAND MARKET SEGMENTATION DIAGRAM	62
FIGURE 10 BASE STATION REVENUE BY STANDARD OR TECHNOLOGY ~ FORECAST 2004 TO 2010.....	72
FIGURE 11 CONVERSION RATE FOR WIRELESS BROADBAND STANDARDS/TECHNOLOGIES 2004-2010	87
FIGURE 12 GLOBAL COST PER USER FORECAST BY TECHNOLOGY/STANDARD 2004-2010.....	89
FIGURE 13 GLOBAL CPE ASP FORECAST BY TECHNOLOGY/STANDARD 2004 - 2010	91
FIGURE 14 SHARE OF GLOBAL CPE UNIT FORECAST BY STANDARD/TECHNOLOGY 2004 -2010.....	93
FIGURE 15 WORLDWIDE MULTISERVICE 10 GHz & UNDER EQUIPMENT REVENUE FORECAST BY GEOGRAPHIC REGION 2004-2010	101
FIGURE 16 WORLDWIDE MULTISERVICE 10 GHz & UNDER EQUIPMENT REVENUE FORECAST BY FREQUENCY 2004-2010	102
FIGURE 17 WORLDWIDE PROPRIETARY FIXED WDSL EQUIPMENT REVENUE FORECAST BY GEOGRAPHIC REGION 2004-2010	104
FIGURE 18 WORLDWIDE PROPRIETARY FIXED WDSL EQUIPMENT REVENUE FORECAST BY FREQUENCY 2004-2010..	105
FIGURE 19 WORLDWIDE WiMAX-2004 (802.16d) EQUIPMENT REVENUE FORECAST BY GEOGRAPHIC REGION 2005-2010	108
FIGURE 20 WORLDWIDE WiMAX-2004 (802.16d) EQUIPMENT REVENUE FORECAST BY FREQUENCY 2005-2010	109
FIGURE 21 WORLDWIDE WiMAX-2005 & WiBRO EQUIPMENT REVENUE FORECAST BY GEOGRAPHIC REGION 2007-2010	112
FIGURE 22 WORLDWIDE WiMAX-2005 & WiBRO EQUIPMENT REVENUE FORECAST BY FREQUENCY 2007-2010.....	113
FIGURE 23 WORLDWIDE MOBILE WDSL EQUIPMENT REVENUE FORECAST BY GEOGRAPHIC REGION 2004-2010	115
FIGURE 24 WORLDWIDE MOBILE WDSL EQUIPMENT REVENUE FORECAST BY FREQUENCY 2004-2010	117
FIGURE 25 VIEW OF WIRELESS ACCESS TECHNOLOGIES THROUGH 2010	118

FIGURE 26 LOWER 700 MHZ BANDPLAN	130
FIGURE 27 UPPER 700 MHZ BANDPLAN.....	131
FIGURE 28 CURRENT & ADOPTED 2496-2690 MHZ BANDPLANS.....	133
FIGURE 29 WCS BANDPLAN.....	135

List of Tables

TABLE 1 GLOBAL WIRELESS BROADBAND EQUIPMENT REVENUE & MARKET SHARE 2004 & 2005.....	11
TABLE 2 GLOBAL WIRELESS BROADBAND CPEs – REVENUE, UNITS, & AVERAGE SELLING PRICES (ASPs)~2004 vs. 2005	28
TABLE 3 GLOBAL BASE STATION REVENUE & UNITS~2004 VS. 2005.....	29
TABLE 4 WIRELESS BROADBAND VENDORS BY AIR INTERFACE TECHNOLOGY	36
TABLE 5 WIRELESS BROADBAND REVENUE BY REGION 2004 & 2005	44
TABLE 6 EMEA EQUIPMENT REVENUE & MARKET SHARE ~ 2004 & 2005	45
TABLE 7 NORTH AMERICAN EQUIPMENT REVENUE & MARKET SHARE~ 2004 & 2005.....	48
TABLE 8 ASIA PACIFIC EQUIPMENT REVENUE & MARKET SHARE ~ 2004 & 2005	50
TABLE 9 LATIN AMERICAN EQUIPMENT REVENUE & MARKET SHARE ~ 2004 & 2005	53
TABLE 10 GLOBAL WIRELESS BROADBAND EQUIPMENT REVENUE FIVE-YEAR FORECAST ~ 2004 - 2010.....	63
TABLE 11 GLOBAL INTERNET, LANDLINE, & DSL SUBSCRIBER PENETRATION RATES.....	64
TABLE 12 GLOBAL 3G INFRASTRUCTURE REVENUE FORECAST BY TECHNOLOGY 2003 - 2010	70
TABLE 13 GLOBAL 3G HANDSET UNIT FORECAST BY TECHNOLOGY 2003 - 2010.....	71
TABLE 14 GLOBAL FIVE-YEAR FORECAST FOR EQUIPMENT REVENUE BY FREQUENCY ~ 2004 - 2010	74
TABLE 15 SHARE OF WORLDWIDE EQUIPMENT REVENUE FORECAST BY STANDARD/TECHNOLOGY - 3.5 GHz 2004-2010	77
TABLE 16 GLOBAL TOTAL WIRELESS BROADBAND EQUIPMENT REVENUE FORECAST BY REGION 2004-2010.....	81
TABLE 17 GLOBAL CPE UNIT FORECAST BY STANDARD/TECHNOLOGY 2004 -2010.....	94
TABLE 18 SHARE OF WORLDWIDE TOTAL CPE UNIT FORECAST BY FORM FACTOR 2005-2010	94
TABLE 19 WORLDWIDE TOTAL CPE ASP FORECAST BY FORM FACTOR 2005-2010	95
TABLE 20 WORLDWIDE TOTAL CPE UNIT FORECAST BY APPLICATION 2005-2010	96
TABLE 21 WORLDWIDE TOTAL CPE ASP FORECAST BY APPLICATION 2005-2010.....	98
TABLE 22 WORLDWIDE MULTISERVICE EQUIPMENT (REVENUE, UNITS, & ASP) FORECAST 2004-2010	99
TABLE 23 WORLDWIDE PROPRIETARY FIXED WDSL EQUIPMENT (REVENUE, UNITS, & ASP) FORECAST 2004-2010 ..	103
TABLE 24 WORLDWIDE WiMAX-2004 (802.16d) EQUIPMENT (REVENUE, UNITS, & ASP) FORECAST 2005-2010.....	106
TABLE 25 WORLDWIDE WiMAX-2005 & WiBRO EQUIPMENT (REVENUE, UNITS, & ASP) FORECAST 2007-2010	110
TABLE 26 WORLDWIDE MOBILE WDSL EQUIPMENT FORECAST (REVENUE, UNITS, & ASP) 2004-2010	114
TABLE 27 PRODUCT SEGMENTATION TABLE	122
TABLE 28 AWS BANDPLAN.....	129
TABLE 29 EBS AND BRS SPECTRUM AVAILABILITY DATA IN TOP MARKETS	140
TABLE 30 EBS/BRS LICENSEES WITH EXCESS SPECTRUM CAPACITY	145