

WiMAX Forum[®] Industry Research Report – March, 2009

About

The WiMAX Forum[®] Industry Research Report is a monthly summary of primary and secondary research and news, provided by WiMAX Forum to the industry. It includes the latest updates on WiMAX Forum-tracked statistics, product certification, regulatory information, technology standards and more. This report will be published and made available on the WiMAX Forum website the first week of every month. If you have any questions or comments regarding the research contained herein, please contact Jonathan Singer, the WiMAX Forum's Market Research Manager at Jonathan.Singer@wimaxforum.org.

Contents

- Executive Summary
- Global Deployment Update
 - Deployments Tracked, Deployments by Frequency, Operator updates
- POPS
 - Regional breakout, recent industry announcements
- Monthly Featured Operator Profile
- Certification
 - Total products, new products summary, vendor list
- Regulatory Update
- Survey Data
 - Device Survey demographics, high level findings
- 3rd Party Research Update

Executive Summary

Top-line highlights of this month's data include:

- 13 new WiMAX[™] network deployments were announced, ranging in size from small –Sacred Wind Communications in the USA – to large – Iberbanda's new Mobile WiMAX[™] network.
- Despite the credit crunch, money is still being invested in WiMAX technology. For example, this month Malaysian WiMAX Operator Packet One Networks announced that it would invest heavily in Chilean operator Inverca Telecommunications (for more information, see *Regulatory Update* below).
- WiMAX Forum conducted primary and secondary research in February showing that WiMAX deployments cover more than 430 Million POPs worldwide, and are forecasted to reach 800 Million POPs by the end of 2010.
- This month's featured operator case study highlights VMAX Telecom, an upcoming Taiwanese WiMAX operator

- WiMAX Forum Designated Certification Laboratories (WFDCL's) produced 15 WiMAX Forum Certified™ products in Q1 2009.
- WiMAX Forum conducted a major survey of over 70 operators on their attitudes and plans regarding WiMAX devices. Respondents included major WiMAX operators such as Clearwire, KT, UQ, Unwired Australia, Irish Broadband, Wateen, and more...

Global Deployment Update

This section describes the current state of WiMAX deployments across the world. The data for this tool is delivered to us courtesy of Informa Telecoms & Media, and can be viewed online in more detail at www.wimaxmaps.org. Please note that the numbers below do not represent total WiMAX networks in existence, but rather the total deployments that we currently track. Every month we find more data on new deployments or existing deployments and add them to the database. If you are an operator, please check WiMAX Maps to make sure that your organization's information is accurate. If it is either not there or is inaccurate, please email deploymentdata@wimaxforum.org, and we will update our information immediately.

TOTAL DEPLOYMENTS*

**Note: "Deployments" in this case refers to WiMAX networks that are either in service or planned/in deployment (i.e. base stations are being deployed, but there are few/no subscribers yet).*

Total Deployments Tracked	468
<i>Total Deployments Tracked Last Month</i>	455
Total Countries** with WiMAX Deployments	139
<i>Last Month</i>	135

***Note: "Countries" in this case is representative of distinct telecommunications markets, and therefore this number may equal more than the total number of sovereign nations recognized by the UN. For example, Hong Kong and China have different regulatory structures, and are therefore treated as different markets.*

DEPLOYMENTS BY REGION

Africa	95
Asia-Pacific	72
CALA	96
Eastern Europe	75
Middle East	18
North America (USA/Canada)	48
Western Europe	64

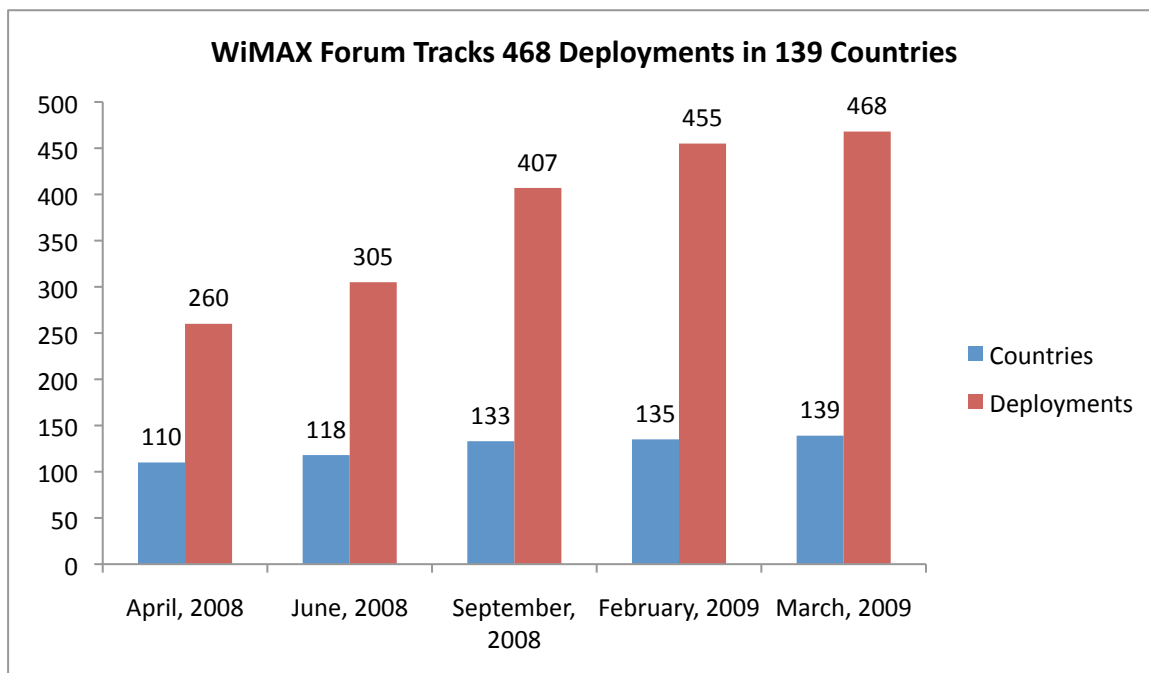
DEPLOYMENTS BY FREQUENCY

2.3 GHz Deployments***	26
2.5 GHz Deployments***	58
3.3 GHz Deployments***	9
3.5 GHz Deployments***	230
5+ GHz Deployments***	18

***Note: In above table total deployment by Frequency may not add up to total deployments tracked. The missing deployments' statuses are unknown, and will be confirmed and updated.

In March, 2009 we tracked an additional 13 WiMAX networks:

- Algeria - AnwarNet
- Australia – BigPond, Energy Australia
- The Gambia - QuantumNet
- Iraq - Kalimat
- Jordan - Mada Communications
- The Phillipines - Globe Telecom
- Spain - Iberbanda (*Note: Iberbanda's older IEEE802.16-2004 was already in our database. This month Iberbanda opened a new IEEE 802.16e-2005 network*)
- Sudan - JetNet
- Tanzania - Simbanet
- USA - IDT Spectrum
- USA - Sacred Wind Communications
- USA - Wes-Tex Telecommunications



For more information, please visit www.wimaxmaps.org.

POPs Coverage

On February 11th, 2009, WiMAX Forum announced that WiMAX service providers cover at least **430 Million** people. Below is a regional breakout of the estimate:

Region	POPs Covered
Africa	52,000,000
Asia-Pacific	205,000,000
CALA	49,500,000
Eastern Europe	45,300,000
Middle East	20,000,000
North America	28,000,000
Western Europe	34,600,000
TOTAL	434,400,000

These numbers represent an estimate conducted by WiMAX Forum via primary and secondary research of operator POPs coverage on an operator-by-operator basis. Where the operator could not or would not respond to direct inquiry, estimates were made based on public operator statements, number of base stations, government-mandated buildout requirements, and other available information. Proprietary networks (pre-WiMAX/non-WiMAX) were **not included, and geographic overlap of operator coverage areas **was** taken into account.*

Since this research was conducted, many operators have announced changes in POPs coverage. Below are some highlights:

- In **Clearwire's** 4Q2008 earnings call, then-CEO Ben Wolff announced plans to cover 120 Million POPs by the end of 2010.
- Packet One Networks in Malaysia recently announced that it would work with ZTE to cover 30-35% of the population by EOY 2009.
- Aria, an Italian WiMAX operator, announced that it plans to reach 3,200 municipalities by 2013, with a total of 4,200 base stations covering 45 percent of the Italian population (approximately 26 million POPs)

****If you are a WiMAX operator and wish to be mentioned here, please contact Jonathan Singer, the WiMAX Forum's Market Research Manager at Jonathan.Singer@wimaxforum.org.*

Monthly Featured Operator Case Study

Upcoming WiMAX Deployments to Watch: VMAX Telecom

VMAX Telecom, a joint venture between 3G mobile carrier Vibo Telecom Inc. and broadband wireless telecom equipment maker Tecom Co., is one of six major WiMAX spectrum holders in Taiwan. Having

participated in the government's 2007 hybrid beauty contest/auction licensing program, VMAX won a 6-year license for 30MHz of spectrum in the 2.5 – 2.69 GHz band (2660 – 2690MHz) in which to deploy WiMAX to Taiwan's northern region. The terms of this license agreement originally gave VMAX (and each of the other 5 license winners) 18 months to build its infrastructure. The licenses were divided by region, with 3 licenses for Taiwan's northern half, and three in the south.

[For the full report visit: <http://www.wimaxforum.org/resources/documents/marketing/casestudies>]

WiMAX Forum Certified™ Products

By the end of 2008, WiMAX Forum had certified a total of **82**. In 2009, WiMAX Forum expects to certify **180 new products**. In the first quarter of 2009 WiMAX Forum certified **15** new products, with the expectation for several more to be certified in early April.

	This Month	Last Month
Total WiMAX Forum Certified Products	97	90

Recent Certified Devices

Below is a list of the WiMAX devices certified in 1Q2009:

Company	Product Name	Product Type	Frequency
PointRed Telecom Pvt Ltds	PointMAX10000	Base Station	2.5 GHz
WiNetworks	WiN7200-2 Pico Base Station	Base Station	2.5 GHz
Modacom	MW-C2500E	Express Card	2.5 GHz
NEC	PA-WM3200C (or UD02NA)	PCMCIA Card	2.5 GHz
NEC	PA-WM3200U (or UD01NA)	USB Modem	2.5 GHz
OKI Networks	BR3001	USB Modem	2.5 GHz
Alcatel-Lucent	9710 CWBS	Base Station	3.5 GHz
Alcatel-Lucent	9715 LWBS	Base Station	3.5 GHz
Alvarion	BMAX 3500	Base Station	3.5 GHz
Huawei	DBS3900	Base Station	3.5 GHz
NEC	PasoWings	Base Station	3.5 GHz
Samsung	U-RAS Flexible	Base Station	3.5 GHz
ZTE	B9100+R9100	Base Station	3.5 GHz
Samsung	SWC-U200	USB Modem	3.5 GHz
Seowon Intech Co	SWU-3220	USB Modem	3.5 GHz

WiMAX Forum Certified Product Vendors

WiMAX Vendors with WF Certified Products	Total
Base Station Vendors	25
Subscriber Station Vendors	27
Mobile Station Vendors	4

- Base Station Vendors
 - Airspan Networks, Alcatel-Lucent, Alvarion, Aperto Networks, Axxcelera, Cisco Systems, E.T. Industries, Huawei Technologies, Motorola, NEC, Nokia Siemens Networks, Nortel, PointRed Telecom Pvt Ltd, POSDATA, Proxim Wireless Corporation, Redline Communications, Runcom Technologies Ltd., Samsung, Selex Communications, SEQUANS Communications, Soma Networks, SR Telecom, Telsima, WiNetworks, ZTE Corporation
- Subscriber Station Vendors
 - Airspan Networks, Alcatel-Lucent, Alvarion, Aperto Networks, Axxcelera Broadband Wireless, Beceem, E.T. Industries, Fujitsum, GCT Semiconductor, Inc., Gigaset Communications, Huawei Technologies, Intel Corporation, MODACOM Co., Ltd., Motorola, NEC, Oki Electric Industry Co., Ltd., Redline Communications, Samsung, Selex Communications, SEOWON INTECH Co., Ltd., SEQUANS Communications, Siemens AG, SR Telecom, Telsima, Wavesat Inc., ZTE Corporation, ZyXEL Communications Inc.
- Mobile Station Vendors
 - POSDATA, Runcom Technologies Ltd., Samsung, SEQUANS Communications

Regulatory Update

In partnership with WiMAX Forum Regulatory Working Group, AT4 Wireless maintains a detailed [Spectrum & Regulatory database](#). The database provides regular monthly updates detailing global regulatory proceedings. Below are some top-line highlights from this month's report

MARCH UPDATES

- **Chile: Winner of 2.3 GHz license announced** – On March 19th the Chilean government announced that it had awarded a license for 30 MHz of spectrum in the 2.3 GHz band to INVERCA Telecommunications, which asked for no government subsidies in its proposal. INVERCA enjoys the support of Malaysian WiMAX operator Packet One Networks, which promised to contribute \$100 Million of the estimated \$117 Million it will cost to build the network.
- **Spain: Summary of Responses to the public consultation on the 2.6 GHz and 3.5 GHz bands** – On March 11th the Spanish Ministry of Industry, Tourism and Trade published a summary of responses to its public consultation regarding the 2500-2690MHz and 3.5GHz ranges. No decision has yet been reached on how to award concessions within the 2.5 GHz band; however,

it decided to be in favor of introducing mobile services in the 3.5 GHz band. The Ministry stated in its response that the most appropriate technology to use is WiMAX (TDD).

- **United Kingdom: Update on the 2.5 GHz Controversy** – On March 25th Ofcom published an update on the litigation process initiated by T-Mobile and O2. T-Mobile has indicated that it will no longer pursue its claim; however, O2 argues that despite T-Mobile's withdrawal, its claim should continue. The High Court will hold a hearing on May 19th, 2009 to decide whether or not O2 will be granted permission to continue. A judgment in favor of Ofcom could allow Ofcom to open the application process for acquiring spectrum this summer.
- **Iran: Award of WiMAX Licenses in the 3400 – 3800 MHz band** – On March 11th, the Iranian Communications Regulatory Authority granted 4 six-year licenses for operators to offer fixed WiMAX services in Iran. The winners are:
 - Paya Communication Ind. & Iran Mobin Consortium
 - MTN IranCell
 - MTCE
 - Rayaneh Danesh of Golestan Co.

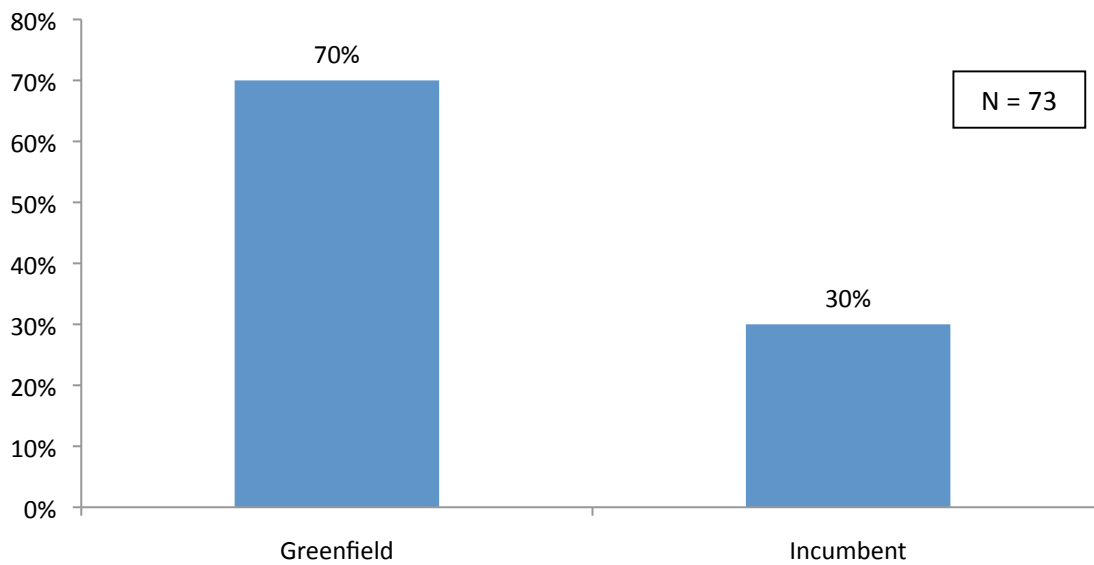
Survey Data

In 1Q2009 WiMAX Forum conducted a survey of over 70 WiMAX operators. This study, created by the WiMAX Forum Network Operators Task Force, focused on operators' wants, needs, and plans for low cost devices. While individual responses were anonymous, we can confirm the participation of major WiMAX operators such as Clearwire, KT, UQ Communications, Irish Broadband, Wateen Telecom, TATA and others. Below are some highlights of the results. More detailed information on the survey will be made available at a later date.

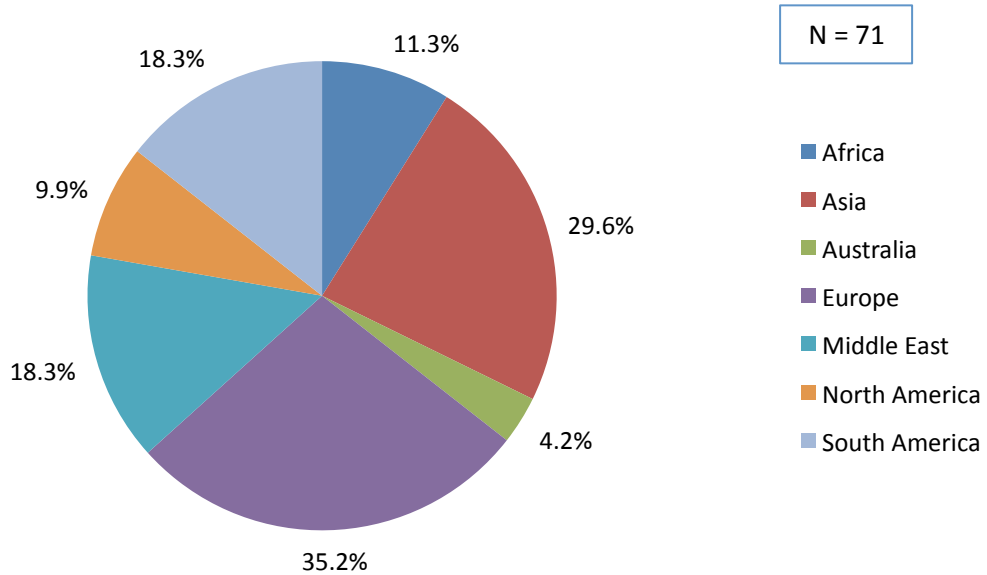
Demographic Highlights

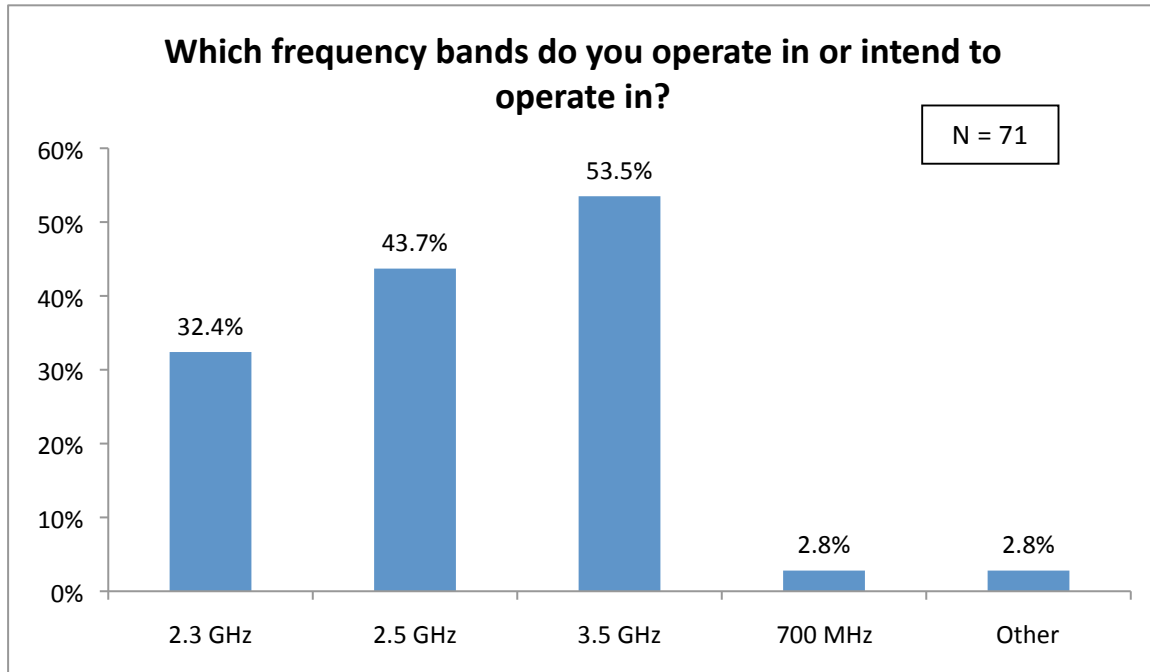
In total the survey was responded to by approximately 10-15% of global WiMAX operators. Responses came from operators of all different sizes, including both greenfield operators and incumbents. Responses also came from a variety of geographies roughly in proportion to the actual geographical segmentation of the world's WiMAX operators (excepting slightly heavier participation from the Middle East and lower participation from Africa). Despite the slight geographic skew, the results may still be reasonably used as a guide to understanding the general attitude of the WiMAX operator ecosystem.

Is your company a greenfield or an incumbent operator?



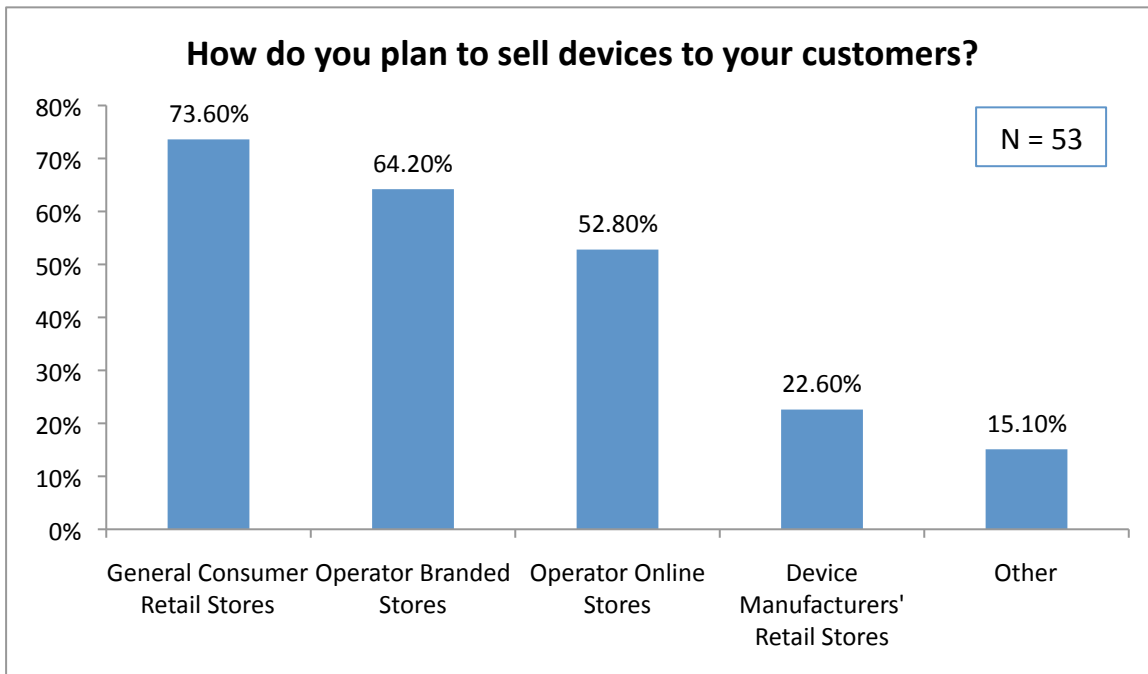
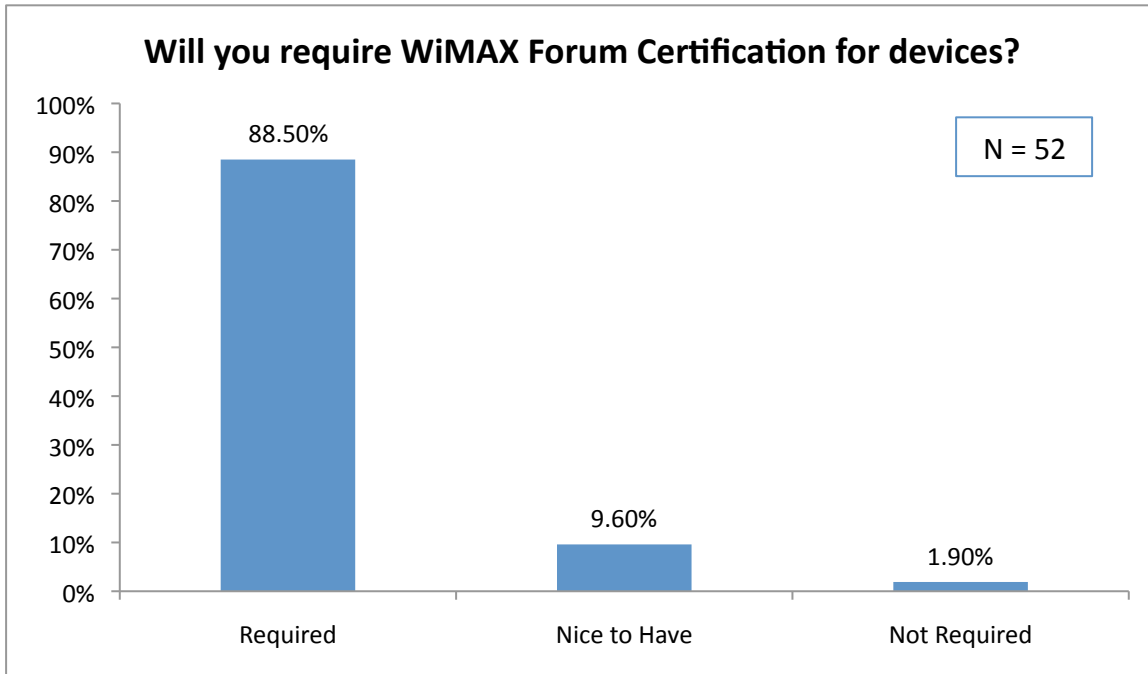
Which regions do you operate or intend to operate in?





Survey Data Highlights

Several survey questions regarding operator attitudes are important to note here, and are outlined in the charts below. Of the more than 70 participants, more than 50 responded to a question on the importance of certification. 89% of those surveyed indicated that their companies would require WiMAX Forum Certification for devices, while 10% believe it to be a definite to benefit to device manufacturers wishing to build for these operators. Only a single operator definitively said that Certification was not at all required. Another important data point is that 74% of respondents plan to sell WiMAX devices through general retail stores.



3rd Party Research Highlights

Each month WiMAX Forum highlights 3rd Party Research covering the WiMAX Industry. Below are the most recently published reports:

Mind Commerce

[WiMAX Service Providers: A Technical and Market Study](#)

Date: March 2009

The report begins with a technical overview of WiMAX and associated services. The technical discussion includes the architecture of WiMAX systems and standards, and the relationship between WiMAX and other technologies. The report then addresses WiMAX services and applications including VPN, VoIP, mobile voice, telemetry, entertainment services, VoIP-over-WiMAX, IPTV-over-WiMAX, services for Wireless service providers, and rural connectivity services. In addition, the report present information about services from the user prospective, and introduces WiMAX usage scenarios. The report also provides a comprehensive analysis for WiMAX services market, including market definition, ecosystem and value chain, service providers analysis (e.g. who is doing what), overall analysis for service providers. The report also goes deeply in value chain by discussing the structure of value chain, and partnership analysis.

Skylight Research

[WiMAX & Wireless Broadband Market Share Report End of Year 2008 & 4Q 2008](#)

Date: March, 2009

Skylight's piece provides WiMAX and pre WiMAX equipment statistics. A global and regional picture for equipment vendors, along with base station, sector, and subscriber device shipments by region is provided.

MIC

[Global WiMAX Market Development in 2008](#)

Date: February 2009

This report presents WiMAX market development in 2008 by country in Europe, the Americas, Asia, Africa, and Oceania, focusing on individual telecom operators' WiMAX deployment and their cooperation with equipment providers as of January 2009. This report observes more than 300 telecom operators from over 100 countries. The information in this report is arranged, with operator data grouped by continent and country.

MIC

[The Taiwanese WiMAX Industry, 4Q 2008](#)

Date: January 2009

MIC presents Taiwanese WiMAX CPE shipment volume and value forecast and recent quarter review of shipment volume, value, ASP, shipment ranking, and product mix. The report also provides price trends, production locations, shipment destinations, business types by ODM/OEM/OBM, and customer portfolios.

In-Stat

[Mobile WiMAX—Global Review of Infrastructure and Services](#)

Date: January 2009

In-Stat gives a global review of Mobile WiMAX infrastructure and services. This includes data on certification, deployments, vendor sales and subscriber estimates.

Mind Commerce

[WiMAX: The Educational Broadband Services Solution - How EBS License Holders Can Keep Their Licenses While Serving Their Students](#)

Date: January 2009

Mind Commerce makes a case for WiMAX as the most effective wireless broadband technology for educational services enabling school districts to keep their 2.5 GHz licenses.

Sidecuts

[Game On, WiMax! - Why the 'New' Clearwire gives WiMax its Best Chance at Success in the U.S. marketplace](#)

Date: January 2009

Sidecuts gives its opinion on why it believes that the “New” Clearwire gives WiMax its best chance at success in the U.S. marketplace. This piece focuses on giving an in-depth look at the \$3.2 billion agreement between Sprint, Clearwire, Google, Comcast, Intel and Time Warner Cable, and discusses how Sidecuts believes it may change the landscape for broadband deployment in the U.S.