

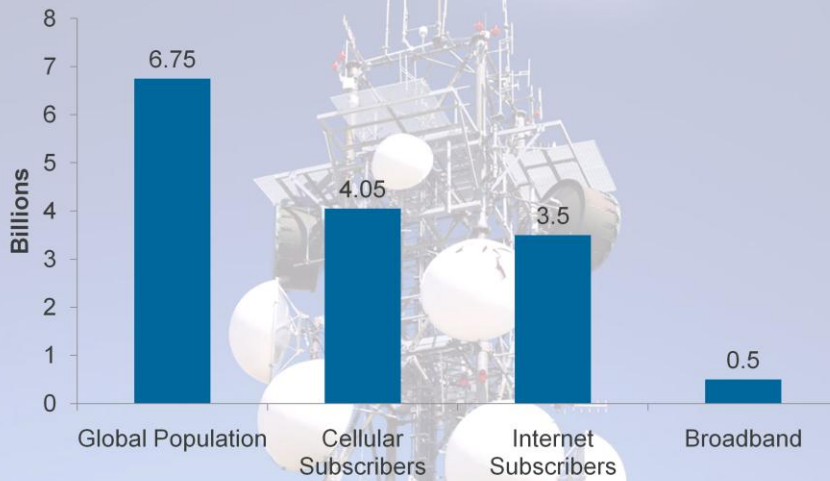


• *WiMAX is all about a technology that delivers affordable mobile broadband access for consumers to use anywhere, anytime, and it's here*

• **Key messages:**

- Operators: Deploy now!
- Regulators: Make more spectrum available now!
- Investors: A bet on WiMAX is a bet on the Internet
- 4G truly should be called 1st Generation affordable Mobile broadband
- WiMAX is affordable because it is based on low cost infrastructure using OFDM/MIMO and an end to end all IP network
  - Furthermore, WiMAX allows a retail distribution model offering a broad mix of low cost devices to be used in any operators WiMAX network delivering the option for operators to avoid subsidizing devices
  - And It gets better: services are based upon open the Internet - freedom of choice – no walled garden

## Broadband Market Opportunity

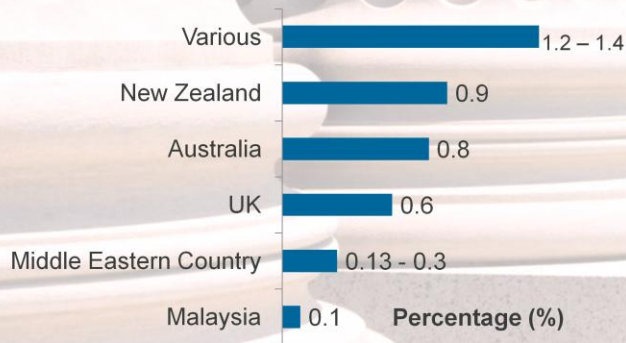


Source: Informa, 2009

- Broadband penetration across the globe is low
- WiMAX offers the chance to greatly expand the reach of true broadband access across the world

## Broadband Grows GDP .6 to .7 % per 10% of Penetration

### GDP Impact of 10% Higher Broadband Penetration



Source: McKinsey, 2009

- To remain economically competitive on a global scale, countries need to ensure enough spectrum is released.
- Despite the desire to wait for a better economy and perhaps raise more money through future spectrum auctions, governments and their respective economy and people would benefit more by acting now.
- Issuing spectrum licenses now may earn a smaller monetary gain in the short term; however, build-out of wireless mobile broadband networks will bring in foreign investment dollars, create jobs, improve education and government services, grow the economy, and quickly connect more citizens to the Internet.
- WiMAX Forum encourages regulators to accelerate broadband adoption in their country by making available spectrum to get the job done.**
  - Particularly in the 2.5 and 3.5 GHz.

## Internet Adoption In Tough Times



•During an economic downturn, historical data show consumers look inward for value entertainment and low cost activities at home in efforts to curb spending. The internet delivers on that promise providing low cost entertainment, social networking, job search, shopping for best deal, all in one bill. (ex: Craig's list to sell and buy with no fees).

•U.S. Great Depression, 1930s: low cost entertainment thrived as Hollywood's movie industry boomed

- An average 90 million Americans went to the movies weekly\*.

- 3x as many as attended movies in the 1920s, also considerably higher than the weekly figures for the following four decades.

- Radio also boomed in the 1930s

•In the US, movie box office grosses rose during five of the last seven economic downturns including the 1970s oil crisis and the dot-com bubble burst

•Despite the current economic crisis, February 2009 was one of the strongest months ever for the video game industry, with total sales of \$1.47 billion.

•Netflix success in Q1 09 profit soared as more people signed up in any other 3 month period in its history, driven by consumer's desire for cheaper forms of entertainment during the recession.

- Added 920,000 customers. Boosted Q1 profit 68% from previous year.

•Amazon.com success in Q1 09. Earnings and revenue climbed 24% Year over Year

•This activity translates into increased internet usage particularly for video

- Nielsen 4Q08 data shows mobile video growth: up to 11 million American users, an increase of 9% versus the previous quarter.

- Much of this growth can be attributed to increased mobile content and the rise of the mobile web as a viewing option.

•The Internet now with Hulu.com, YouTube, NBC.com, movie downloads from Netflix plus products such as Slingbox to watch TV over the Internet, and Skype video calls, are driving consumers to use the Internet for their best entertainment and social networking bargain. Look at the massive success of the netbook in 2008. People want Mobile Internet.

•A bet on WiMAX is a bet on the internet.

\*Source: Library of Congress; <http://memory.loc.gov/learn/features/timeline/depwwii/art/goodshow.html>

\*\*Source: Octagon, 2009

# Can Telecom Investments Navigate Today's Financial Turbulence?



## What About WiMAX?

- We know all investments as well as investment in Telecoms have tightened up
  - Credit is tight, making it difficult to raise money for CAPEX investments
  - However, mobile services continue to grow although at a slower rate. The world's mobile subscription market grew 18.5% y-o-y in 2008 (down from 22.5% growth in 2007) and is forecast by Informa to increase by 12.7% this year
- Device market problems:
  - Ave. replacement cycle likely to increase by 6-8 months in 2009 = a 5% y-o-y decline in the number of total devices sold globally to 1.16bn
  - Mostly will impact mid-tier candybar, clamshell, and slider phones – little differentiation
  - Small upgrades in major feature phones will go ignored this year; however, dramatically new and innovative devices will still earn customer dollars, as is evidenced by the hope for a new iPhone model, and the eagerness of the industry to see the upcoming Palm Pre
- Informa: Strong regional divide.
  - New subs in Africa and south Asia drive growth and the mobile device market should remain resilient.
- Bottom line: the Telecom market is still growing
- WiMAX is growing as well:
  - In 2008 we added 200 new WiMAX networks
  - 434 M POPs covered, and expect that number to double by 2010
- Despite the downturn, we continue to see headlines in the WiMAX field:
  - Malaysian YTL to Invest \$689 Million in WiMAX Network – network to be completed in 14 months
  - Tatung to Launch Mobile WiMAX in Taiwan on April 27
  - Far EastOne Prepares Free WiMAX Trial in Taiwan
  - Packet One announced that it would invest \$100 million in a new Chilean WiMAX operator: Inverca Telecommunications
  - Globe Telecom and Huawei just deployed in Phillipines largest 2.5 GHz WiMAX network
  - Clearwire has both began testing new mobile VoIP phones, and also announced that it would launch 8 new markets this year, with at least another 4 in 2010
    - 2009: Atlanta; Las Vegas; Chicago; Charlotte, N.C.; Dallas/Fort Worth; Honolulu; Philadelphia; and Seattle
    - 2010: New York, Washington, D.C., Boston and San Francisco
  - UQ launch this summer in Japan
  - Sprint announced its 4G service would follow the Clearwire deployments, and announced plans to release a tri-mode phone in 2009
  - Comsys released a reference design for a multimode GSM/WiMAX phone – this is in addition to the multimode devices already produced by Samsung and HTC
  - Samsung announces at CTIA Mondri – WiMAX Broadband Mobile Entertainer
  - And that is just a small section of our recent headlines. The bottom line is despite today's financial climate WiMAX business continues to grow.
- Expect 133 MILLION WIMAX USERS BY 2012

## WiMAX Low Cost Business Model

- Open Internet experience
- Retail distribution
- Activate at home
- Low cost access and fast
- Many new devices
- New types of services



•WiMAX is all about connecting to the internet. So in these tough economic times an investment in WiMAX is an investment in the internet.

**Major benefit of a retail model is that it breaks the traditional subsidy model for operators**

•This can result in a major savings from a decrease in customer acquisition costs

•Ex: AT&T heavily subsidizes the iPhone. In 3Q 2008 AT&T reported selling 2.4 Million 3G iPhones. However because of subsidization it spent \$900 million in customer acquisition costs related to the device, resulting in an overall YOY drop in operating margins from 35.3% to 33.8%

**Open internet business model allows participation from the CE industry:**

•Big Benefit: product selection. Look at Wi-Fi. Computers, handsets, cameras, even SD memory cards are now Wi-Fi enabled.

•Product selection begets demographic reach – the more products are out there, the more likely you have vendors building both high end devices, and low cost devices, allowing penetration of the technology into all demographic levels

**Open internet business model opens mobility to the highest levels of application innovation**

•What will people do with fast mobile Internet? Everything they do with the internet today at home and more

**Fast forward: Video will strain capacity of current data networks.**

•Nielsen: Americans consume video at record pace. Consumers watch more video than ever on the three screens of television, Internet and mobile phones.

•Nielsen\*: average US viewer watches 151+ hours of TV per month – an all-time high. Americans who watch video over the Internet consume another 3 hours of monthly online video and those who use mobile video watch nearly 4 hours per month on mobile phones and other devices.

**Roadmap and technology**

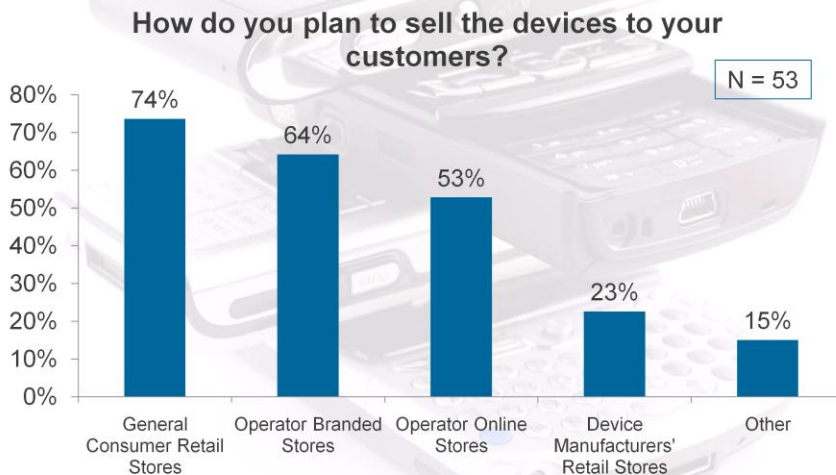
•The WiMAX roadmap continues to evolve to improve the Mobile Internet experience to satisfy growing demand for constant access anywhere, anytime, for work and personal communications and entertainment. The WiMAX Forum works closely with industry organizations such as ITU, IEEE, OMA to realize this vision and deliver best in class technology to satisfy the growing global consumer demand for fast personal mobile broadband services and the plethora of applications waiting to be deployed over mobile Internet .

•WiMAX Forum works with key partners to ensure a robust best in class air interface roadmap. The IEEE is writing the 802.16m standard to be completed by 2010 and the WiMAX Forum is basing its Release 2 air interface specs to meet IMT-Advanced requirements and timelines

•WiMAX Forum network specs, roaming specs, certification, etc. are on the same upgrade schedule

•Mobile WiMAX Release 2 will be backward compatible with Mobile WiMAX Rel. 1.0 & 1.5

## WiMAX Operators Want the Retail Distribution Model



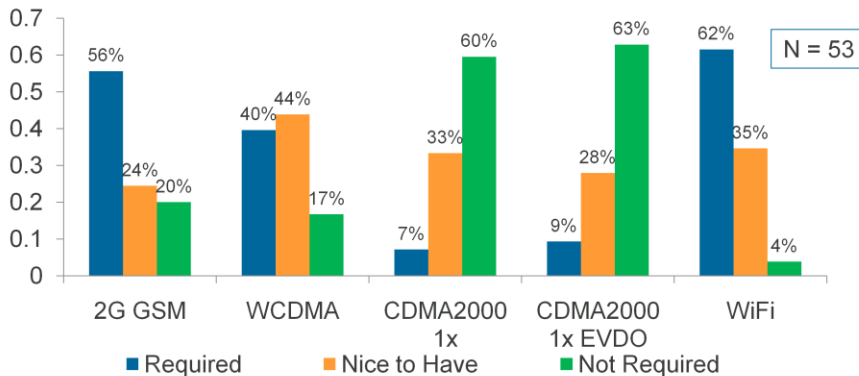
Source: Results from WMF NOTF Low Cost Device Survey, March 2009.

- In March, 2009 the WiMAX Forum surveyed over 50 WiMAX Operators. Of the 53 who responded to this question, 74% responded that they plan to (or already do) sell WiMAX devices in retail stores
- This shows that the retail model resonates with WiMAX Operators.
- Compare GSM and CDMA and their service model:
- GSM is more friendly to the retail model because of separate phone and Sim card; however most customers still need to go to the operator's authorized locations to activate.
- With a WiMAX network, a product sold at any retailer, the consumer can self activate in five minutes. This opens the market up to greater variety of sales outlets.
- Telecom operators have a choice to not subsidize the device, a model more favorable to the CE market, which already have a robust distribution channel

This survey included responses from major operators such as: Clearwire, KT, Unwired Australia, Irish Broadband, WiMAX Telecom, Wateen, Digicel, Inukshuk, Digital Bridge, Freedom4Wireless, Max Telecom, Craig Wireless, Packet 1, UK Broadband, TATA, Sify, DBD

## WiMAX and GSM/3G Voice – The Perfect Marriage

Which non-WiMAX networks should the phone support?



Source: Results from WMF NOTF Low Cost Device Survey, March 2009



- In our recent survey of WiMAX Operators, we asked respondents about their preferences for dual-mode WiMAX/Voice phones. The data shows that in addition to a strong preference for Wi-Fi, operators want dual-mode WiMAX-2/3G phones.

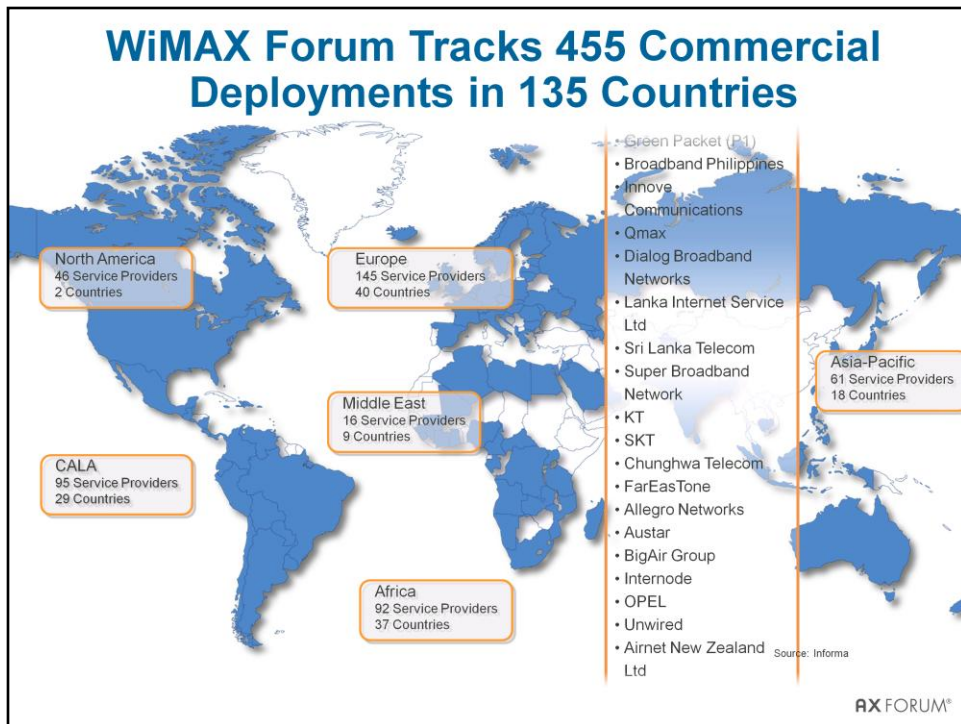
- It is important to note that in this figure the CDMA numbers are smaller primarily because of GSM's vastly larger global footprint.

- Check out the HTC 4G Max. HTC MAX 4G is the world's first dual-mode GSM/Mobile WiMAX handset. It is made for Yota by HTC and allows users of any GSM network to insert their own SIM cards for voice calls; and, when a call is initiated between two 4G Max users, the device instead initiates a VoIP session over the Mobile WiMAX network.

# WiMAX: WHY WAIT?



- WiMAX is the Internet Technology of Choice for Greenfield Operators
- In March 2009, WiMAX Forum conducted a survey of over 72 WiMAX Operators. Of those who responded, 70% were Greenfield Operators.
- Why wait? The only available 4G technology is WiMAX.
- WiMAX will any operator a time to market advantage – this is particularly important for Greenfield operators
  - Take a cue from 3G, and look at Hutchison: Hutchison was a greenfield 3G operator that started service 2 years before Vodafone, O2, Orange, and T-Mobile; and it gained an incredible subscriber lead over all of them because of its head start
- Why wait? WiMAX is here now, and it's here to stay.



- Last year in Singapore we announced that there were 260 commercial WiMAX deployments in over 110 countries across the world.
- Now, one year later WiMAX Forum tracks more than 455 WiMAX networks in 135 countries

# Number of WiMAX POPs 434 Million Now Forecast to 800 Million 2010

Region	POPs Covered
Africa	52,000,000
Asia-Pacific	205,000,000
CALA	49,500,000
Eastern Europe	43,300,000
Middle East	20,000,000
North America	28,000,000
Western Europe	34,600,000
<b>Total</b>	<b>434,400,000</b>

Source: WiMAX Forum; <http://www.wimaxforum.org/resources/research-dashboard>

- 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
- Geographic overlap of operator coverage areas **was** taken into account
- You can find this data on the WiMAX Forum Research Dashboard, and in the WiMAX Forum Monthly Industry Research Report:  
<http://www.wimaxforum.org/resources/research-dashboard>

# Operators Demand Certification

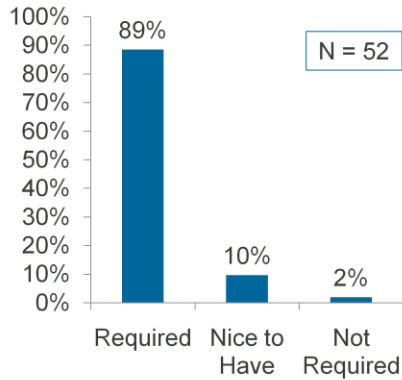
“We will expect all WiMAX products to become IOT Certified before entering an operator’s network.”

**Ali Tabassi, Senior VP of Global Ecosystem and Standards, Clearwire**

“A variety of WiMAX Forum Certified end products are indispensable for UQ pursuing the retail distribution business model.”

**Takashi Tanaka, President, UQ Communications Inc.**

## Will you require WiMAX Forum Certification?



Source: Results from WMF NOTF Low Cost Device Survey, March 2009.



- The benefits of certification clearly resonate with operators. In a recent survey of WiMAX Operators, 89% of those responding stated that they will require WiMAX Forum Certification for products on their network.
- Certification is the foundation of the retail model such that when a product is purchased it will work in any WiMAX network, which as we discussed earlier is another concept that resonates with operators.

## Investors: WiMAX is the Right Decision for Mobile Internet



- WiMAX is an investment in the internet, an investment in the future of both communications and entertainment.
- WiMAX as a technology has the endorsement of over 450 operators across the globe.
- Take the risk.

## Operators: Deploy Now!



- **WiMAX is the right decision.**
- It now has a proven technology and business model.
- Now is the time to get involved and maximize your time to market advantage.
- Don't wait. 4G is here.



**THANK YOU**

wimaxforum.org

