

# WIMAX IN EMERGING MARKETS

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# Telebriefing roadmap

- Demand for fixed and mobile WiMAX in emerging markets
- Market dynamics in developed and emerging countries
- Planning a WiMAX network in an emerging market

# Senza Fili Consulting

## experience in wireless data



### Technology focus

- Wireless data technologies and services:
- Wi-Fi, WiMAX, proprietary BWA, cellular (GSM, WCDMA, EV-DO, HSDPA) technologies
  - Data and VoIP services

### Approach

- Provide a bridge between technologies and services, assisting vendors and service providers
- Quantitative analysis, with an international perspective
- Carrier, enterprise and residential markets

### Services

- Business plans and financial modeling
- Business development and strategy
- Market research and forecast
- Due diligence
- Publications and training

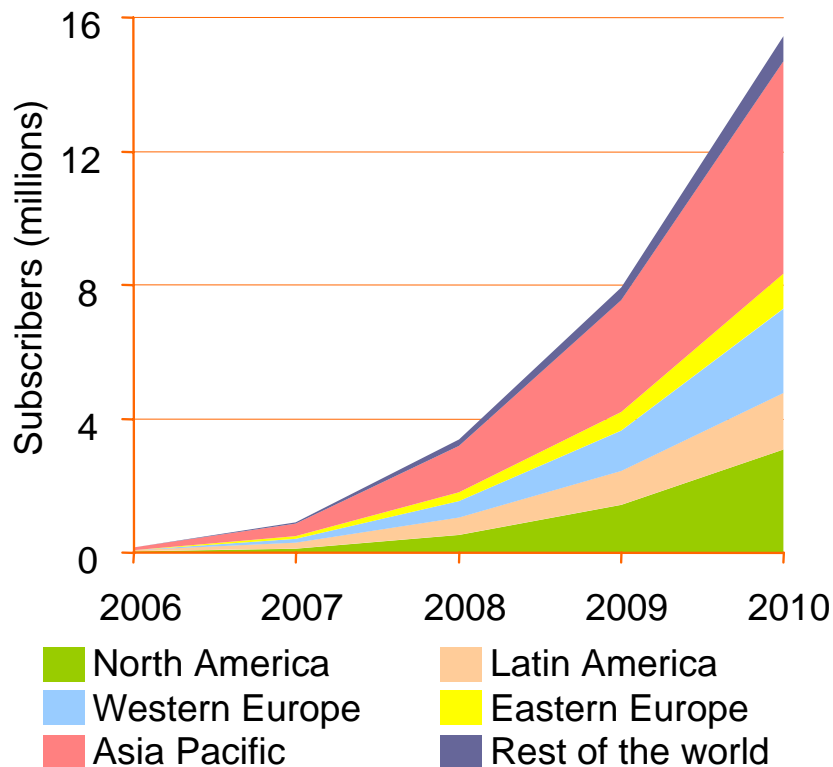
# Our latest report on WiMAX was recently published

## **Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX**

- In-depth market global forecast of demand and revenues
  - 15 countries
  - 6 regions
- Assessment of 802.16-2004 and 802.16e
  - Fixed and mobile services
  - Competing technologies
- Business models and drivers towards adoptions
  - Market segments
  - Geographic markets
  - Regulation

# Our forecast predicts 15.4 million WiMAX subscribers worldwide by 2010

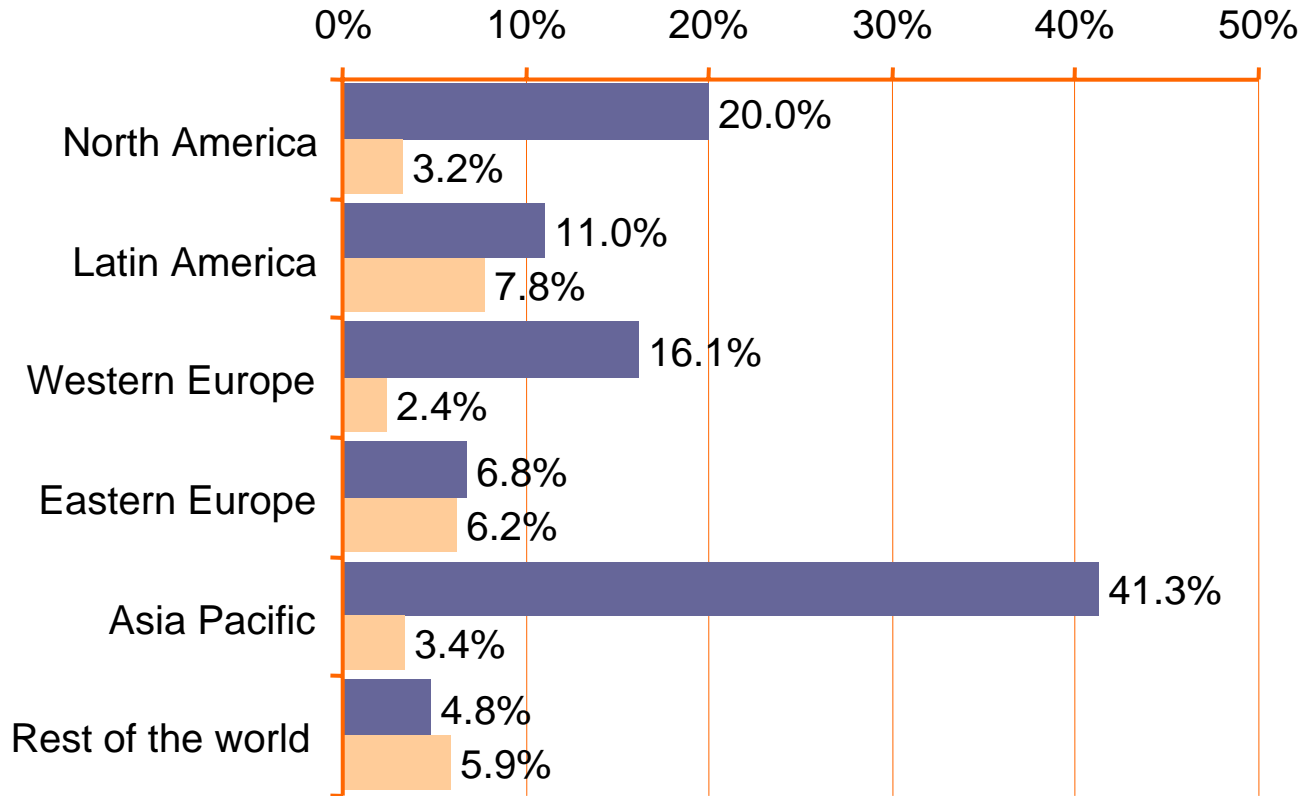
**Number of broadband subscribers by region in 2010**



Source: Senza Fili Consulting, "Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX"

- 57% of WiMAX subscribers will be using 802.16e by 2010
- US\$16.5 billion in service revenues
- Drivers to adoption are different in each market
- Asia-Pacific countries will be WiMAX largest market with 41% of subscribers
- The hottest markets:
  - Emerging countries like China and Mexico where WiMAX is a cost-effective last-mile solution
  - Countries like Korea with a high demand for portable and mobile services

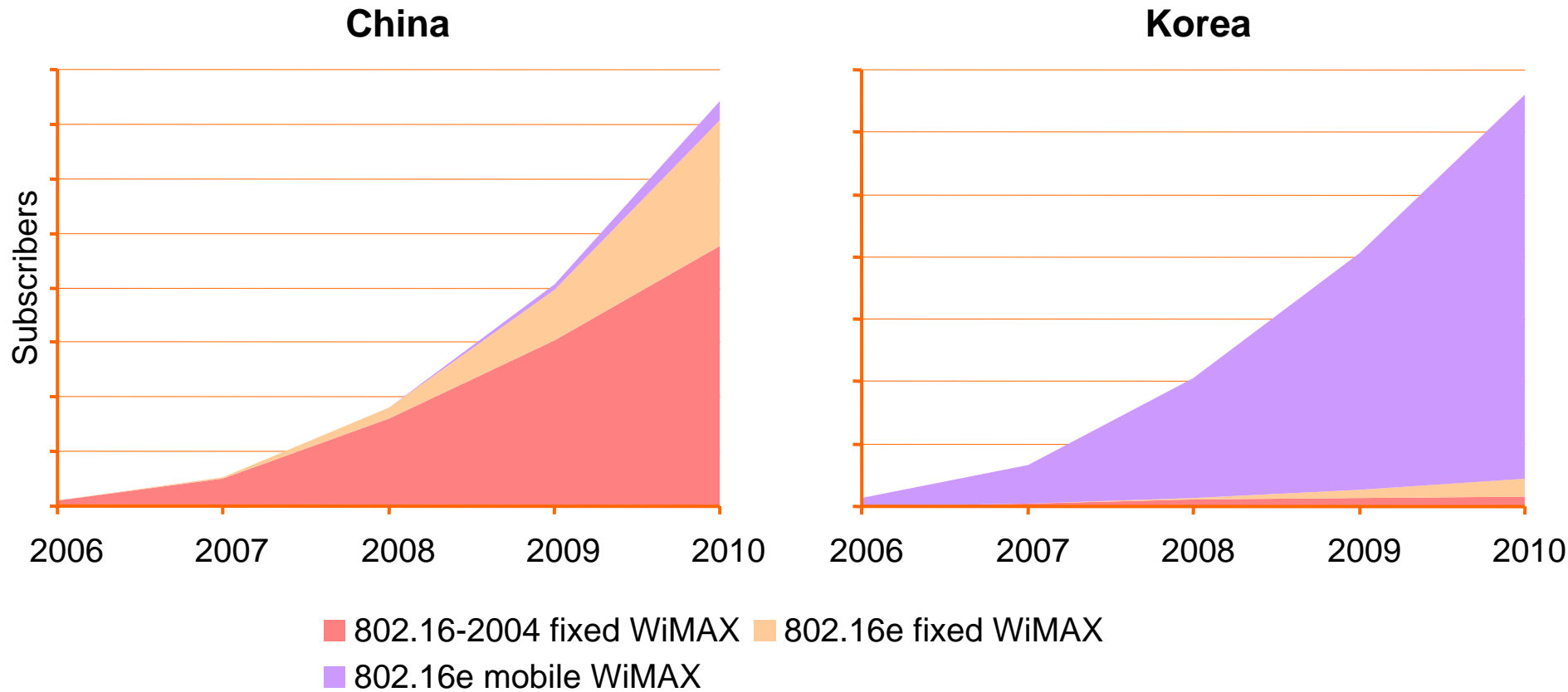
# WiMAX will have a stronger impact on broadband access in emerging markets



- WiMAX subscribers as percentage of broadband subscribers
- WiMAX subscribers as a percentage of worldwide WiMAX subscribers

Source: Senza Fili Consulting, "Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX"

# The dynamics of adoption change dramatically across markets



Note: graphs are drawn to a different scale

Source: Senza Fili Consulting, "Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX"

- Spectrum bands available
- Applications (e.g. relative importance of VoIP)
- Split between business and consumer users
- ARPU
- Market competition
  - From wireline operators
  - From wireless operators
- Timeline for demand for portable and mobile access
- Business models

# Developing markets represent the fastest growing market for WiMAX

## Developing markets

- Opportunity for WiMAX operator to gain (and retain) a dominant position in the market
- Wireless infrastructure may get established first
  - Wired networks may become unnecessary in low density areas
  - Wireless infrastructure easier to deploy, maintain and secure
- Demand for broadband connectivity is still mostly limited to urban areas
- Residential market segment is still in its early days
- Lower competition, but regulation may not favor new entrants

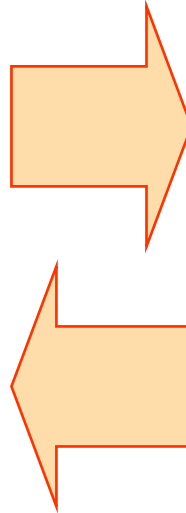
## Developed markets

- Larger market, greater demand and willingness to pay for broadband connectivity
- Competition with fixed networks is inevitable
  - Even where DSL is not currently offered, it may be introduced soon
- Established market with a slowing growth rate
  - WiMAX service providers needs to be able to go beyond first time users and lure subscribers away from DSL
- Increased demand for mobility and popularity of wireless connectivity will spur demand for WiMAX

# Who will take advantage of the WiMAX opportunity?

## Who is interested

- Greenfield operators
- Fixed operators
- Mobile carriers
- WISPs
- MMDS (wireless cable) operators
- Satellite operators
- Municipal/public partnerships



## How to evaluate the opportunity

- Rural vs urban deployment
- Fixed vs portable/mobile services
- Business vs consumer market
- Regulatory constraints
- Funding required
- Service bundling
- Competitive environment
- Differentiation from competition
- Target ARPU
- Brand development

**A detailed assessment of the market is crucial to succeed**

# What are the key trends in emerging markets?

- Wireless broadband benefits from an insufficient wired infrastructure
- Metropolitan areas is where most of the demand is
  - Subsidies are often needed in rural areas
- Business market is typically the most attractive one initially
  - The residential market is a great, mostly untapped opportunity for the longer term
- VoIP is often a key to attract customers
- Licensed spectrum is preferred and often required
  - Regulators are becoming more sensitive to the need for additional spectrum for wireless broadband
- Initial demand is mostly for fixed services
  - Portability and mobility will become important later

# Which version of WiMAX is better suited to emerging markets?

	<b>802.16-2004 WiMAX</b>	<b>802.16e WiMAX</b>
<b>Standard</b>	802.16-2004 (June 2004)	802.16e (a.k.a. 802.16-2005) (December 2005)
<b>Access</b>	Fixed, nomadic	Fixed, nomadic, portable and mobile
<b>Modulation</b>	OFDM	OFDMA
<b>Service providers targeted</b>	DSL and cable modem service providers, wireless and wired ISPs	Mobile operators, DSL and cable modem service providers, wireless and wired ISPs
<b>Subscriber unit</b>	Outdoor or indoor CPE, eventually PCMCIA card	Indoor CPE, PCMCIA card, mini-card built in laptops
<b>Certification start</b>	July 2005	2H2006
<b>Certified products</b>	January 2006	1H2007 (Expected)
<b>Commercial availability</b>	1H2006	2007 (Expected)

# Is 802.16e worth the wait?

## Deploy now 802.16-2004

- Faster time-to-market
- Less complex technology
- Comparable performance for fixed services
- Operators are not interested in mobility
- FDD required
- Unlicensed spectrum
- Business market

## Wait for 802.16e

- More advanced technology with better support for indoor coverage
- Plan to offer portable and mobile services
- TDD required
- Licensed spectrum below 3 GHz
- Residential deployments

**Within a few years, 802.16e is poised to dominate the WiMAX market for fixed, portable and mobile services**

# Concluding remarks

- The impact of WiMAX will be stronger in emerging markets
- Initial growth in WiMAX adoption is driven by demand for fixed services
- Network operators need to carefully assess the WiMAX opportunity
  - Realistic expectations should replace hype (and nay saying)
  - Business case heavily depends on specific market situation
- WiMAX will enable network operators to enter or to strengthen their position in the broadband access market
  - New services and applications
  - Improved coverage and performance

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