

*Broadband in general – fiber and wireless in particular
– continue to expand fast, worldwide.*

Broadband Penetration in the European Union: The Haves and the Have-Nots

Sixty four million people in the European Union now have broadband access, but the gap between the best and worst performers is widening, according to the latest Broadband Scorecard published by the European Competitive Telecommunications Association (ECTA, www.ectaportal.com/en). At the end of 1Q 2006, overall penetration, at 14.1 percent, was up by 5.5 million lines, an increase of 9 percent over the previous quarter.

Denmark tops the league with broadband penetration of nearly 30 percent, while Greece trails far behind at just 2 percent. Because the poorly scoring countries are not growing quickly enough to catch up, the gulf between connected and unconnected countries is widening. According to Steen Clausen, Managing Director of ECTA, countries that are performing relatively well, such as Denmark and the UK, have taken action to ensure choice and competition,

while broadband access in lagging countries such as Greece and Ireland is still largely dominated by the former state-owned incumbents.

Broadband subscribers in the UK increased 15 percent over the quarter, after regulatory action improved access conditions for competitors. Likewise, broadband in France stagnated until regulatory action paved the way for competition. Now, triple-play packages are available for less than €30 per month.

Ranking	Q1 2004	Q1 2005	Q1 2006
1	Denmark	Netherlands	Denmark
2	Netherlands	Denmark	Netherlands
3	Belgium	Finland	Finland
4	Sweden	Belgium	Sweden
5	Austria	Sweden	Belgium
6	Finland	France	UK
7	France	UK	France
8	UK	Austria	Luxembourg
9	Germany	Luxembourg	Austria
10	Portugal	Portugal	Germany
11	Spain	Italy	Italy
12	Italy	Germany	Spain
13	Luxembourg	Spain	Portugal
14	Ireland	Ireland	Ireland
15	Greece	Greece	Greece

Improving: Green • Steady: Blue • Declining: Red

Hardware Sales Demonstrate Continuing Broadband Boom

The broadband boom continued in the second quarter of 2006, says Infonetics Research (www.infonetics.com) in three new reports tracking the markets for broadband customer premises equipment (CPE), DSL aggregation hardware and cable-modem termination systems (CMTS).

Worldwide broadband CPE sales increased 5 percent to \$1.4 billion and DSL aggregation hardware sales increased 14 percent to \$1.8 billion. While CMTS sales dropped 18 percent to \$211 million on the heels of a blockbuster 30 percent gain in the first quarter, CMTS revenue is up 15 percent from the same time last year and is expected to post strong growth through 2009.

“The race to build out broadband access networks and sign up subscribers continues unabated,” said Jeff Heynen, directing analyst for broadband and IPTV at Infonetics Research. “The continued deployment of a wide range of CPE again points to the effort by providers to offer tiered services.”

The reports also concluded that:

- IP set-top box sales are up 89 percent from 1Q06, as more service providers begin volume deployments of IPTV.
- Worldwide voice CPE sales are up 10 percent, as more service providers opt for voice-enabled CPE.
- Worldwide DSL port shipments are up 8 percent between 1Q06 and 2Q06.
- VDSL continues to grow steadily, but at rates lower than previously forecast; ADSL and ADSL 2+ will serve as the primary access method for most subscribers.
- IP DSLAM sales are forecast to more than triple between 2005 and 2009, as they are increasingly deployed in new-build areas around the world, especially Asia Pacific.
- The number of worldwide DSL subscribers is forecast to reach 274 million in 2009.
- Worldwide CMTS port shipments increased, showing that cable operators continue to build out broadband networks in response to the competitive threat from FTTH and DSL deployments.
- The number of worldwide cable broadband subscribers is forecast to reach 71 million in 2009.

China Will Be Top Broadband Market by 2007

China will overtake the US to become the world's biggest broadband market in less than a year, according to consulting company Ovum (www.ovum.com). Over the last three years China's broadband sector has grown at an average of 79 percent, and it will reach 79 million subscribers by 2007.

But the growth opportunity is still huge. With a penetration rate of only 3.4 percent of the population, broadband penetration in China is well behind many countries in the Asia-Pacific region. Ovum says China's broad-

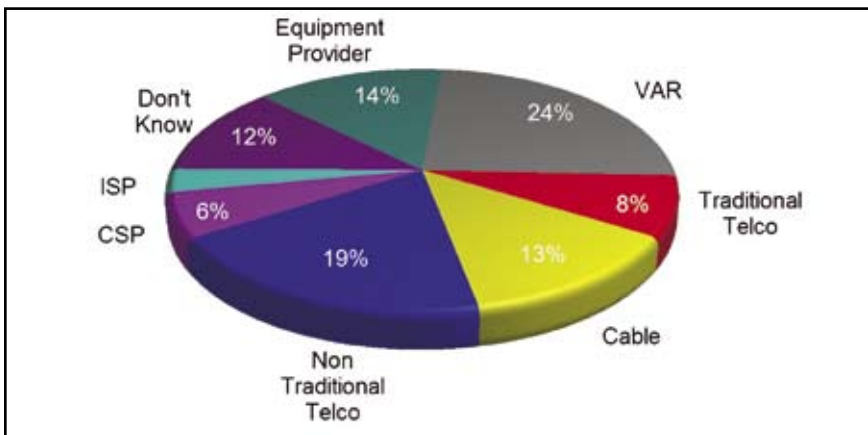
band sector will benefit from a booming economy, growing incomes, expanding PC penetration and new applications such as VoIP and IPTV, as well as from the Olympics, and will reach 139 million subscribers by 2010.

DSL is the fastest-growing access technology, with a market share of 71 percent and 32 million subscribers in June 2006. It is followed by Ethernet-based LAN access in high-density areas, which has a market share of 26 percent. Operators are upgrading the DSL network, using higher speed technology such as ADSL2+ and VDSL, to meet

increasing bandwidth demands.

Despite the 128 million cable TV subscribers in China, cable operators have made few inroads into the growing broadband market. Ovum believes that regulatory barriers, fragmented ownership structure and a lack of expertise have undermined cable operators' competitiveness, in contrast to the North American market. Wireless broadband is still at an immature stage but the emergence of VoIP is giving operators new hope for seeing returns on their wireless local area networks.

Small and Medium Businesses Would Buy VoIP – If They Only Knew Where

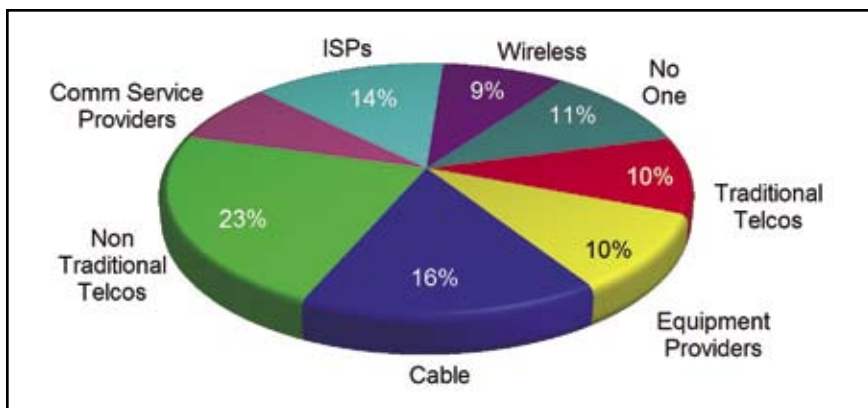


For people who have already purchased VoIP: From whom did you purchase your VoIP system?

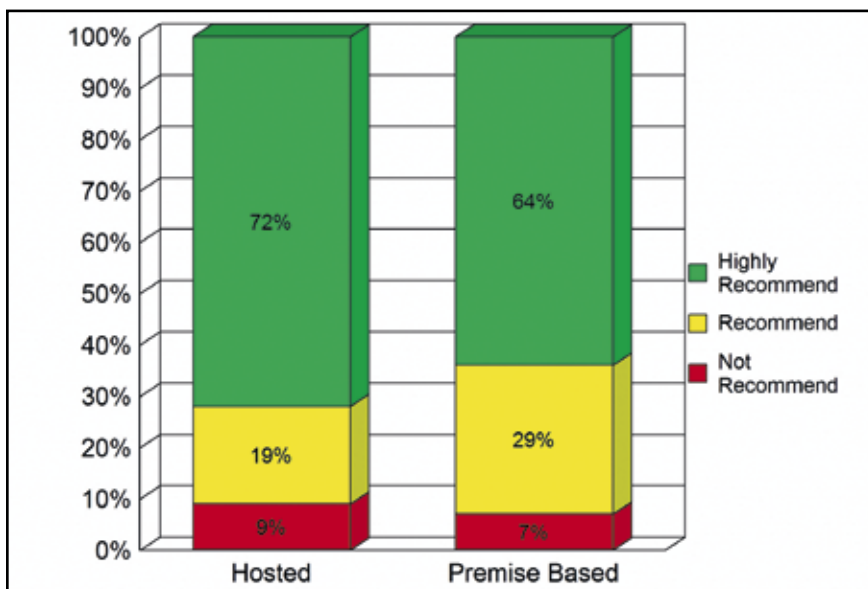
Small and medium businesses (SMBs) in the U.S. are enthusiastic about VoIP in spite of the difficulty of buying it, according to new research from telecommunications consulting firm Savatar (www.savatar.com) sponsored by Lucent Technologies, Level 3 Communications, Inc. and BroadSoft. SMBs that have deployed VoIP – 17 percent of companies surveyed, compared with 12 percent six months earlier – tend to be highly satisfied with it, would recommend it, and are interested in buying complementary services such as wireless. Those that haven't yet made the jump to VoIP are confused about what solution to buy and from whom to buy it; 70 percent of SMB decision-makers are unclear where to turn for the best VoIP options.

VoIP, mobile and fixed, can add more revenue to the bundle of services offered by telcos, making fiber more justifiable.

Providers are not taking advantage of SMBs' interest, according to John Macario, president of Savatar, who said: "Providers have a 'wait and see' attitude coupled with a quote process

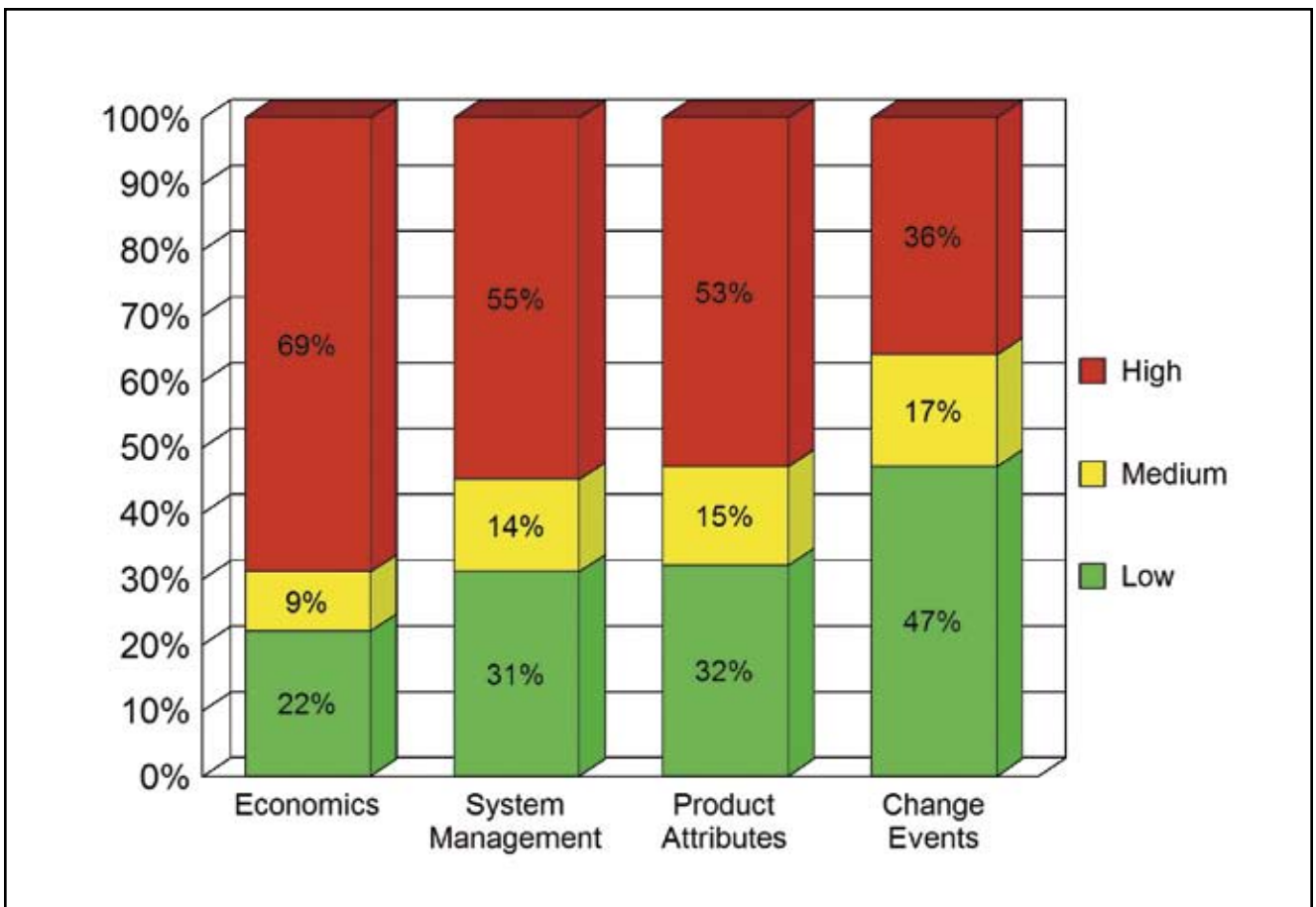
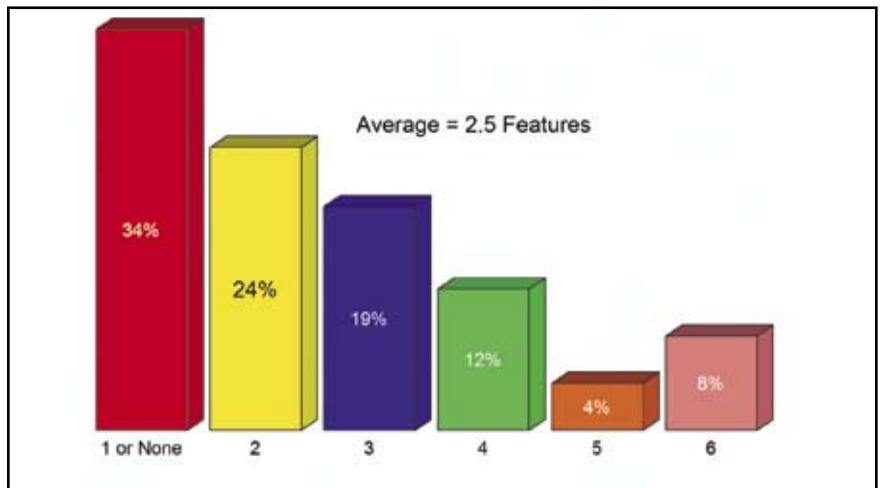


For people who have not yet purchased VoIP: Whom do you think of as a business VoIP provider?



For people who have already purchased VoIP: Would you recommend you new VoIP system to your business peers?

For people who have already purchased VoIP: Which of these features do you use?



For people who have not yet purchased VoIP: Which of the following are most important in your decision to switch to a new phone system?

that takes more than a month, and that's not helping them capture the market. SMBs need to be educated about the benefits of VoIP."

SMBs still have no preference for

a particular VoIP service provider. VARs, typically authorized partners of one of the equipment companies like Cisco Systems, Inc. or Nortel, are cited by 38 percent of the respondents.

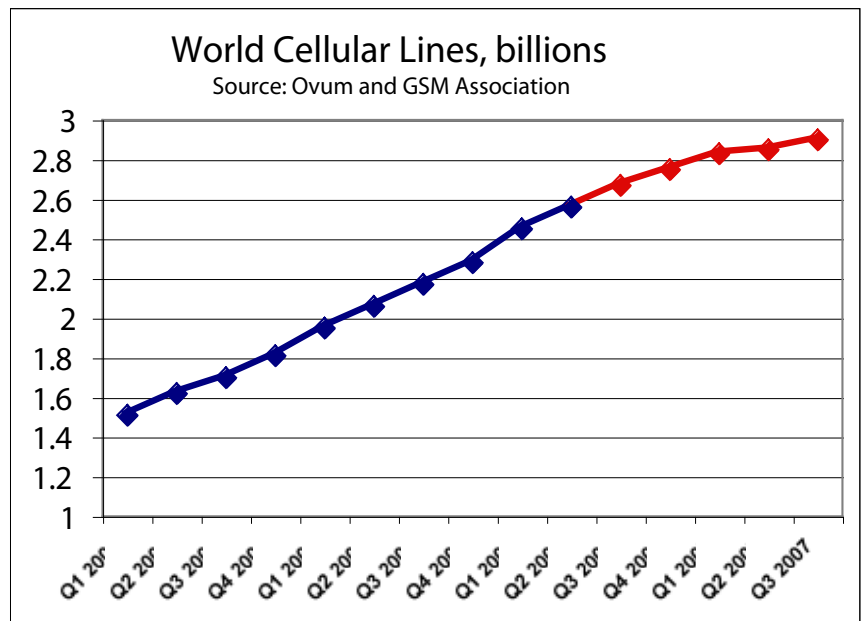
Non-traditional telcos, like Cbe-yond, accounted for 19 percent of purchases. No other type of provider, including incumbent telcos or ISPs, came close to these numbers.

Worldwide Cellular Connections Pass 2.5 Billion

The total number of cellular connections in the world has reached 2.5 billion, having passed the 2 billion mark just 12 months ago, according to estimates from Wireless Intelligence (www.wirelessintelligence.com), a research organization that is a joint venture between Ovum and the GSM Association. Worldwide growth is currently running at a record 40 million new connections per month. For telcos looking to gain customer revenue by adding mobile to justify higher bundle costs for a fiber buildout, the numbers are encouraging – even if providers are hoping the mobile will be WiMAX or WiFi VoIP rather than cellular.

The top ten countries for volume of new connections over the last year were China, India, Russia, USA, Pakistan, Ukraine, Brazil, Indonesia, Nigeria and Bangladesh. Among them, these countries account for over half of the growth in the world cellular market over the last 12 months.

A quarter of the growth is coming from China and India alone. China's market is still expanding at more than 5 million new connections per month. India has moved rapidly up the top ten



Although cellular lines have been growing almost linearly worldwide for the past few years, there is actually quite a bit of variation in growth rates – China and India have added the most lines recently. Blue represents actual data; red is the projection.

list, with the rate of new connections quadrupling over the last 18 months to reach a level very close to China's.

According to Wireless Intelligence forecasts, the next half billion new

connections will take a little longer to be added – 16 months – meaning that the market is on track to reach 3 billion connections around the end of 2007.

Real-Time Broadcast MPEG Encoder Market in Transition

Satellite and telco TV markets for real-time broadcast MPEG encoders are adopting the H.264 (MPEG-4 AVC Part 10) standard, and all other segments of the MPEG encoder market will soon follow suit, reports In-Stat (www.in-stat.com). The need to repurpose content for multiple screens – phones and iPod-class players as well as HDTV widescreen – is also driving encoder shipments, the research firm says. For example, content that is distributed

in MPEG-2 may be decoded and then re-encoded to H.264 in a mobile video system.

The encoder market is also being boosted by demand from one-time projects such as North American cable operators' move to digitally simulcast all of their analog channels. Another such project is the Broadcast Auxiliary Service (BAS) relocation project in the U.S., which will increase shipments from 2006 through 2009.

Highlights of the In-Stat report include:

- Worldwide MPEG video encoder revenue will increase from \$496 million in 2005 to \$555 million in 2010.
- The ongoing launch of HD broadcasts in Europe will boost shipments of HD H.264 encoders.
- Product evolution in H.264 is faster than it was for MPEG-2, as vendors rely on the knowledge they gained from MPEG-2.

WiMAX on Track to Compete for Dominance in Wireless Markets

WiMAX is on track to compete for mainstream wireless markets, says Maravedis (www.maravedis-bwa.com). According to the authors of a new report from the research firm, WiMAX's entry into the mainstream will be hastened by the introduction of multimode WiMAX-mobile-plus-cellular semiconductors and devices. To date, lack of spectrum has been the major barrier to mass market acceptance of WiMAX. Multimode opens up spectrum and also opens market access to hundreds of millions of existing wireless users. For incumbent service providers who have access to mobile spectrum, this can present an economically viable and more immediate path to 4G than 3G-LTE.

The report finds that:

- Service providers are examining fixed-mobile convergence as a way to reverse the decline of average revenue per customer (ARPU), and WiMAX is becoming the obvious choice to extend service offerings.
- In the medium to long term, service providers care about certification, standardization and economies of scale, but they want robust equipment with near-line-of-sight capabilities today.
- Outdoor WiMAX customer-premises equipment will be phased out in 2008, with indoor equipment representing the bulk of shipments.
- The cost of indoor customer-premises equipment will fall to \$75 by 2008, boosting the proliferation of WiMAX.
- The WiMAX equipment market is forecast to reach an annual \$140 million in 2006 and \$6 billion in 2012.



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