

Broadband Market Remains Strong Worldwide; DSL Giving Way to Fiber

IPTV deployments nearly tripled in the last year – and that’s only one of several factors making today’s broadband infrastructure obsolete, analysts say

PON Equipment Sales up 3%, Ethernet FTTH up 9% in 2Q07

Worldwide PON equipment sales, including BPON, EPON, and GPON, grew 3 percent in the second quarter of 2007, reaching \$396 million, says Infonetics Research (www.infonetics.com). According to Infonetics analyst Jeff Heynen, “The two biggest trends in the PON market right now are early merger and acquisitions activity in the GPON market amidst a lot of smaller vendors chasing a limited market in this space, and PON component suppliers aggressively

reducing costs at the request of equipment manufacturers. The component price slashing will result in a 33 percent drop in the price of GPON ONTs [customer premises equipment] over the next two years.”

Other report highlights:

- Asia Pacific’s share of worldwide PON revenue will decline rapidly starting in 2008 as Verizon, AT&T, France Telecom, and Telefonica GPON deployments hit volume, but will still lead re-

gional share overall, followed by North America, then EMEA.

- Tellabs maintains its strong lead in BPON revenue market share in 2Q07, with 85 percent; the two closest competitors are Motorola and Hitachi.
- Mitsubishi leads in the EPON market, followed by Sumitomo.
- After 5 quarters of high double-digit sequential gains, sales of worldwide Ethernet FTTH equipment increased 9 percent in 2Q07, hitting \$88 million.

Broadband Equipment Rapidly Becoming Obsolete

Increases in broadband speeds are hastening the obsolescence of broadband investment, according to a new report by Technology Futures, Inc. (TFI, www.tfi.com). The report provides recommendations for depreciation lives for broadband equipment such as video set-top boxes, headend equipment and broadband loop electronics, including DSLAMs, DSL modems and BPON equipment. The research was sponsored by the Telecommunication Technology Forecasting Group, a consortium of telephone companies comprised of AT&T, Bell Canada, Qwest, and Verizon.

Report author Dr. Lawrence Vantson states, “The business of incumbent local exchange carriers (ILECs) is transitioning from primarily voice to primarily high-speed broadband and video. This means that equipment devoted to delivering broadband and video will come to dominate the useful investment of ILECs. Much of this equipment is significantly different than traditional narrowband equipment and, thus, may have different depreciation lives.”

Key findings include:

- The required data rate for broadband is increasing rapidly, caus-

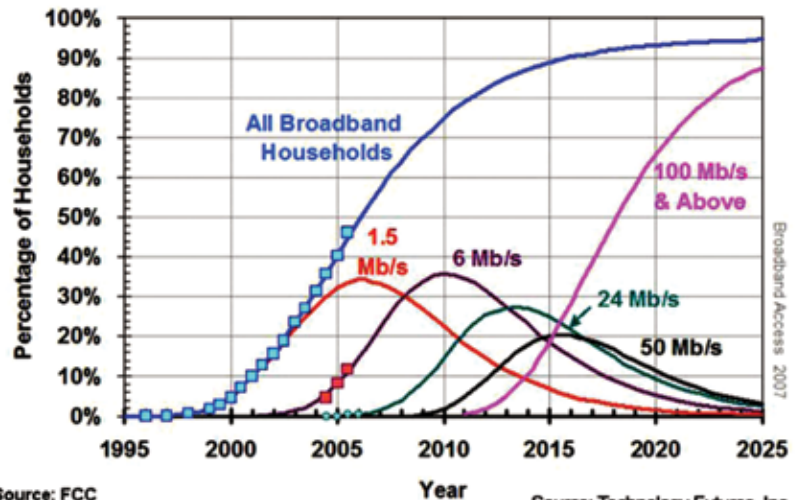
ing rapid obsolescence of broadband equipment. By 2010, about 75 percent of US households will have broadband service, and over 15 percent of households will subscribe to very high-speed broadband (at least 24 Mbps).

- New video services such as IP video, Internet television, and HDTV are rapidly being adopted and improved. This will cause significant obsolescence of broadband equipment.

The ILEC business is transitioning from primarily voice to primarily high-speed broadband and video.

- The broadband, voice and video networks are moving toward the IP paradigm, meaning less expensive equipment, rapid obsolescence and marked volatility in applications, services and network requirements.
- In each of the broadband architectures currently being deployed, significant amounts of active electronics are exposed to the elements (either on the side of a house or at a remote node) or to household activity. This will reduce depreciation lives.

Broadband Households by Nominal Data Rate*



Data Source: FCC

*Note 1: Total broadband households exclude mobile wireless broadband.
 Note 2: Data Rate percentages are based on DSL and fiber access technologies only.

Source: Technology Futures, Inc.

FCC: High-Speed Connections to the Internet Increased by 61% in 2006

The Federal Communications Commission (FCC, www.fcc.gov) says that high-speed lines in the US – by its definition, any access lines faster than 200 Kbps downstream – increased by 61 percent, to 82.5 million from 51.2 million, in 2006, compared with 37 percent in 2005. About 71 percent of these lines served primarily residential end users. Cable modem service accounted for 53.6 percent of these lines, while 39.3 percent were DSL connections, 1.3 percent were fiber-to-the-premises, and 5.8 percent used other types of technology including satellite, wireless or electric power line.

Although ADSL grew faster than cable for the year as a whole (adding 5.9 million lines versus 5.5 million for cable), cable began growing faster at some point during the year; during the second half of the year, there were 3.2 million cable lines added compared with 2.8 million for DSL.

US High-Speed Lines by Speed, Year-End 2006

Technology ²	Exceeding 200 kbps in only one direction	Exceeding 200 kbps in both directions, and:				
		Greater than 200 kbps and less than 2.5 Mbps in the faster direction	Greater than or equal to 2.5 Mbps and less than 10 Mbps in the faster direction	Greater than or equal to 10 Mbps and less than 25 Mbps in the faster direction	Greater than or equal to 25 Mbps and less than 100 Mbps in the faster direction	Greater than or equal to 100 Mbps in the faster direction
ADSL	4,268,821	12,433,916	8,698,277	13,973	*	*
SDSL	31	343,654	792	*	*	0
Traditional Wireline	897	649,547	14,604	1,448	13,675	7,100
Cable Modem	387,594	3,757,915	25,533,788	*	*	0
Fiber	1,360	239,020	431,002	326,774	19,121	12,842
Satellite	535,954	36,026	0	0	0	0
Fixed Wireless	28,564	433,066	21,842	244	*	*
Mobile Wireless	17,796,941	*	*	0	0	0
Power Line and Other	0	*	*	0	*	0
Total Lines	23,020,162	22,009,596	34,702,025	2,717,861	76,842	21,165

* Data withheld to maintain firm confidentiality.

Source: FCC

Note that the majority of the over-100 Mbps lines are FTTP.

Advanced services lines, which deliver services at speeds exceeding 200 Kbps in both directions, increased 36

percent over the year, to 59.5 million from 43.9 million. Of the 59.5 million advanced services lines, 63 percent

were at least 2.5 Mbps in the faster direction. About 90 percent of advanced services lines served primarily residential end users.

The FCC estimates that high-speed DSL connections were available to 79 percent of the households to whom incumbent LECs could provide local

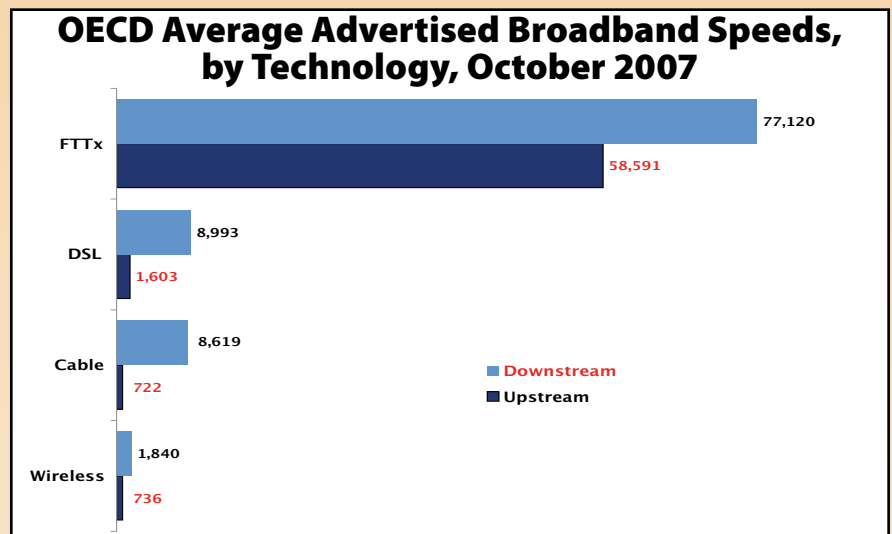
telephone service as of December 31, 2006, and that high-speed cable modem service was available to 96 percent of the households to whom cable system operators could provide cable TV service. Broadband access was available in more than 99 percent of

Zip Codes, though not necessarily at all locations throughout the Zip Code.

The FCC's use of the 200 Kbps standard for high-speed access has been criticized as obsolete, and the agency says it is considering whether to maintain this standard.

OECD Ranks Broadband Technologies by Speed

Data recently released by the Organisation for Economic Co-operation and Development (OECD, www.oecd.org) shows the relative speeds of different broadband access technologies in advanced economies. (OECD members include 30 countries in North America, Europe and Asia/Pacific.) Fiber-to-the-premises providers, on average, offer both faster and more symmetrical connections than those for any other technology. Cable and DSL connections had similar download speeds, but DSL upload speeds are higher. Wireless broadband offers the lowest download speeds, with upload speeds similar to cable.

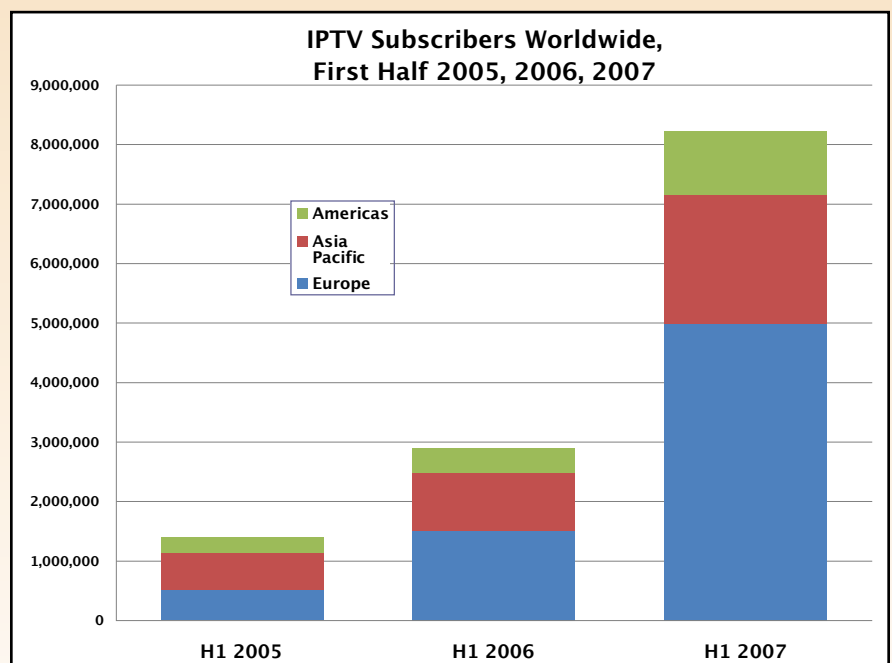


IPTV Deployments Almost Triple in a Year

The number of people using IPTV services increased by 179 per cent in the year ending June 30, 2007, according to statistics prepared by industry analyst Point Topic (www.point-topic.com) for the DSL Forum (www.dslforum.org), an industry consortium.

More than 8 million people are now connected to IPTV services. Europe added over 3 million subscribers, making it the strongest market both in terms of growth (231 per cent in 12 months) and total subscribers (almost 5 million).

“Top markets like France (2,550,000 customers) and Hong Kong (938,000 customers) show that IPTV can be deployed rapidly to large numbers of subscribers, if the market conditions are right,” says Point Topic Senior Analyst John Bosnell. “On the demand side, competitive and clear bundle pricing and



Source: Data provided for the DSL Forum by Point Topic

The global market share of broadband technologies remained largely unchanged from December 2006, with almost 22 per cent of subscribers using cable, and just over 10 per cent using FTTx. DSL remains the most widespread broadband access technology.

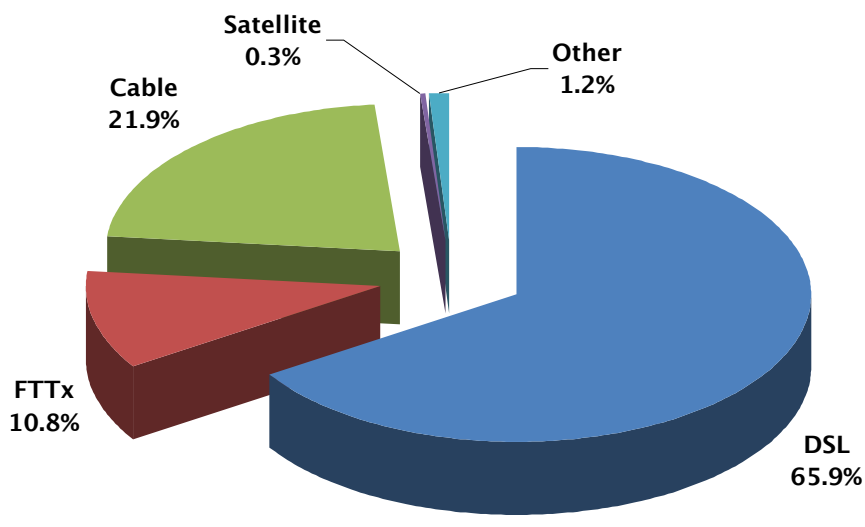
content deals will help to attract customers to IPTV services, while on the supply side, making IPTV easier to install and develop will help to deliver IPTV services to a wider subscriber base. Developing and agreeing standards will help to simplify the delivery process and drive higher take-up in other markets, too.”

“Services such as IPTV, which have held the promise of increased revenues and reduced subscriber churn for a number of years, are finally becoming a reality for millions of people,” notes Robin Mersh, chief operating officer at the DSL Forum.

Point Topic also found that DSL remains the most widespread broadband access technology, with more than 200 million of the world’s 313 million broadband subscribers. The global market share of broadband technologies remained largely unchanged from December 2006, with almost 22 per cent of subscribers using cable, and just over 10 per cent using FTTx.

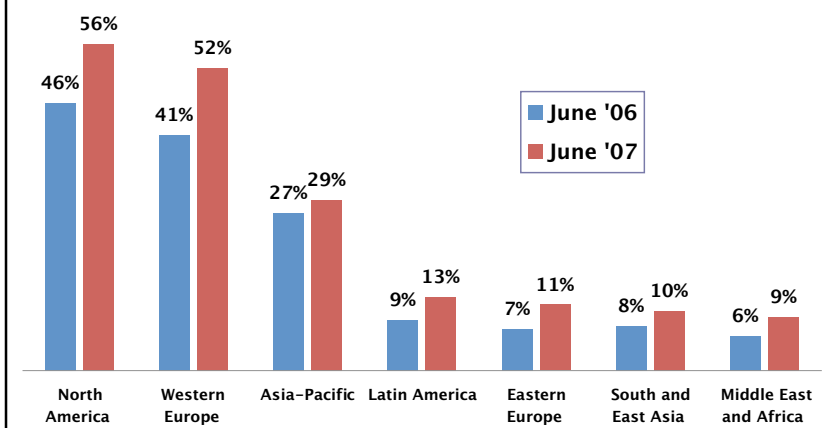
The Eastern Europe DSL market, while small (less than 14 million), shows the strongest growth – over 60 per cent in the 12 months ending June 30, 2007. The US has the most broadband subscribers (over 63 million), but China tops the DSL subscriber list with over 44 million of its 59 million broadband users connected via DSL.

Leading Broadband Access Technologies, June 30, 2007

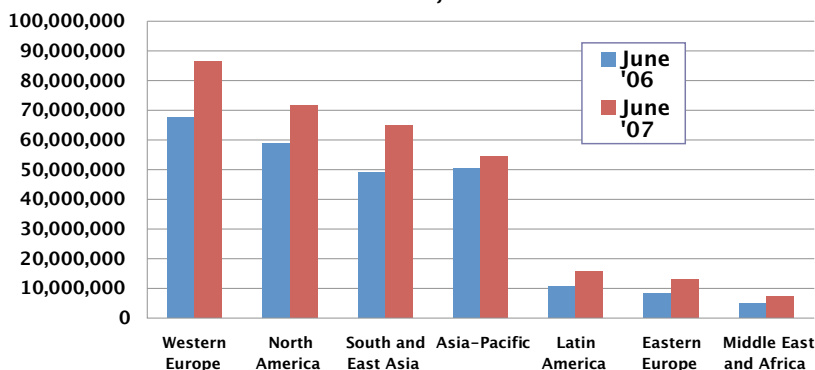


Source: Data provided for the DSL Forum by Point Topic

Growth in % Broadband Households, 2006-7

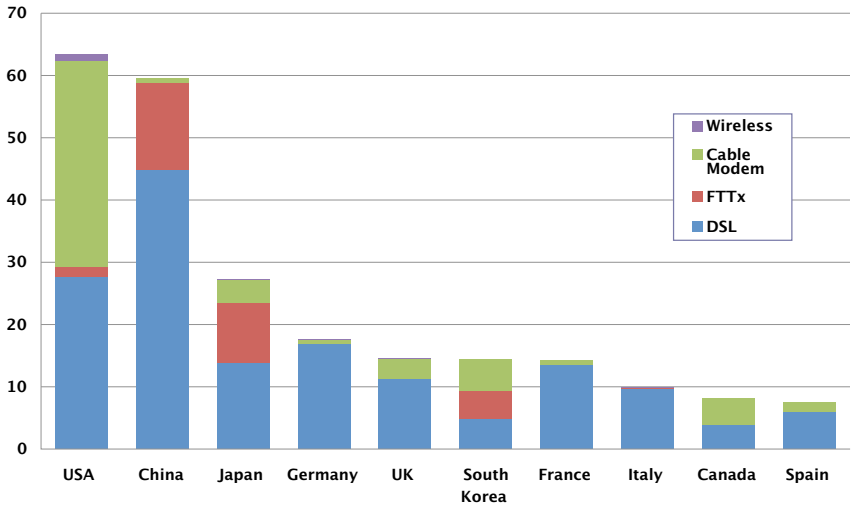


Growth in Actual Broadband Households, 2006-7



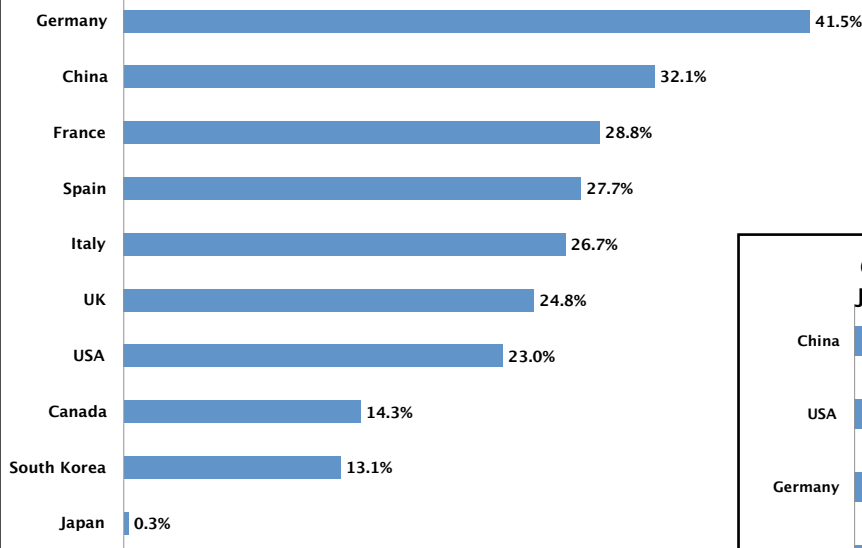
Source: Data provided for the DSL Forum by Point Topic

Broadband Households by Country, June 2007, Millions

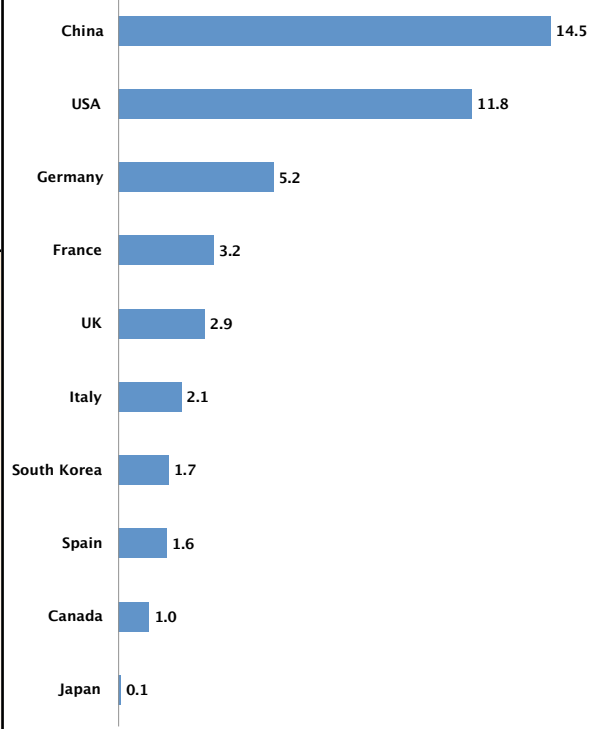


More than 8 million people are now connected to IPTV services. Europe added over 3 million subscribers last year, making it the strongest market both in terms of growth (231 percent in 12 months) and total subscribers (almost 5 million).

% Growth, Broadband Households, June 2006 to June 2007



Growth, Broadband Households, June 2006 to June 2007, Millions



Source: Data provided for the DSL Forum by Point Topic

Top markets like France (2,550,000 customers) and Hong Kong (938,000 customers) show that IPTV can be deployed rapidly to large numbers of subscribers, if the market conditions are right.

Triple Play Bundles Work; Quadruple Play Not Proven

Experience in France, the UK, the US and other countries demonstrates that triple play bundles of TV, voice and broadband services have proven themselves as a means of increasing market share, according to a new report, *Quadruple-Play Bundling Strategies*, published by Analysys (www.analysys.com). Triple play packages have enabled US cable operators to double ARPU and halve churn, says Analysys, while, in France, competitive providers with low-price packages offering high broadband access speeds, free landline calls to 50 countries and IPTV services have found a very receptive market.

“There is plenty of evidence that TV-based triple play bundles work,” says the

report’s author, Margaret Hopkins. “But quadruple-play packages suffer from the mismatch between the elements’ target markets: TV services are targeted towards families, but mobile phone services are aimed towards individuals. Incumbent operators have used quadruple play services as a defense against competitors’ TV-based triple play bundles, but without noticeable success.”

Key findings from the new report include:

- Not all markets are ready for a quadruple play strategy – multi-play bundles tend to be introduced in maturing markets with fewer opportunities for innovation.

- Quadruple play packages are inevitable despite the lack of certainty about their success, and residential broadband and pay-TV operators must plan now to be ready for their introduction.
- Implementing a successful quadruple play bundle is challenging because they are difficult to design and market. In addition, it will be difficult to use them to create new sources of revenue – for example, from advertising or value-added services – because these services will require major software development projects.

Rural Telcos Turn to Fiber

A new report from Frost & Sullivan (www.frost.com) finds that rural telcos in the United States are responding to increased competition by upgrading their networks for delivery of video services. Although nearly all of these telcos offer broadband services and several have deployed IPTV over DSL, an increasing number are looking

at triple play over fiber, with GPON as the preferred access technology. A key source of funds for these telcos is the US Department of Agriculture’s \$2 billion broadband loan program. Participating in the transformation of these telcos are network equipment vendors and a few dozen consulting engineering firms.

“While a large number of rural telcos favor delivering a triple play using the more conservative fiber-to-the-node strategy, there is reason to suspect that an increasing number of these telcos are looking at a far more aggressive fiber-based play,” notes the author of the report. “This has created opportunities for vendors, particularly Tier 2 vendors.”

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