

**FOCUS: Fiber penetration growing worldwide;
OECD shows importance of government policies**

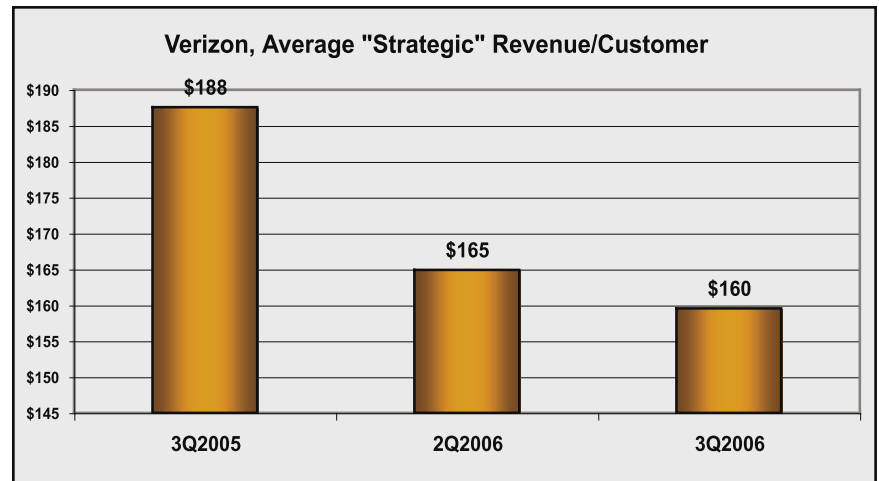
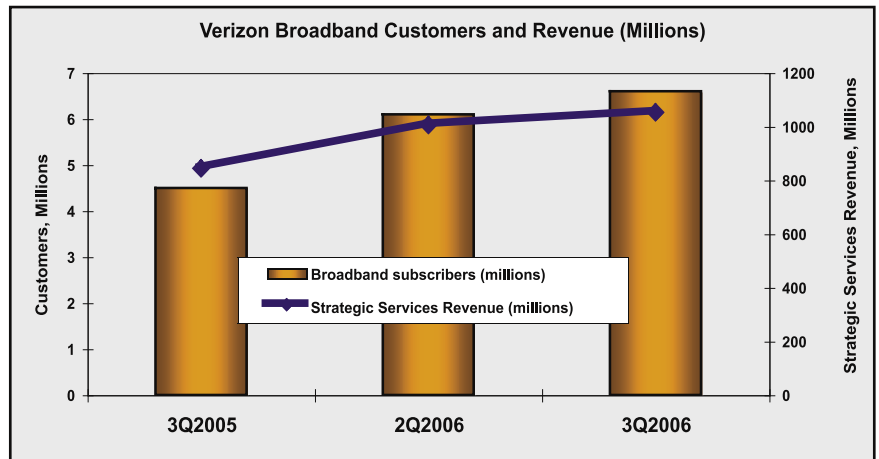
Verizon's FiOS Deployment Pays Off

Customer take rates for FiOS services are meeting expectations and the deployment will be cash positive in 2009, Verizon told investors and analysts in September. More evidence for the success of its massive FTTH deployment appeared in the company's recent quarterly financial report.

Verizon Communications is in the process of deploying triple-play services over fiber-to-the-home in over half of its service footprint – by far the largest FTTH deployment, existing or planned, in the United States. By the end of 2010, it plans to pass 18 million premises with its fiber network -- more than 50 percent of the approximately 33 million households in the company's 28-state wireline service area. The total buildout is slated to cost \$18.0 billion in net capital, plus \$4.9 billion that would have been needed to maintain the existing network. The buildout is on target to pass 6 million premises by the end of this year, with an additional 3 million a year planned through 2010.

Some industry analysts have criticized Verizon's strategy, saying that the cost of bringing fiber all the way to the home is not justified by the value of additional bandwidth to consumers. And it's true that in the short term, the FiOS deployment is depressing earnings – by 9 cents per share in the third quarter and an estimated 31 to 32 cents per share for the full year.

But Verizon says that its investment will pay off relatively soon. The company argues that the next-generation applications that fiber makes possible give FiOS a strong competitive advantage over rival networks; that fiber networks' low operating costs make up for much of the capital cost disadvantage; and finally, that the capital costs of installing fiber are falling. In addition, it says, the overall growth of the broadband market and consumers'



In the past four quarters, Verizon's broadband customer base has grown by almost 50 percent, from 4.5 million to 6.6 million. Quarterly revenues from "strategic services" such as IP, VPN, security, managed-network data, hosting, Ethernet and ring services (excluding dial-up) grew from \$844 million to \$1.053 billion. But per-customer revenue declined as the revenue mix continued to shift toward data services.

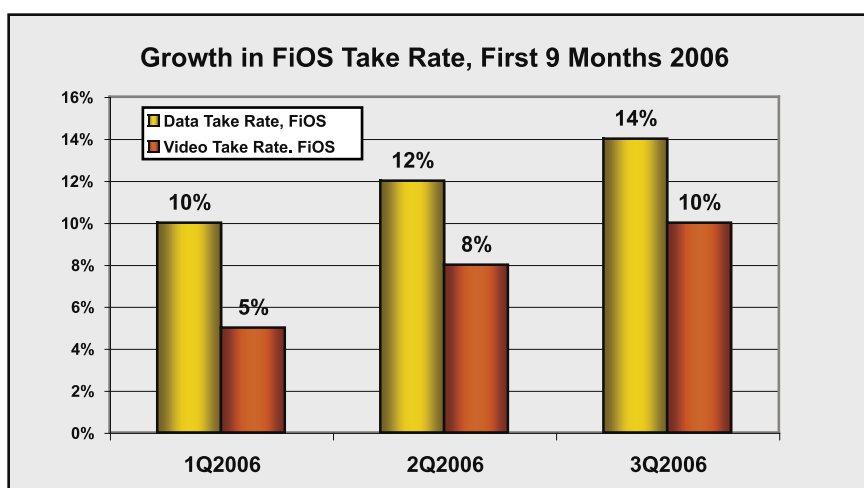
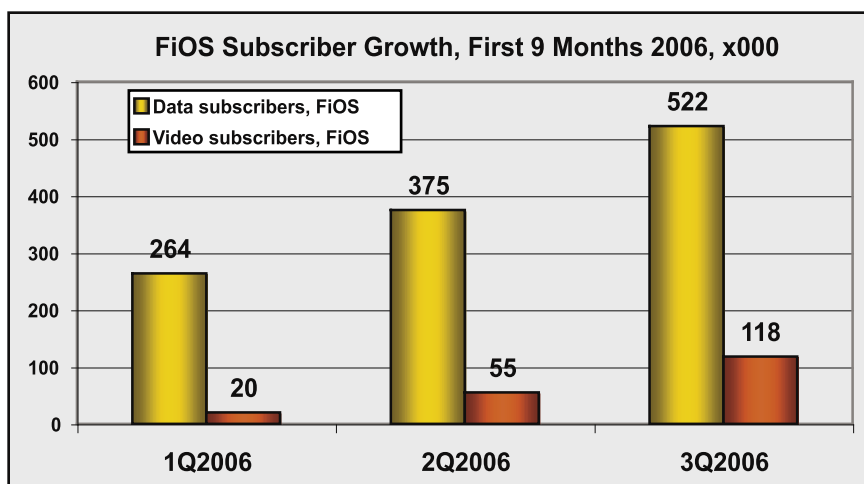
desire for a choice among video providers are working in Verizon's favor. (Verizon is running FiOS advertisements with slogans like "All I want is to kiss cable goodbye.")

The company expects FiOS revenues, combined with declining operational costs due to fiber efficiencies, to generate positive operating income beginning in 2009. When depreciation and amortization are included along with operat-

ing income, the total fiber investment is expected to be profitable in 2008. These projections are based on expectations of attracting up to 7 million FiOS Internet customers and up to 4 million FiOS TV customers by year-end 2010.

Internet and Video Services Gaining Acceptance

FiOS Internet service is currently available



FiOS take rates have improved even as the pace of homes open for marketing of FiOS has accelerated. By 3Q 2006, 3.8 million homes were being marketed for data, and 1.2 million for video.

at download speeds as high as 50 Mbps (slated to rise to 100 Mbps) and upload speeds of up to 10 Mbps. It is more competitively successful than Verizon DSL service; approximately 70 percent of FiOS Internet subscribers are new Verizon broadband customers. As the Internet service is rolled out to new markets, penetration rates have averaged 12 percent at nine months post-rollout and 15 percent after the first year. Monthly churn rates have averaged less than 1.5 percent – basically about the rate that people move and change their address.

By the end of the third quarter there were 522,000 FiOS Internet customers, with an overall average penetration rate of 14 percent; by the end of the year, Verizon expects 725,000 with an overall penetration rate of 15 percent. By 2010, its goal is to have a 35

to 40 percent penetration rate.

FiOS TV was launched in its first market just a year ago, and its rollout has been slowed by the need to obtain local franchises in many states. By the end of the third quarter 2006, there were 118,000 FiOS TV customers, two-thirds of whom had discontinued their cable TV service. The market penetration rate was just under 10 percent.

For year-end 2006, Verizon was targeting 175,000 FiOS TV customers, representing a market penetration rate of approximately 10 percent. By 2010, Verizon's goal is for FiOS TV to have a market penetration rate that ranges from 20 percent to 25 percent of approximately 15 million households.

Nearly 80 percent of FiOS TV customers have purchased the three "triple

play" services – voice, data and video – from Verizon. Monthly churn rates have mirrored those of FiOS Internet, less than 1.5 percent.

Applications Create a Competitive Edge

It takes applications to sell broadband; consumers don't pay for ultra-high-speed access just to surf the Web. Verizon says it expects FiOS speeds to attract customers who are interested in interactive gaming, educational, telemedicine, security and other applications, and it is working to make sure these services are available to consumers. As we have detailed in previous issues, it has already introduced its own gaming service and may resell other Internet applications as well.

FiOS TV enhancements expected in 2007 include a TV portal, home shopping and interactive broadcasting, gaming, and on-demand and multimedia enhancements. Among terrestrial TV providers, Verizon is already first in the number of national high-definition channels it offers, and in the percentage of customers with digital service. But its standard TV service is delivered as RF right now, not as IPTV.

In the future, FiOS also offers opportunities for convergence with Verizon Wireless and for interactive services such as intelligent media search, interactive advertising and personal broadcasting.

Operating and Capital Costs

Verizon officials say it expects to realize savings of approximately \$1 billion in annual, ongoing operating expenses by 2010 as a result of the efficiencies gained from fiber network facilities.

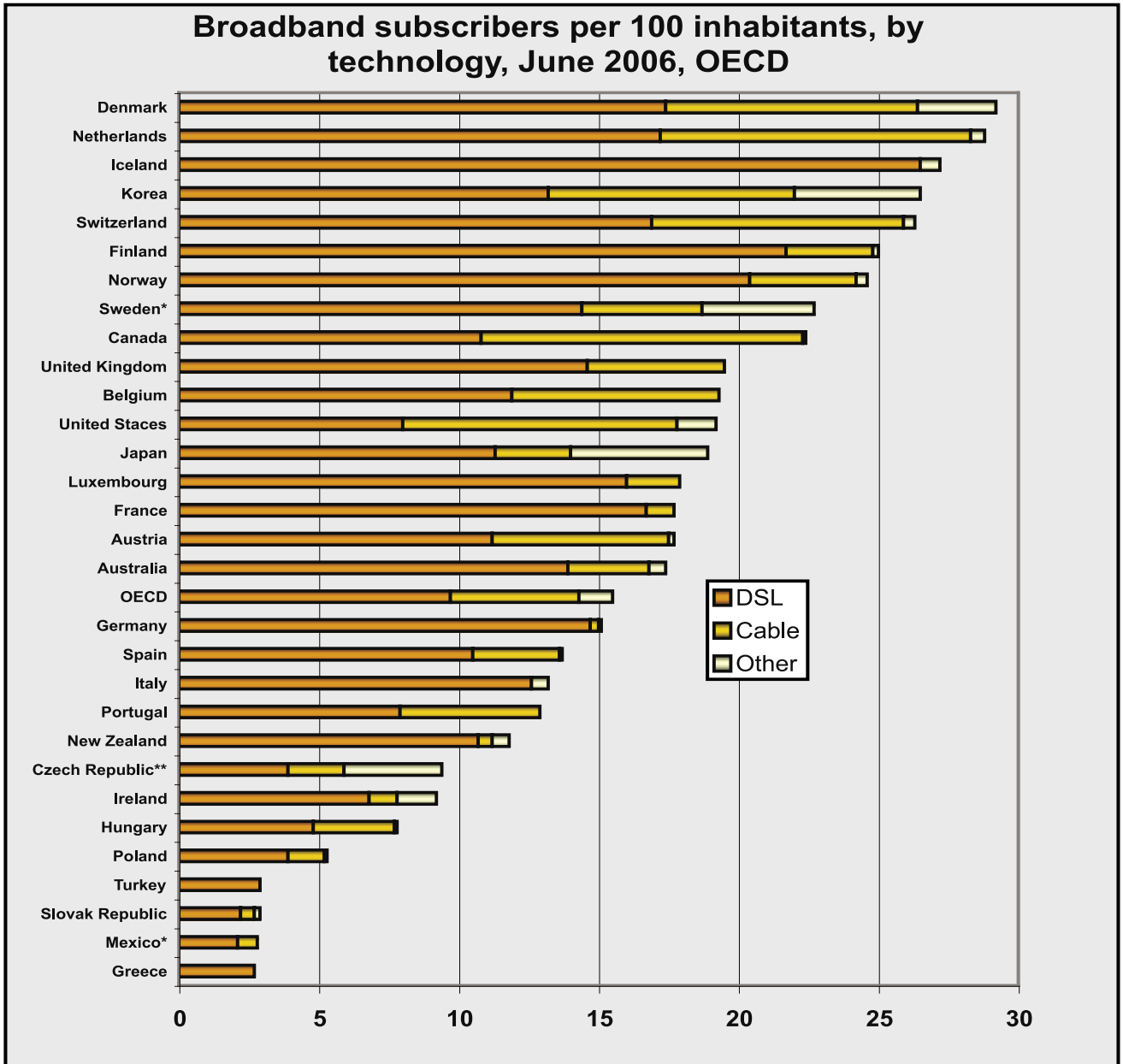
Capital costs continue to fall. In August, average capital expenditures for Verizon to pass a home with fiber were \$873, and they declined to \$845 in September, already below the year-end target of \$850. Expenditures to connect a home declined from \$1,220 in January 2006 to \$933 in August and \$900 in September, with a year-end target of \$880. By 2010, Verizon expects costs of \$700 to pass a home and \$650 to connect it.

United States Is #12 in Broadband Subscriber Rate, Says OECD

The OECD's (www.oecd.org) most recent broadband statistics, covering the year ending June, 2006, found the U.S. twelfth in the number of broadband subscribers per capita.

Even though the U.S. has the highest absolute number of subscribers in the OECD – 56 million – its per capita subscription rate is two thirds that of Denmark. Denmark, the Netherlands,

Iceland, Korea, Switzerland and Finland all have at least 25 subscribers per 100 inhabitants, compared to 19 in the U.S. Fiber to the home is becoming in-



The US ranking among 30 OECD nations rose from 16th to 12th in percentage of households subscribing to broadband services as of June 2006. In sheer number of subscribers, however (56 million), the US broadband market was more than double that of the next-highest country, Japan. Data for Mexico and Sweden are preliminary estimates. The OECD statistics for the “Other Broadband” category of the Czech Republic include a large number of fixed wireless broadband connections provided over mobile networks.

KILLER APP EXPO 7 CONFERENCE

Experiencing the Possibilities of Broadband

Killer App Magazine

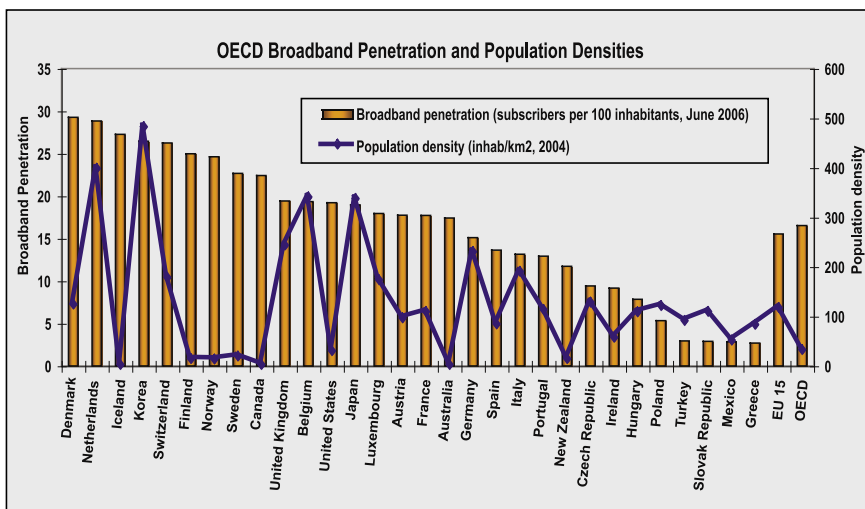
(online at KillerApp.com) is the leading source of information about new applications that take advantage of broadband and ultrabroadband networks, and about the impact of those applications on communities and individuals.

We keep readers up to date with news and insights about network applications that promise to change the way we live, work and play, and we tell you how consumers, businesses, educators, government agencies and others are using these applications today to enhance lives and increase opportunities.

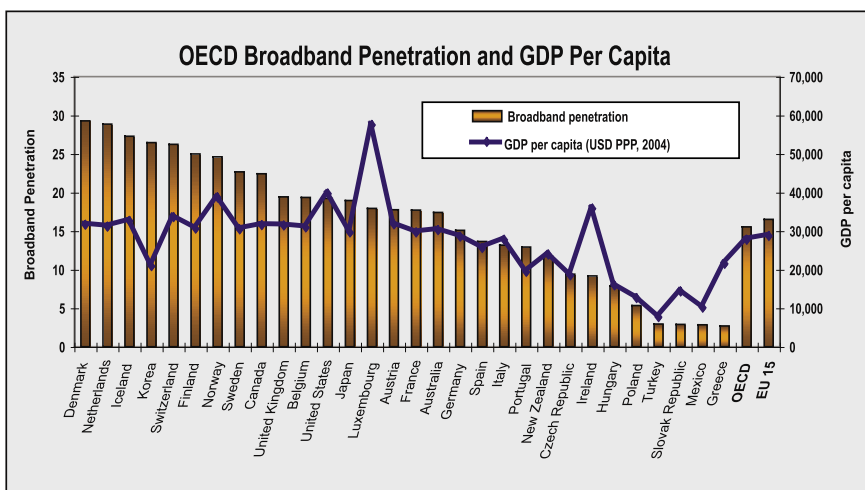
“Nobody’s building fiber for the sake of building fiber. It’s what fiber enables that we’re all so interested in.”

– The editors of Killer App

For more information visit us at www.killerapp.com



There is no correlation between population density and broadband penetration among OECD nations, although the more densely populated areas of all countries have the most broadband.



Among poorer nations, there is a correlation between per capita income and broadband use. But among wealthier nations, the key variable is not wealth but government policy.

creasingly important throughout the OECD, particularly in countries with high broadband penetration. Danish power companies are rolling out fiber to consumers as they work to bury overhead power lines. Municipal broadband projects are also expanding in many northern European countries and throughout the OECD. Telecoms in several OECD countries have also begun or announced large fiber-to-the-premises rollouts.

Japan leads the OECD in fiber to the premises with 6.3 million subscribers.

Fiber subscribers alone in Japan outnumber total broadband subscribers in 22 of the 30 OECD countries.

In Korea and Japan, the total number of ADSL subscriptions have continued to decline as more users upgrade to fiber-based connections.

The total breakdown of broadband technologies in June 2006 is as follows:

- DSL: 63 percent
- Cable modem: 29 percent
- Other technologies, including FTTH: 8 percent

Sales of Passive Optical Network Equipment Surge

Worldwide sales of EPON, GPON, and BPON equipment will surge to \$3 billion in 2009, up 432 percent from \$565 million in 2005, says Infonetics Research (www.infonetics.com) in its latest *PON, FTTH, and EAD Equipment* report. The number of PON subscribers worldwide will also swell from 4.1 million in 2005 to 38.0 million in 2009 – after more than doubling between 2004 and 2005. Infonetics' sunny forecasts reflect the increasingly long-term contracts that RBOCs and public telecoms have been initiating for fiber-to-the-home equipment.

According to Jeff Heynen, analyst at Infonetics Research, demand for FTTH is being driven by video (both RF-overlay and IPTV), gaming, and other high-bandwidth applications.

Mitsubishi, which is shipping EPON equipment to Japan-based service provider NTT, takes over from Hitachi as the leader in 2005 worldwide PON revenue and port market share; Tellabs is second in worldwide revenue; Suminet is second in ports shipped and third in revenue. In North America, Tellabs leads in PON revenue.

Telcos, Cable TV Juggle Bandwidth vs. Costs

Telephone companies face a delicate balancing act as they weigh the benefits and costs of new technology, says Kagan Research (www.kagan.com), which found that installing fiber-to-the-home in 2006 costs \$1,650 per household connected. In comparison, cable companies spend just \$470 per household connected to upgrade their hybrid fiber coax networks, while upgrading to fiber-to-the-node costs about \$600 per connected household. These types of networks use optical fiber for the backbone and coaxial cable and copper wire, respectively, for connections to homes.

The disparity between cable operators and telcos in part reflects how much they have already modernized their networks. The phone companies are early in the upgrade cycle, while cable operators have just wrapped up a 10-year cycle.

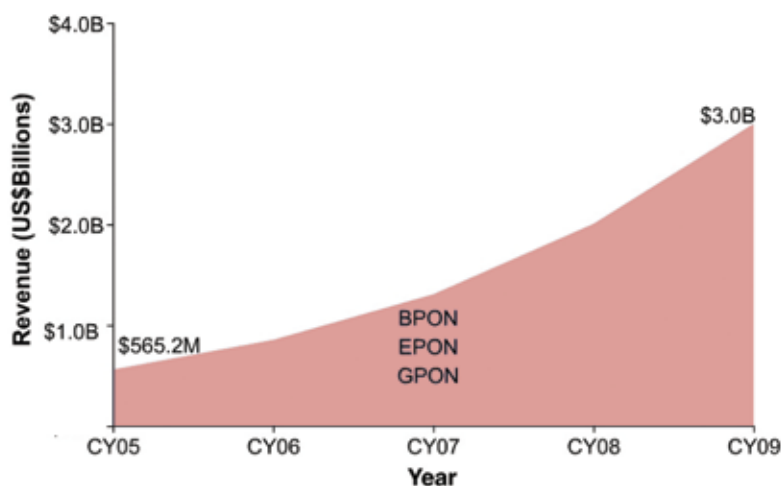
Furthermore, relative prices will change as fiber infrastructure expenses drop. Kagan forecasts a 15 percent annual decrease in fiber costs in coming years.

In-Stat: Broadband a Must-Have Service

Rich and poor, young and old, Easterners and Westerners all call broadband "the communication service they can least live without," reports In-Stat (www.in-stat.com). The company's survey of consumers in the U.S. and Canada found that broadband households were diverse in terms of lifestyle, interests, activities and buying behavior – but all of them wanted their broadband.

Not that they didn't want other communications services, too. Eighty-five percent of respondents favored a quadruple-play bundle. In addition, the survey found that 72 percent of all leading-edge broadband households in North America already have a cable service bundle. "Me-Too" services will not be enough to win away these consumers, In-Stat warns.

Worldwide PON Equipment Manufacturer Revenue



Why We Need Fiber

Attempts to throttle the demand for bandwidth – especially where college students are involved – seem to be an exercise in futility. The Pennsylvania State University Collegian reported recently that in spite of the university's decision to raise the weekly traffic allocation from 1.5 gigabytes to 2 GB, students have been exceeding Internet bandwidth limits at the same rate that they were last year. The weekly allocation might have to be raised yet again, university officials say.

KILLER APP EXPO CONFERENCE

Come to the
Killer App
Conference and Expo
to learn about the
applications that are:

EMPOWERING
companies to build their
businesses and boost local
economies

ENABLING efficiencies,
community involvement,
and security at
government agencies

EXPANDING research
and educational
opportunities to pave
the way for tomorrow's
applications

IMPROVING the quality
and extending the reach
of healthcare services

For more information visit
us at www.killerapp.com

IPTV Still in 'Kick the Tires' Phase – But Not for Long

"IPTV is still in the 'kick the tire' phase, with service providers doing trials rather than mass deployments, but there's no question that IPTV is going mainstream," says Jeff Heynen, directing analyst for Broadband and IPTV at Infonetics Research (www.infonetics.com) and lead author of the new *IPTV Equipment, Services, and Subscribers* report.

While IPTV must overcome many challenges before it goes mainstream, many of those challenges will be overcome soon enough for the number of subscribers to more than double just about every year from 2005 to 2009, when they will reach 68.9 million subscribers. Service revenue and service provider capex will also increase dramatically, and sales of IPTV equipment will skyrocket – from \$371

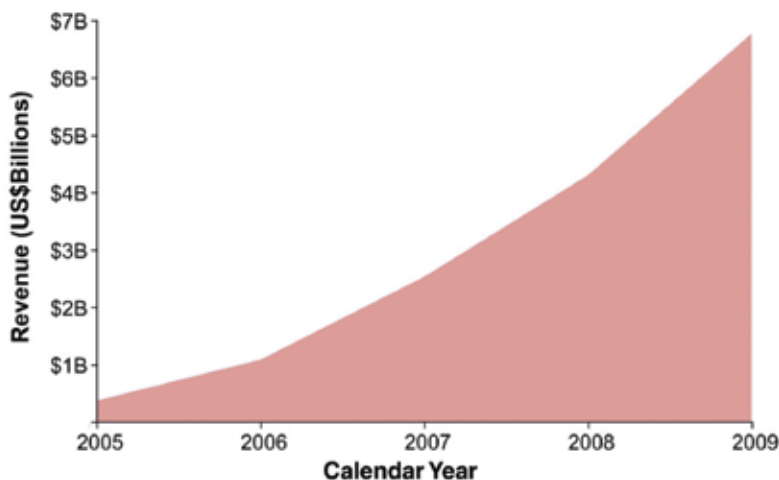
million to \$6.8 billion – between 2005 and 2009.

But because the technical and regulatory hurdles in IPTV's path have created a "5,000-piece puzzle," Heynen says, the timeline for IPTV's takeoff is still somewhat uncertain.

Infonetics' best guess is that:

- Service providers will generate significant IPTV service revenue between 2005 and 2009, with worldwide revenue increasing at a 169 percent five-year compound annual growth rate.
- Worldwide IPTV capex will grow at 41 percent annual clip between 2005 and 2009.
- The number of IP set-top boxes (STBs) sold worldwide will nearly triple between 2006 and 2007.

Worldwide Total IPTV Equipment Revenue Forecast



IGI: High-Speed Access Market Saturated by 2010

The most recent high-speed forecast from Information Gatekeepers (www.igigroup.com) concludes that high-speed access lines will grow strongly for the next two years and then the market will start to reach saturation. The growth rate will slow as the penetration rate nears 80 percent in 2010. The fore-

cast also calls for xDSL lines to overtake cable modems in mid-2007.

Reporting on high-speed access statistics in 3Q 2006, Information Gatekeepers finds that 47 percent of households, or 51 million, have high-speed access, and DSL accounts for nearly 45 percent of the total.