A Monthly Staff Report

Focus this month: Broadband Market Growth

Emergence of New Wireless Standards Reflected in Market Trends

LONDON, UK – Three new reports from Infonetics Research (www.infonetics.com) track the changing markets for wireless equipment.

The WiMAX equipment market, though still small, surged in the first quarter of 2006, with revenue jumping 48 percent to $68.3 million, according to the *WiMAX and Outdoor Mesh Network Equipment* report. Annual revenue is forecast to reach $1.7 billion by 2009.

The increases mainly reflect mounting shipments of WiMAX customer premise equipment units, indicating that service providers with WiMAX networks are driving subscriber growth. The WiMAX market will continue to grow rapidly as WiMAX evolves from a fixed-only solution to both a fixed and mobile solution. WiMAX is expected to become an established technology incorporated into PCs by late 2007.

According to the latest *Wireless LAN Equipment* report, worldwide wireless LAN equipment revenue rose 8 percent in 1Q06 to $639 million, driven by strong sales in the enterprise segment.

Sales of enterprise wireless LAN equipment revenue topped $282 million in 1Q06, up 11 percent from the previous quarter, largely due to growth in WLAN switches and controllers. Enterprise WLAN revenue is forecast to more than double by 2009, reaching $2.4 billion, as most verticals adopt enterprise-class WLAN equipment and leverage mobility for data networking and IP voice. Mobility is now a key part of enterprise networking strategy, according to Infonetics, and wireless LAN switch and controller sales should rise by double digits each year through 2009.

By contrast, the worldwide radio access network equipment market fell 22 percent to $7.4 billion in 1Q06, according to the latest *Radio Access Network Equipment* report. Revenue from CDMA/EV-DO/EVDV and GSM/GPRS/EDGE equipment fell sharply, while W-CDMA/UMTS RAN equipment rose by 8 percent.

This change reflects the move to 3G networks, with 2G/2.5G equipment accounting for a declining proportion of the RAN (Radio Access Equipment) market while 3G equipment grows from 19 percent of overall RAN revenue in 2005 to 73 percent in 2009.

While the rollout of 2G and 2.5G equipment continues in developing countries, established cellular markets are now predominantly driven by 3G upgrades, according to Richard Webb, analyst at Infonetics Research. As the volume of RAN equipment drops, prices are under pressure and are also falling. Not even 3G equipment will be immune to this pricing pressure, meaning that annual worldwide RAN revenue in 2009 will look more like quarterly RAN revenue in 2004.

Converged Wi-Fi/Cell Phones?

Cell phones with WiFi capabilities are expected to be common by 2010 – 132 million, says In-Stat in a new report, "The Road to Convergence: WiFi/Cellular Handsets Get a Voice." Although carriers have been reluctant to offer WiFi-capable handsets, WiFi has spread so fast that carriers will not be able to resist much longer. Such phones would allow carriers to provide VoIP.

"In the end, most US cellular carriers will embrace WiFi in their handsets, as carriers know that if they don't, other carriers will, and these carriers will likely steal away some of their customers," says Allen Nogee, In-Stat analyst. In detail, In-Stat found:

- More than 20 cellular handset models now have, or will soon be, released with embedded WiFi access.
- A few cellular carriers are planning to offer services that support voice calls over both cellular and Wi-Fi, and some WiFi/Cellular handsets are incorporating VoIP clients for services like Skype.
- It had been assumed that business customers would be first to adopt WiFi/Cellular handsets, but in fact consumers are likely to be more receptive to early adoption of the technology.

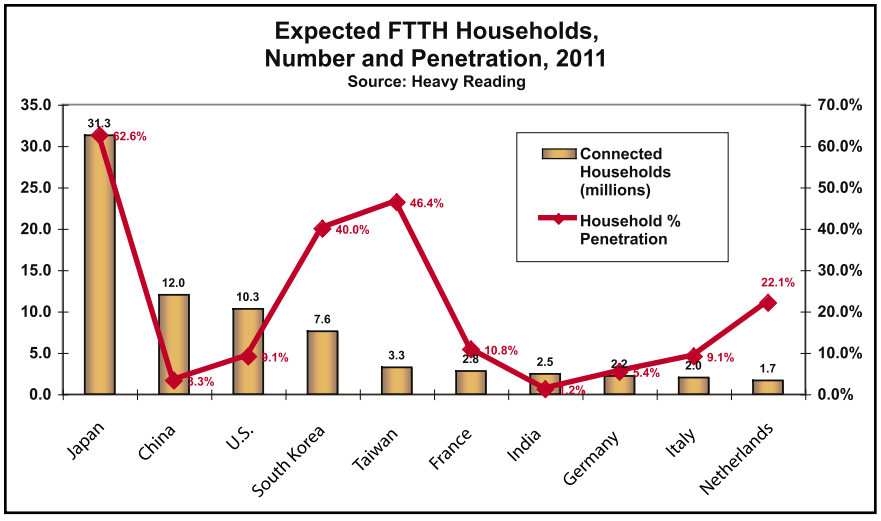
86 Million Fiber Homes by 2011

After almost three decades, fiber to the home (FTTH) is finally emerging into the mainstream, says a new report by Heavy Reading (www.heavyreading.com). The report confirms that FTTH is set to transform the telecom environment worldwide over the next decade; like cellular technology, it will have a deep impact on the entire supply chain, including technology vendors and network operators.

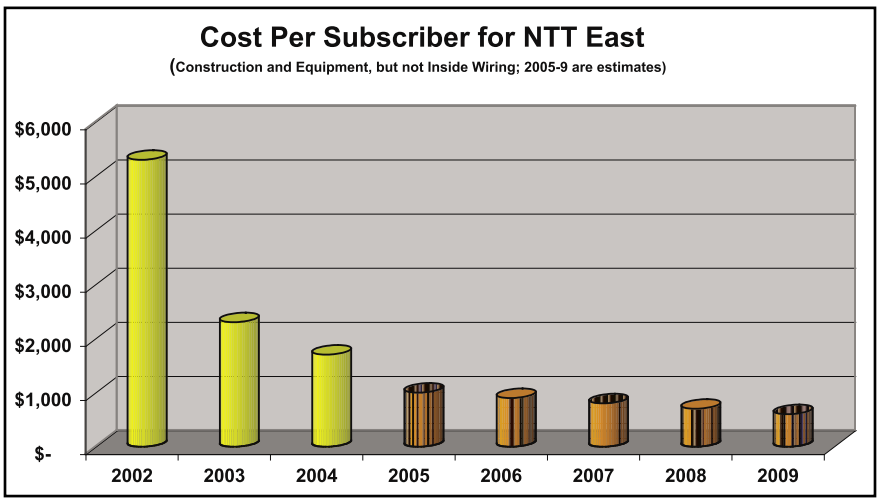
The total number of homes worldwide that will be reached by next-generation fiber-optic networks will soar from about 11 million this year, triggering a potentially massive deployment of digital and multimedia communications and entertainment services.

Over the next 15 to 20 years, copper access networks worldwide will be largely replaced by a fiber access network, due to a growing perception that copper access networks will soon be unable to meet the ever-growing consumer demand for bandwidth. Competition to move customers onto triple-play service packages will also lead some providers to deploy fiber in the hope of pre-empting or frustrating future competition.

A mass migration to fiber has begun in several countries, notably Japan, Sweden, and the U.S. They will be joined in the next year or two by China, France, South Korea, and the Netherlands, among others, and ultimately by every city where consumers are ready to pay for higher performance and richer services, the report says.



Japan will lead the way in FTTH connected homes (not deployments) at the start of the next decade, both in number and in percent of households passed. The figures are open to question, as Verizon alone is adding 3 million a year in the US (21 million pased by 2011). Doubling its take rate from current levels would give it 10 million connections alone.



NTT East says its cost to pass a home is now about $800. Verizon is in line, estimating a bit over $700 for 2006. In-home connection costs for Verizon double the cost, however.

Key findings of the report include:

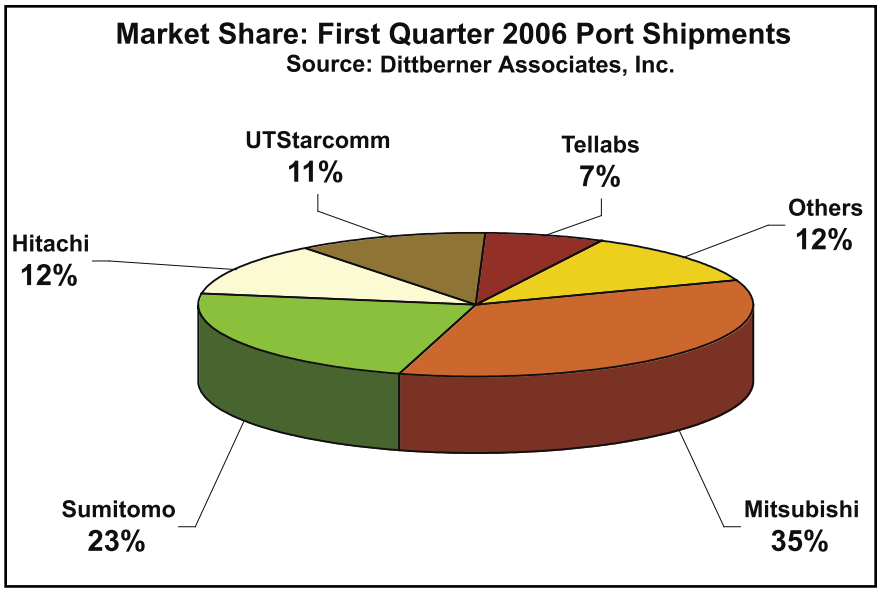
- FTTH growth over the next five years will be dominated by Asia, which will have 69 percent of the world's subscribers. The rest of the subscriber base will be split equally between the Americas and the Europe/Middle East/Africa region.
- During the next 12 to 24 months, we will see the emergence of a new broadband "gold standard" of 100 Mbps symmetric, driven by HDTV, next-generation gaming, personal video, and digital photography. This standard will strain the capabilities of VDSL2 and encourage telcos to begin the transition to FTTH.
- GePON is the solution of choice in most Asian countries, but GPON will dominate in the U.S. In Europe, most municipal and utility builders are opting for active Ethernet, which will make it a more important technology there.

FTTH Shipments Rise 22 Percent in 1Q06

According to the Broadband Quarterly Shipment Analysis from Dittberner (www.dittberner.com), worldwide FTTH shipments rose 22 percent quarter-over-quarter in the first quarter of 2006, and 180 percent from the same quarter last year. Of the 925,000 FTTH subscribers added worldwide, 81.5 percent were in Japan. Market leaders were Mitsubishi, Sumitomo, Hitachi, UTStarcom and Tellabs.

Japan's favored technology, GePON, accounted for 75 percent of the ports shipped, while 25 percent are using BPON. Although few GPON systems have yet been deployed, GPON is the basis of the RFP issued by AT&T, Verizon and BellSouth late last year and is expected to become the de facto standard in North America.

Japan is on target to add 3 million FTTH subscribers this year, and plans to continue until 30 million homes are connected with fiber. European cities, like Paris and Amsterdam, have begun a number public/private FTTH network efforts that have attracted the interest of large providers, such as France Telecom, which is planning its own FTTH rollout in Paris.



Mitsubish ruled on market share early this year.

The Dittberner analysis notes that the North American market is developing differently than in Europe and Asia. Verizon has not slowed down its deployment of BPON products while it prepares for GPON, and it is experiencing a dramatic drop in the cost of FTTx deployment. Verizon now estimates that it will cost only $715 to connect a home with fiber in 2006, compared with $1200 at the beginning of 2005. On the DSL front, operators are deploying legacy ADSL and delaying any large-scale DSL upgrades as they concentrate on attracting new subscribers with low-cost DSL. Dittberner expects AT&T and BellSouth to follow Verizon's lead and deploy more FTTH while cutting back on their ambitious DSL upgrade plans.

Mobile TV Explosion Due

In-Stat predicts that the number of mobile TV subscribers, now about 3.4 million globally, will grow to 102 million by 2010. Most of those new subscribers will be in Asia and Europe. But American markets should see three firms planning to introduce mobile video broadcast services by the end of 2007. MediaFLO (Qualcomm) plans to be first, with services in the fourth quarter of this year; Hiwire (Aloha Partners) and Modeo (Crown Castle) are expected to follow.

Because cell networks and conventional broadcasting do not have the available bandwidth, carriers are turning to mobile TV networks. "The greatest challenge for mobile TV broadcast operators is to acquire the spectrum necessary to offer services," says Michelle Abraham, In-Stat analyst. "Spectrum availability may determine which of four standards is chosen, and also impacts the business case for the deployment of a network."

In-Stat notes that each standard has advantages and each has a vendor ecosystem behind it to enable deployment today. Mobile carriers, mobile TV network operators, and content providers will soon be testing business models to determine what mobile phone subscribers are willing to pay to watch and what advertisers are willing to pay to reach them.

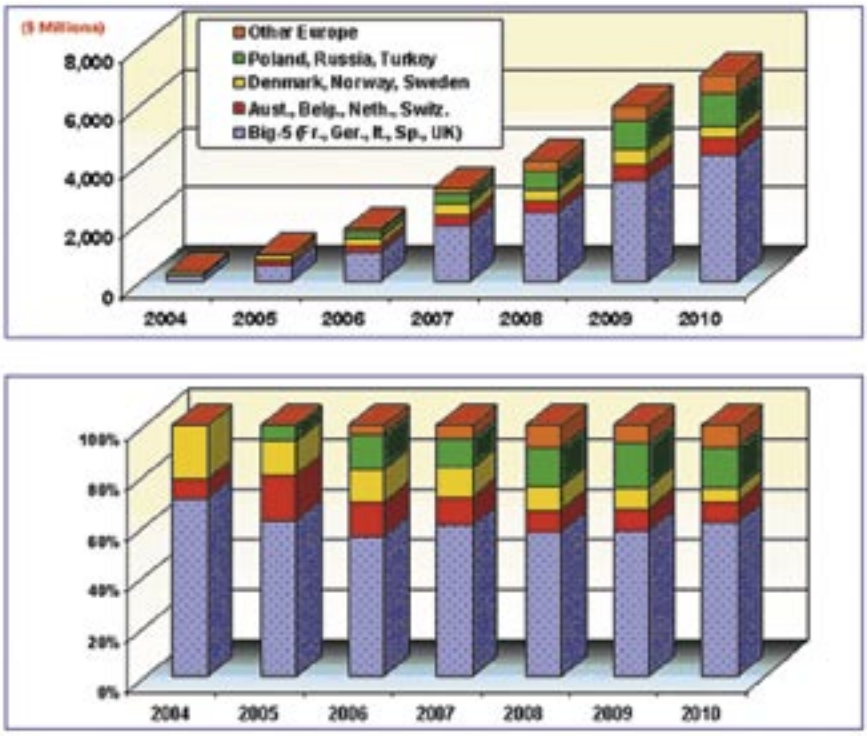
One big booster has been the soccer world cup, according to a report by Informa Telecoms & Media.

Fiber Optics Surging in Europe

The number of subscribers served by fiber to the premises or fiber to the building in Europe will more than double over each of the next five years, growing from one million in 2005 to 48 million in 2010, according to a new report by KMI Research (http://kmi.pennnet.com).

To supply that massive deployment, the market for fiber optics in Europe's broadband access networks will grow at 49 percent a year, from $950 million in 2005 to $7.05 billion in 2010. Europe's broadband access network operators will install more than 36 million kilometers of cabled fiber in 2006 through 2010.

While Denmark, France, Italy, the Netherlands, and Sweden were Europe's FTTP innovators, other markets will ramp up over the next few years. By 2010, these five pioneering markets will account for only 41 percent of European FTTP and FTTB.



FTTH Passes the 5-Million Mark in Japan

Japanese fiber-to-the-home subscriptions doubled in the year starting April 1, 2005, reaching 5.35 million by the end of March 2006, according to a report from Tokyo's Multi Media Research Institute (www.m2ri.jp). By contrast, ADSL subscriptions increased from 13.7 million to 14.5 million over the previous year.

By March 2009, MMRI expects the number of FTTH subscribers in Japan to reach 19 million and total broadband subscribers to reach 37 million. ADSL subscribers are expected to decrease to 13.9 million, and cable broadband subscribers are expected to rise moderately to 4.4 million.

Broadband CPE Revenue up 3 Percent to $1.3B in 1Q06

The worldwide market for broadband customer premises equipment (CPE) increased by 3 percent to $1.3 billion in 1Q06, despite unit shipments dipping by 2 percent to 30.2 million, according to the latest ***Broadband CPE*** report from Infonetics Research (www.infonetics.com). Service providers and cable operators reached into their inventory for baseline CPE without buying as many new products,

Infonetics expects annual broadband CPE revenue to increase to $8.6 billion in 2009, as service providers continue to bundle voice, data, video and wireless services in triple- and quadruple-play offerings to attract new customers and reduce churn.