Yano Research Institute

September 1, 2005

PRESS RELEASE

Yano Research Institute Ltd.
2-46-2 Honcho, Nakanoku,
Tokyo 164-8620, Japan

FTTH MARKET IN JAPAN AND ITS FUTURE PROSPECTS 2005

Yano Research Institute Ltd. (YANO) has conducted researches on the FTTH market in Japan based on specifications below. In relation to the internet market, YANO forecasted the number of subscriptions to internet access services by type of connection (i.e. dial-up/ ISDN, DSL, CATV internet, FTTH, and FWA) for up to 2010, focusing on FTTH in particular. It also reports trends of FTTH services and applications. Concerning optical transmission system market, market size, market trends and market prospects are reported on PON systems and optical media converters that are parts of infrastructure for FTTH services. In addition, corporate data, business operations and strategies, etc. of each communication carrier and devices and component manufacturers engaging in FTTH business are introduced and analyzed individually.

1. Research Target	:Communication carriers (8 firms), Optical communication related device and component manufacturers (8 firms)
2. Research Period	:January, 2005－March, 2005
3. Research Methodology	:Face to face interviews supplemented by survey and interviews by telephone, fax, and email.

Research summary

- **Estimated breakdown of subscription to broadband access services by connection type at the end of 2004 is: 13.67 millions for DSL, 2.77 millions for FTTH, 2.96 millions for CATV internet, and 30 thousands for FWA.**
- DSL had driven total broadband market until the first half of FY2004. In the latter half of 2004, net monthly increases of DSL subscription and FTTH subscription have became much closer, both staying at the level of somewhere between 100 to 150 thousands.
- Competition among FTTH service providers has started especially by promoting “triple play” packages that include 0AB-J numbering-scheme-compatible optical fiber IP phone services and video distribution services, contributing to increase subscriptions to the FTTH services.
- **Subscription to broadband access services in Japanese domestic market is forecasted to be approx. 22.75 millions at the end of FY 2005 and approx. 38.25 millions at the end of 2010.**
- Net monthly increase of DSL subscription and FTTH subscription are expected to be reversed in the beginning of 2005. Total DSL subscription is forecasted to peak in the beginning of 2006 and then to decrease gradually to the level of approx. 14.31 millions at the end of 2006.
- The killer application for promoting FTTH penetration should be 0AB-J numbering-scheme-compatible optical fiber IP phone. FTTH is expected to exhibit major growth in the period from FY 2005 to FY 2007. Competition among communication carriers such as NTT East, NTT West and electrical power supply-related companies is anticipated to become tougher for drawing customers.
- **Market size of PON system was 47 billion yen in FY 2004. It is estimated to be more than doubled in FY 2005 to the scale of approx. 100 billions of yen.**

- Access system market is offering the highest market potential for optical fiber communication systems. PON system market, in particular, is drastically growing. With the introduction of GE-PON systems by the communication carriers, the PON system market grew to 47 billion yen in FY2004. In 2005, the market is expected to further grow and be doubled to the level of 100 billion yen. On the other hand, the market of media converter, one of the access systems, is forecasted to shrink further in and after 2005.

Report Title: "*FTTH MARKET IN JAPAN AND ITS FUTURE PROSPECTS 2005*"

Issued in: August, 2005

Report Size/No. of pages: A4/ 112 pages

Price: 300,000 yen (15,000 yen of consumption tax will be additionally charged for sales in Japan.)

Orders and Inquiries: Visit http://www.yanoresearch.com/mailform_R.htm

Contacts: Koichi Seto

International Business Development Phone: 81-3-5371-6907

Short descriptions of research results and analysis

Transition of subscription to internet access services in Japanese and future perspectives

- The year of 2004 could be regarded as a turning point for the broadband market. In 2004 new subscription to ※1DSL services slowed down despite the steady increase until then. On the contrary, new subscription to the ※2FTTH services started to show remarkable increase in the latter half of the year. The net monthly increase of subscription have constantly stayed somewhere between 100 to 150 thousands for both DSL and FTTH since September 2004. This trend represents the tendency of "slowing DSL and growing FTTH" considering the fact that the monthly increase rate of DSL subscription had been three times as much as that of FTTH, with approx. 300 thousands of net monthly subscription increase for DSL compared to approx. 100 thousands for FTTH as of March 2004. It is highly probable that the net monthly subscription increases will be reversed between DSL and FTTH sometime in the beginning of 2005.

- FTTH service providers are going to promote their services more aggressively to expand their businesses especially in 2005 and following years. Accordingly, new subscription to the FTTH services is expected to be further accelerated in future. As one of the remarkable trends at FTTH service providers, 0AB-J numbering-scheme-compatible optical fiber IP phone service is positioned as the killer application for their sales and marketing strategies. Electric power supply related companies, in particular, are targeting current ADSL users for their promotions, encouraging them to switch to the FTTH services by extensively featuring advantages of their optical fiber IP phone services. NTT EAST and NTT WEST have also started "Hikari Denwa (Optical Fiber Phone)", an IP phone service of similar kind, and competition for the FTTH related services is becoming more and more intensified.

- Most service providers are pursuing strategies to broaden target customer base, targeting not only "heavy internet users" but also "light users" and "potential users" who currently are ※3narrowband users or nonusers of internet. The service providers are positively appealing merits and attractions of IP phone services and video distribution services in addition to the internet access to broaden their customer base. Most providers also have common intention to escape from fierce price competition by enriching the variations of services they can provide.

- FTTH is anticipated to exhibit major growth in the period from FY 2005 to FY 2007. As mentioned before, FTTH is not used simply to connect PCs to the

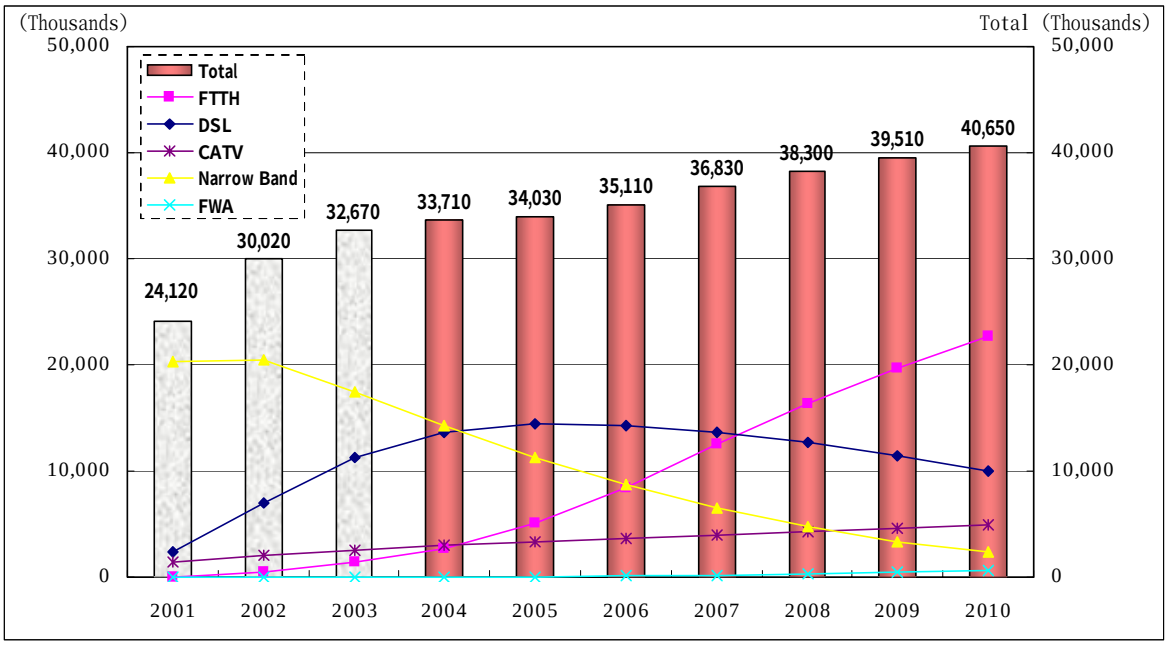
Internet, but through the provision of TV and telephone services represents a "lifestyle (and information) infrastructure" closely linked to daily life. The addition of other digital electronic and home security services in the future is expected to lead to major growth.

- It is expected that DSL subscription will peak at as early as the beginning of FY2006. By the end of 2007, the total subscriptions of DSL services and that of FTTH services will almost match at the level of somewhere between 12.6 millions and 13.6 millions. The net annual increase of subscriptions to FTTH may be peaked in 2007 and then the penetration rate may be slowed. The number of subscription to FTTH is expected to reach approx. 22.72 millions in 2010, and to DSL to drop down to 10.07 millions in the same year.

- The breakdown of subscriptions to internet access services by connection type is forecasted to be: approx. 55.9% for FTTH, 24.8% for DSL, and 12.0% for ※4CATV internet.

Forecast of internet access penetration (no. of subscriptions) by connection type

(Estimated by Yano Research Institute Ltd: As of March 15, 2005)



(Thousands)

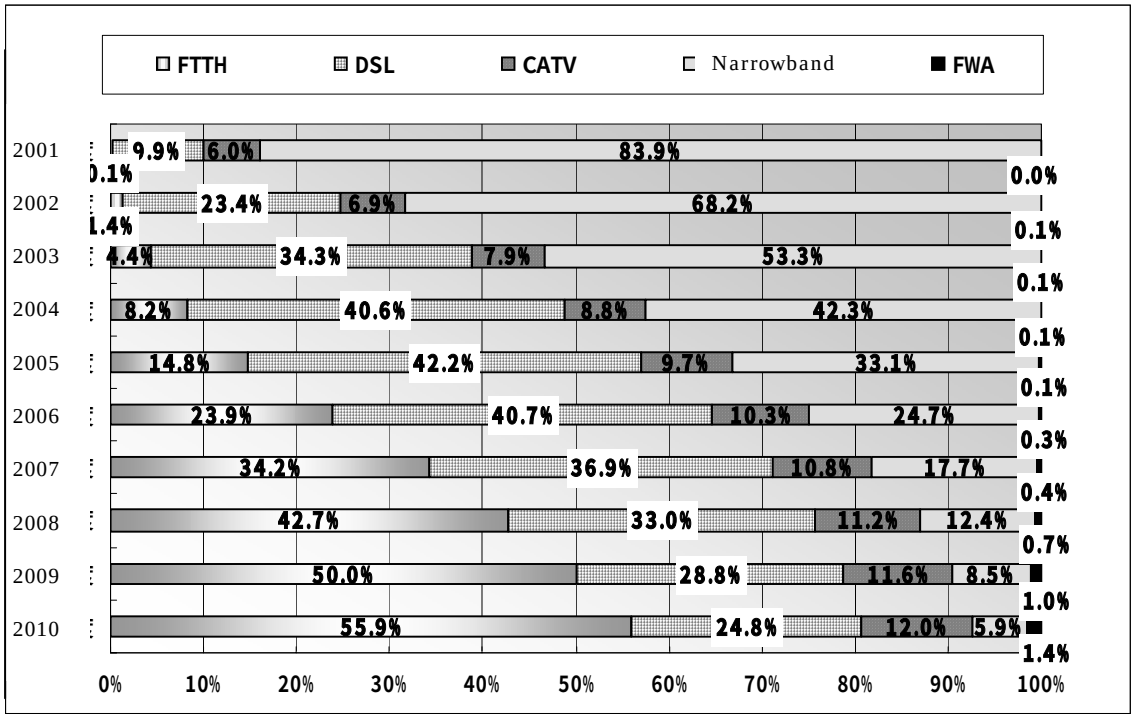
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
FTTH	30	420	1,450	2,770	5,030	8,390	12,590	16,370	19,760	22,720
DSL	2,380	7,020	11,200	13,670	14,370	14,310	13,600	12,650	11,380	10,070
CATV	1,460	2,070	2,580	2,960	3,300	3,630	3,960	4,280	4,590	4,880
Narrow Band	20,240	20,480	17,410	14,280	11,280	8,680	6,510	4,750	3,380	2,400
FWA	10	30	30	30	50	100	170	250	400	580
No. of broadband subscriptions	3,880	9,540	15,260	19,430	22,750	26,430	30,320	33,550	36,130	38,250
Total	24,120	30,020	32,670	33,710	34,030	35,110	36,830	38,300	39,510	40,650

(Estimated by Yano Research Institute Ltd: As of March 15, 2005)

2001 – 2003 : Based on data from Ministry of Internal Affairs and Communications
2004 and after: Estimated by YANO

Forecast of internet access subscription by connection type

2001 – 2003 : Based on data from Ministry of Internal Affairs and Communications
2004 and after: Estimated by YANO



(Estimated by Yano Research Institute Ltd: As of March 15, 2005)

※ 1 DSL (Digital Subscriber Line): An asymmetric digital data transmission using higher frequency band than that for voice communication. The download traffic speed is around 1Mbps－50Mbps.

※ 2 FTTH (Fiber To The Home): A type of data transmission and internet access services using optical fibers. Majority of the services offer transmission rate of 100Mbps for both upload and download traffic.

※ 3 Narrowband: A type of internet access services using conventional telephone lines that include dial-up (analogue) connection and ISDN (digital) connection. The transmission rate is approx. 56kpbs－128kbps.

※ 4 CATV (Community Antenna TeleVision) Internet Service: A type of internet access services that utilizes Cable Television networks. Transmission rate is approx. 1Mbps－30Mbps for download traffic.

※ In this report, FTTH subscribers are defined as end-customers who have made contracts with service providers. Accordingly, this definition is different from FTTH line contracts that the service providers commonly use. (The number of contracts is only one for one housing complex from the providers' view points regardless of the number of subscribers in the complex who have made contracts individually with the service providers.) Even if the access lines are branched into each household using VDSL (Very high-bit-rate Digital Subscriber Line), the services are counted as FTTH connection services in this report as long as the housing complex is connected with optical fibers from communication centers of the providers.

※ Use of access lines by corporate users for their companywide networks are partially included in the subscription.

FTTH system market is rapidly growing in accordance with the number of FTTH subscribers

- The area currently offering the highest market potential for optical fiber communication systems is the access system market. In particular, the [i]PON system market is beginning to show rapid growth. An equipment known as a [ii]GE-PON (Gigabit Ethernet/Passive Optical Network) system plays a key role in this trend. From the providers' point of view concerning its characteristics, this system allows up to 32 users to be handled with a single optical fiber, increasing optical fiber utilization efficiency. The ability to handle multiple users on a single port (one optical fiber) within the communication center also reduces the space required for equipment.

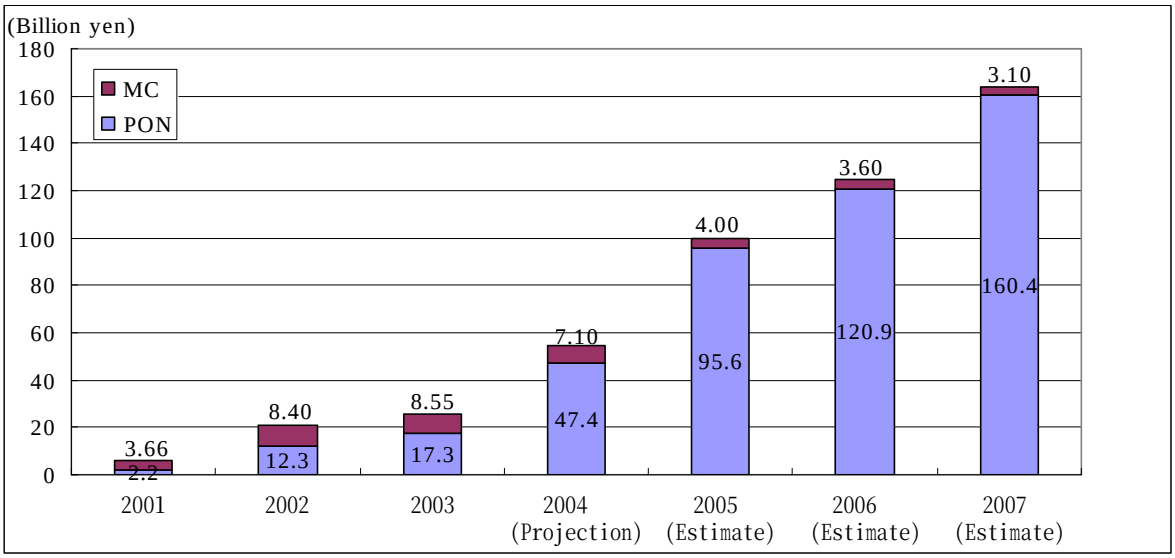
- For these reasons, this system is likely to be especially popular among companies offering services renting such equipment as the [iii]Unbundle Menu (from NTT East and NTT West) or using space from other businesses. Companies such as Softbank BB and KDDI that actually provide services using the Unbundle Menu have already installed GE-PON systems.

- From the users' viewpoint concerning its characteristics, service speeds can be upgraded from the normal several tens of Mbps to over 1 Gbps. Most current services are limited to the 100 Mbps range due to policy regulations of providers, one reason being that no attractive service currently exists that would require speeds greater than 100 Mbps. Additionally, consumer equipment (primarily PCs) is generally not yet capable of handling such speeds.

- PON systems allow the provision of video services in addition to voice and data transmissions over a single optical fiber, but will require transmission speeds in the Gbps range when services requiring large volumes of data, such as video and broadcasts, become commonplace.

- The groundwork for the gigabit communication services has been already laid. We only have to wait for the creation and introduction of attractive services that necessitate the gigabit communication services to be offered by the providers. Once these services become available, FTTH service market should further grow, and accordingly, the optical fiber transmission equipment market should also grow.

Transition of access system market size



※ Projected for 2004; Forecasted for 2005 and following years
(Estimated by Yano Research Institute Ltd.)

Research target companies

Communication carriers	NTT East, NTT Wes, KDDI, USEN Corporation, K-Opticom, Chubu Electric, Energia Communications, Kyushu Telecommunication Network
Equipment Manufacturers	NEC, Oki Electric、Sumitomo Electric Industries, HITACHI, Fujikura, Fujitsu, Mitsubishi Electric, UTStarcom Japan

[i] **PON system**：A system in which optical signals from the center are split using an optical splitter. This connects a number of subscribers to the center.
[ii] **GE-PON（Gigabit Ethernet-Passive Optical Network）**：A kind of PON systems that achieves transmission rate of 1Gbps.
[iii] **Unbundle Menu**：An access fee structure for telecommunication companies.