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***FIBER-OPTIC TELECOMMUNICATION MARKET  
IN JAPAN 2006***

*~ FTTH, A KEY DRIVER TO BRING NGN ~*

➔ **Research Outline**

**Study on the fiber-optic telecommunication market in Japan**

1. Research targets: Communication carriers (9 firms), Fiber-optic communication related system and device manufactures (10 firms)
2. Research period: May, 2006 ~ July, 2006
3. Research methodologies: Primary methodology of face-to-face interviews with relevant personnel of research target companies is supplemented and reinforced by telephone interviews and e-mail follow-ups.

➔ **Summary of Research Findings**

- **Capital investment by telecommunication carriers could be increased again in FY 2006, being prepared for NGN.**

Demand of optical transmission systems has peaked over the period between 2004 and 2005 since most major telecommunication carriers have done their prior investment for their optical networks, preparing for upcoming rapid increase in FTTH subscribers. Consequently, investment by those telecommunication carriers has slowed during the period between the second half of fiscal 2005 and the first half of fiscal 2006. In the second half of fiscal 2006 and thereafter, however, the demand of optical transmission systems is highly expected to increase again since those telecommunication carriers may start investing for the Next Generation Network (NGN) that NTT is going to start trial for in the second half of fiscal 2006.

- **Total optical transmission system sales reached almost 190 billion yen in FY 2005 and almost same amount could be expected for following years.**

The optical transmission system market reached 189.7 billion yen in sales in 2005, 6.7% increase over fiscal 2004 that showed 64% increase over the previous year (FY 2003). For several years after 2005, same level of market size is anticipated since the demand of access optical devices should increase in accordance with increase of FTTH subscribers. While net yearly increase of FTTH subscribers will gradually decrease after fiscal 2007, other markets related to NGN may rise, boosting total market size of optical transmission systems.

- **Market size of access optical transmission device reached 76.2 billion yen in FY 2005 being boosted by spread of GE-PON among NCCs.**

In FY 2005, demand of access optical transmission device increased 20% over the previous year and recorded well over 70 billion yen of market size. Rapidly increased demand of GE-PON (Gigabit Ethernet Passive Optical Network) has contributed to boost the market. Due to sharp decrease of GE-PON price, most NCCs (New Common Carriers) have started to use GE-PON for their access networks, partially replacing B-PON (Broadband Passive Optical Network), E-PON (Ethernet Passive Optical Network) or even media converters.

➔ **Report Title:** *“FIBER-OPTIC TELECOMMUNICATION MARKET IN JAPAN 2006”*

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## Description of Research

### 1. Research Background

The total number of FTTH subscribers in Japan has reached over 5.4 millions at the end of fiscal 2005 ending March, 2006, marking 88% year-on-year increase. Net yearly increase of FTTH subscribers has already surpassed that of ADSL, and FTTH has been becoming the most popular form of broadband internet access services in Japan. The number of FTTH subscribers is expected to reach over 27 millions by the end of fiscal 2011, which represent more than half of total number of households in Japan.

In addition to active sales promotions and advertisement offered by NTT and other major telecommunication carriers, lowered service fees of fiber-optic internet access plus IP phone services have contributed to the increase of FTTH subscribers. According to some of the major telecommunication carriers, 60 to 70% of their customers who have recently subscribed their FTTH services subscribe both internet access service and IP phone service because the service fees of both services combined are now lower than total service fees of conventional analog phone and ADSL.

The demand of optical transmission systems must largely depend on the popularity of FTTH services. The number of FTTH subscribers will keep sharply increasing for next several years, and subsequently, the optical transmission system market will keep booming.

### 2. Access Optical Transmission System Market

GE-PON is becoming most popular type of access optical transmission system due to economical merits it could offer and its capability to handle up to 1Gbps of bit rate. By using GE-PON, one fiber optic cable from a carrier's station could be split for up to 32 customers saving amount of fiber optic cable to be used. Another reason for the popularity of GE-PON is that more transmission capacity is required than before due to increase of video distribution services in addition to increase of FTTH subscribers. Capability of access systems to handle the level of 1Gbps is becoming a standard in the market.

While demand of GE-PON has been sharply increasing, there is steady demand of MC (Media Converter) although some telecommunication carriers are going to switch their access systems from MC to GE-PON. One of the reason why MC is still needed is that combined use of MC and VDSL for housing complex is still convenient and reasonable in cost. Since the demand of housing complex is increasing particularly in urban areas and the number of FTTH subscribers who live in housing complex is increasing, certain demand MC is expected for next several years.

Projected market size of access system market (PON + MC) in fiscal 2006 is 75.3 billion.

### **3. Core and Metro Optical Transmission System Market**

Among optical transmission systems used for core and metro networks, CWDM (Coarse Wave Division Multiplex) market has shown steady growth for last several years and expected to increase slightly in fiscal 2006 over 7.16 billion yen recorded in fiscal 2005. The demand of CWDM might have been boosted due to increased traffic between access networks and metro networks as a consequent of increase of FTTH subscribers.

The size of WDM (Wave Division Multiplex) market and SONET/SDH systems market has continued to be almost flat since fiscal 2004 and this trend may continue toward fiscal 2006. One of the reasons why the demand of these systems has not increased is because most telecommunication carriers have already spent a good amount of capital in 2004 and there might have been less needs of capitalization in 2005. Another reason may be that those telecommunication carriers have withheld further investment due to necessary investment to cope with the Next Generation Network in near future.

In fiscal 2006, the market size of CWDM systems is projected to be 7.35 billion yen, and likewise, 30.5 billion yen for WDM market and 68.5 billion yen for SONET/SDH systems market. The market of core and metro network systems could grow further when and after NGN shifts into full swing.

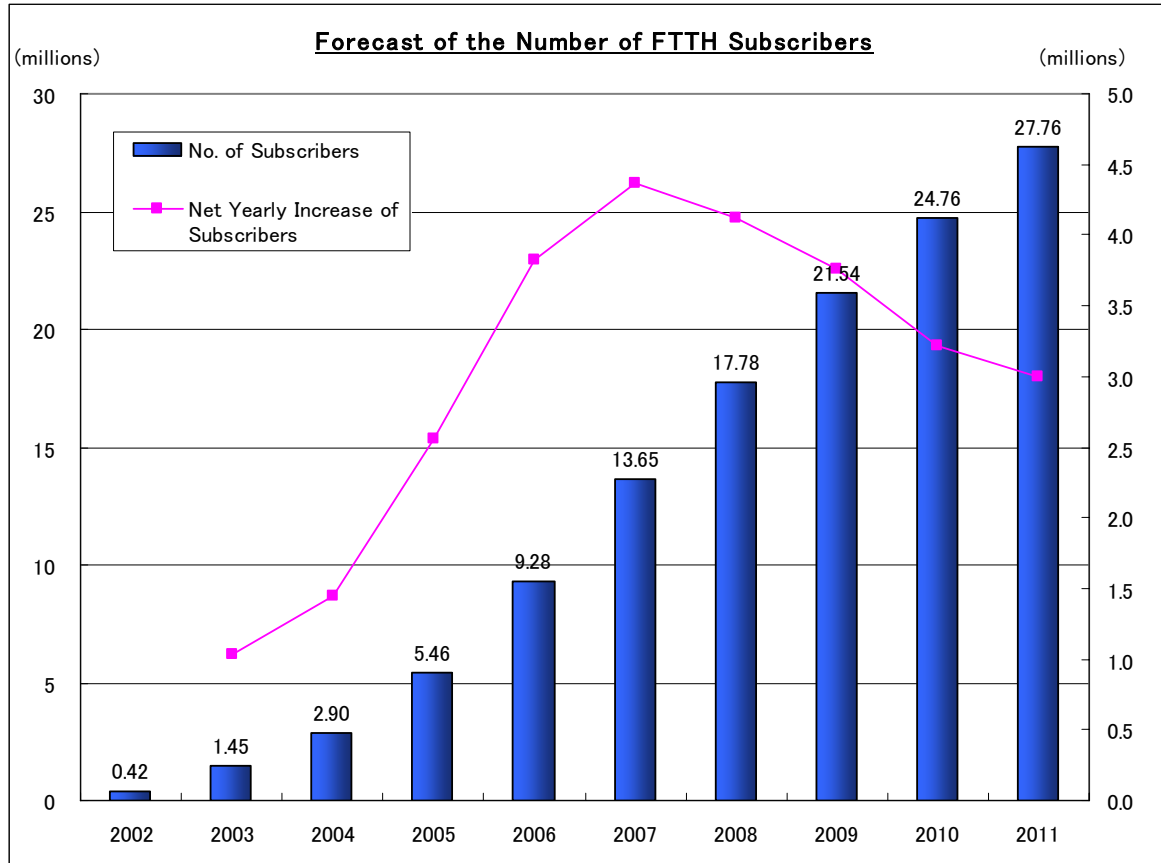
**Graph: Forecast of the Number of FTTH Subscribers**

(millions)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
No. of Subscribers	0.42	1.45	2.90	5.46	9.28	13.65	17.78	21.54	24.76	27.76
Net Yearly Increase of Subscribers		1.03	1.45	2.56	3.82	4.37	4.13	3.77	3.22	3.00

(Estimated by Yano Research Institute Ltd: As of June, 2006)

**Graph: Forecast of the Number of FTTH Subscribers**



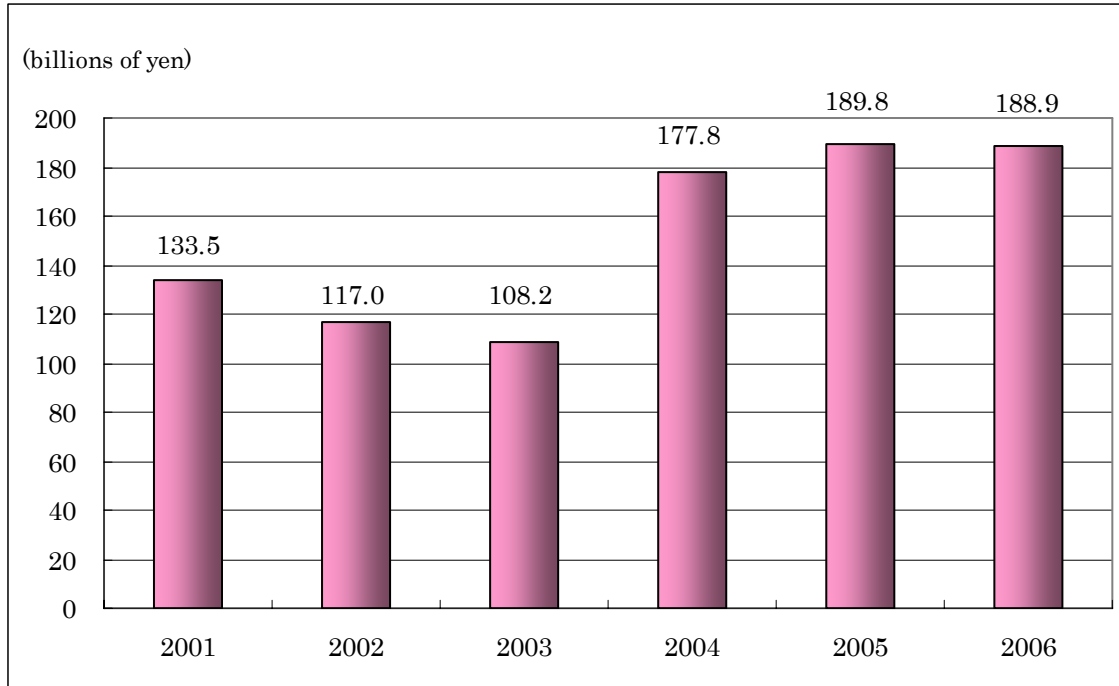
(Estimated by Yano Research Institute Ltd: As of June, 2006)

2002 – 2005 : Based on data from Ministry of Internal Affairs and Communications  
 2006 and after: Estimated by YANO

**Table: Total Optical Transmission System Market Transition** (Billions of yen)

	2001	2002	2003	2004	2005	2006
Total	133.5	117.0	108.2	177.8	189.8	188.9

**Graph: Total Optical Transmission System Market Transition**



Estimated for FY2006 by Yano Research Institute Ltd.

**Research target companies**

Communication carriers	NTT East, NTT West, Energia Communications, K-Opticom, KDDI, Kyushu Telecommunication Network, USEN Corporation, STNet, Chubu Telecommunications, UCOM
Device and Equipment Manufacturers	Mitsubishi Electric, Fujitsu, NEC, Hitachi, Sumitomo Electric Industries, Furukawa Electric, Oki Electric Industry, Fujikura, Cisco Systems, Corrigent Systems