



# Appendix D: Japan

Overview			
ITIF Rank: 2			
Subscribers per Household <sup>1</sup>	0.55	Incumbent Government Owned	33.7%
Internet Users in Millions <sup>2</sup>	87.54	Local Loop Unbundling: <sup>3</sup>	
Internet Users per 100 Inhabitants <sup>4</sup>	68.27	Full Copper Loop	Yes
Average Speed in Megabits per Second (Mbps) <sup>5</sup>	63.6	Shared Copper Loop	Yes
Price Per Month of 1 Mbps USD PPP <sup>6</sup>	.27	Bitstream	Yes
Percent of Urban Population <sup>7</sup>	66	Cable	No
Population Density per sq. km <sup>8</sup>	338	Fiber	Yes

**Geography and Demography**

Although Japan is more densely populated than the United States (338 people per square kilometer versus 31 in the United States<sup>9</sup>), it has a lower percentage of urban population (66 versus 80 percent).<sup>10</sup> This may explain why Japan’s broadband policy continues to focus on providing access to rural areas, which still lag behind urban areas in broadband penetration, particularly in access to fiber.

**Policy**

In 2000 Japan created its Information Technology Strategy Council and also established its “Basic IT Law,” which was immediately followed by its “e-Japan” strategy in January 2001. In 2003, the government expanded its goal to promoting broadband demand with the “e-Japan strategy II.” These programs provided a combination of subsidies, tax incentives, and low or zero-interest loans for broadband providers, triggering 220 projects in 2001 and helping to achieve the goal of offering 30 million households high-speed broadband access by 2004. The government followed with its “ubiquitous-net Japan” (“U-Japan”) strategy of 2004, with the added goal that by 2010 every device (such as mobile phones, personal digital assistance, even household appliances) would be connected to the network and able to be managed at any time and in any place.<sup>11</sup> In addition, the Japanese government emphasized the importance of closing the gap between urban and rural areas by establishing the “IT New Reform Strategy” in 2006 with a goal to provide broadband services to every household by 2010. The Japanese government’s tax incentives included allowing providers to depreciate during the first year about one-third of the cost of the broadband capital investments, as opposed to the usual depreciation schedule of up to 22 years for telecommunications equipment. Moreover, the government reduced fixed asset taxes for designated network equipment.<sup>12</sup> With respect to subsidies, the Bank of Japan (a government bank) guaranteed companies’ debts, allowing them to borrow money on capital markets more cheaply because these government-backed loans were less risky (no risk of default).<sup>13</sup>

## Rural Access

In 2004 the Japanese government extended subsidies covering about one-third of the cost of building a fiber broadband network to rural towns and villages. The only stipulation was that these municipalities would have to allow other providers to lease their networks. A number of municipalities used local and federal government funding to establish fiber-to-the-home (FTTH) in partnerships with NTT.<sup>14</sup> In addition, under its “IT New Reform Strategy” the government provided low-cost loans to any carrier with a fiber optic network installation plan for rural areas and tax deductions for broadband investments.<sup>15</sup>

## Competition

Unlike in the United States, Japan did not dissolve its incumbent telecommunications service provider, Nippon Telegraph and Telephone (NTT), although after many political battles it was reorganized under a holding company system in 1999 and was restructured in 2002. The holding company is NTT, and its five major businesses include NTT East, NTT West (local telephone companies), NTT Communications (long distance), NTT DoCoMo (mobile), and NTT Data (information services). Some of the government’s reluctance to curtail NTT’s market power may be due to the fact that the government still owns more than a third of the company. Yet, the government’s requirements for local loop unbundling and collocation in 2000 enabled several competing service providers to emerge, including KDDI, Yahoo! BB and K-Opticom. However, local loop unbundling is not the only reason competition took off. The government also set a very low price for competitors to access NTT’s unbundled loops, which allowed them to set low prices for their services. Softbank’s Yahoo! BB service initially led the market by offering low price, high speed services. As of 2003, Yahoo! BB had the lowest priced service at \$19.09 per month for 12 Mbps and \$20.54 for 26 Mbps.<sup>16</sup> While this aggressive approach was successful in earning a strong place in the broadband market (by 2005 NTT and Yahoo! BB each held about one-third) it also contributed to the company’s continuing losses (it only began to be profitable beginning in 2006).<sup>17</sup> Nonetheless, this strategy had a significant effect on NTT – forcing it to compete by lowering its prices and offering increased speeds.<sup>18</sup> Japan’s cable TV industry is highly fragmented, which makes it difficult for providers to upgrade their networks for two-way (broadband) service.<sup>19</sup>

## Fiber

In Japan several factors have driven fiber roll out. First, government support, including access to the government’s public fiber infrastructure, low interest rate loans, and tax deductions, has spurred fiber build out.<sup>20</sup> Second, because NTT was required to unbundle its copper loops at relatively low prices to allow competitors to provide digital subscriber line (DSL) services, NTT invested in fiber as a way to gain customers that it was more likely to be able to keep. NTT also faces competition from subsidiaries of electricity companies, which are using their own fiber networks to offer high-speed broadband services to their electricity customers.<sup>21</sup> K-Opticom began offering its optical broadband service as early as 2002, using its own networks (as part of the Kansai Electric Power Company), which drove down prices for FTTH.<sup>22</sup> While NTT is also required to unbundle the fiber loop, the price that competitors pay is quite high, enabling NTT to obtain an adequate rate of return on its fiber investment.<sup>23</sup> As a result, NTT has invested more than \$200 billion in optical fiber installations.<sup>24</sup> NTT has pledged to provide FTTH service to 30 million users (half of the 60 million households subscribing to its phone service) by 2010.<sup>25</sup> Nonetheless, despite aggressive rollouts of FTTH by NTT and its competitors, it is more commonly available in urban areas, such as Tokyo, Osaka, and Nagoya, and is largely absent in rural and more sparsely populated areas.<sup>26</sup>

## Demand

Video applications, such as video-on-demand (VoD) and broadcasting over broadband, are key drivers of broadband demand. Major providers, including NTT, KDDI, and Softbank (Yahoo! BB) all are providing Internet Protocol television (IPTV) services. NTT's internet service provider (ISP) unit provides Internet broadcasting with VoD and multi-channel TV broadcasts. KDDI broadcasts over fiber to multiple dwelling units and Softbank offers TV-over-DSL through BB Cable, the first Japanese company to receive a license to broadcast video over the telecommunications network (in 2002).<sup>27</sup> Another significant driver of broadband take up in Japan is Voice over IP (VoIP), with subscribers expected to grow to 27.9 million in 2007.<sup>28</sup> Yet the real impetus has been an explosion of broadband content – particularly from the entertainment industry. NTT began offering Walt Disney content in 2003 and multi-channel broadcasts over ADSL in 2004. In addition, online gaming is increasingly popular and Softbank launched an online gaming Web portal called BB Games in 2003. KDDI followed with its own broadband network game system.<sup>29</sup> The government also has driven demand by putting all administrative agencies online, with the result that in 2005 Japanese citizens completed more than 95 percent of government applications and notifications online, and more than 63 percent of other types of administrative procedures.<sup>30</sup> In addition, nearly all local municipal organizations had their own websites.

## ENDNOTES

1. OECD measures penetration on a per capita basis because comprehensive data on household penetration is generally unavailable. ITIF has used average household size as a multiplier to convert June 2007 OECD per capita penetration data to household penetration data. It should be noted that one problem with this method is that the OECD data likely also includes some DSL business subscribers.
2. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers," International Telecommunications Union ICT Statistics Database, 2006 <[www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#](http://www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#)>.
3. Unbundling is a policy by which regulators require incumbent telecommunications operators (those with dominant market status who control access to the telecommunications infrastructure) or cable companies to give their competitors access to raw copper pairs, fiber, or coaxial cable networks so that they can install their own transmission equipment at the incumbent's central office (local exchange). *Full unbundling* requires the incumbent to make all copper pair frequencies or fiber networks available to competitors. *Shared access* to the local loop requires the incumbent to make the "high" frequency bands (those that carry data, but not voice) of the copper pair available to its competitors, allowing them to offer xDSL broadband services. *Bitstream access* requires incumbent operators to allow competitors access to the incumbents' equipment at their central office. *Cable access* enables competitors to use cable companies' coaxial cable local loops and fiber access requires telecommunications operators to give competitors access to their fiber local loops.
4. International Telecommunications Union, "Internet Indicators: Subscribers, Users, and Broadband Subscribers," International Telecommunications Union ICT Statistics Database, 2006 <[www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#](http://www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx#)>.
5. Our methodology for calculating broadband speed in the ITIF Broadband Rankings involves averaging the speeds of the incumbent DSL, cable and fiber offerings provided in the OECD's April 2006 "Multiple Play," report, with each assigned a weight according to that technology's respective percentage of the nations overall broadband subscribership, as reported in the OECD's "Broadband Statistics to December 2006."
6. USD price per bit (PPP) of the fastest available technology is calculated from the broadband offerings examined in the OECD's "Multiple Play: Pricing and Policy Trends" report.
7. The World Bank, "Information and Communications for Development 2006," (2006): 172.

8. United Nations, "World Population Prospects: The 2006 Revision Population Database," 2007 <esa.un.org/unpp/>.
9. Ibid.
10. The World Bank, "Information and Communications for Development 2006," (2006): 214.
11. Yasu Taniwaki, "Broadband Competition Policy to Address the Transition to IP-Based Networks: Experiences and Challenges in Japan," (Tokyo: International Foundation for Information Technology, October 2006): 10-11.
12. "Understanding the Japanese Broadband Miracle," presentation at the Information Technology and Innovation Foundation, April 4, 2007 <www.itif.org/files/Ebihara\_Japanese\_Broadband.pdf>.
13. Thomas Bleha, "Down to the Wire," *Foreign Affairs*, May/June 2005 <www.foreignaffairs.org/20050501faessay84311/thomas-bleha/down-to-the-wire.html>.
14. Yonosuki Harada and Keiji Okada, "The Dynamics of Broadband in Japan: Some Best Effort for Broadband Penetration," presentation for NESCAP, June 21, 2007 <www.unescap.org/icstd/events/RW\_JUNE2007/HARADA.pdf>.
15. Yasu Taniwaki, "Broadband Competition Policy to Address the Transition to IP-based Networks: Experiences and Challenges in Japan," (Tokyo: International Foundation for Information Technology, October 2006): 7.
16. Ibid: 3.
17. Martin Fransman (ed.), *Global Broadband Battles: Why the U.S. and Europe Lag While Asia Leads* (Stanford, California: Stanford Business Books, 2006): 29.
18. Ibid: 30.
19. Paul Budde Communication Pty Ltd, "Japan - Broadband - Market Overview," Telecommunications and Information Highways (Bucketty, Australia: 2005): 5.
20. Yasu Taniwaki, "Broadband Competition Policy to Address the Transition to IP-Based Networks: Experiences and Challenges in Japan," (Tokyo: International Foundation for Information Technology, October 2006): 7-8.
21. Martin Fransman, "Why Japan and Korea Lead the U.S.A. and Europe in Broadband," *International Journal Technological Learning, Innovation, and Development*, Vol. 1, No. 1 (2007): 122.
22. Martin Fransman (ed.), *Global Broadband Battles: Why the U.S. and Europe Lag While Asia Leads* (Stanford, California: Stanford Business Books, 2006): 66.
23. See Ema Tanaka, Minoru Sugaya, Sayaka Shiotani, "Evolution of IP Network and Convergence in Japan – Impact of Hard law and Soft Law," presentation at ITS Conference in Beijing, 2006.06.13, slides 23-4 of PowerPoint presentation, states that unbundled fiber loops cost about \$50.
24. Yasu Taniwaki, "Broadband Competition Policy to Address the Transition to IP-Based Networks: Experiences and Challenges in Japan," (Tokyo: International Foundation for Information Technology, October 2006): 68.
25. Ibid: 78, 83.
26. Takanori Ida, "Discussion Paper No. 049: The Broadband Market in Japan," Interfaces for Advanced Economy Analysis (Kyoto University, Kyoto: December 2004): 16.
27. Ibid: 10-11.
28. Ibid: 8.
29. Ibid: 9.
30. Ministry of Internal Affairs and Communications, Information and Communications in Japan (2006): 41.