FTTH Review & Five-Year Forecast: The Road to Next-Gen PON

EXECUTIVE SUMMARY

Fiber to the home (FTTH) deployments continued to make strong progress in 2008 and early 2009, despite the economic downturn, and prospects for continued growth through 2010 look good. During 2008, just more than 9 million homes were added to the FTTH total (connected either in the home itself or in the basement of an apartment block), and in 2009 we expect that figure to increase by almost 9 million again, to reach 47 million homes at the end of the year.

However, progress is patchy. Some countries, notably China, are making a big leap forward, while others, such as France, have seen disappointing delays to ambitious rollout plans. This will only increase the variability in the world market on a wide range of factors, including penetration, technology, costs, regulation, major builders, and so on. These variations will also occur at the national level, creating some dilemmas for regulators and politicians. Already, a ten-year gap in fiber development has opened up between fiber-heavy countries such as Japan and European nations, including Germany and the U.K. – and this gap could widen.

For these and other reasons, the complexity of the FTTH market has increased in the 18 months since Heavy Reading's last major report on this topic – FTTH Worldwide Technology Update & Market Forecast (February 2008). Key reasons for this increasing complexity include:

- The imminent launch of next-generation PONs, creating more choices for both vendors and buyers. These new products include a 10GPON variant, created by the International Telecommunication Union; a 10GEPON variant, developed by the Institute of Electrical and Electronics Engineers; and various proprietary WDM PON schemes.
- The entry of another type of player – cable MSOs – into a market that already includes incumbent telcos, municipalities, utilities, real-estate developers, competitive telcos, and government-inspired "netcos" financed by direct grants or public-private partnerships.
- The lack of a clear regulatory model, with many important issues still to be settled in most markets, including the degree of construction subsidy permitted; the rules for access to (incumbent) fiber, ducts, etc.; and rules on access to apartment buildings.
- The potentially disruptive impact of next-generation mobile technologies, in particular the Long Term Evolution architecture, which may damage the case for fiber-based wired infrastructure in many areas – or actually stimulate it.

FTTH Review & Five-Year Forecast: The Road to Next-Gen PON delves into these and other critical questions about the FTTH market, providing a comprehensive global view of the ongoing transition to FTTH. The report examines key developments in both next-generation technology and cost issues, and analyzes the positioning of all major vendors in this fast-evolving environment.
This report builds on Heavy Reading's earlier FTTH research along the following lines:

- It looks at the prospects for existing and new technology, focusing in particular on the likely lifetime of existing PON technologies and the prospects for their replacement or augmentation by next-gen PON technologies.
- It offers an overview of important FTTH projects and developments over the past year in all geographies, including North America, Asia/Pacific, and Europe, as well as detailed discussion of major countries in each region and snapshots of many smaller countries.
- It includes a forecast for homes connected with fiber from 2007-2013, breaking down market growth by region, type of technology, and type of network builder and looking at anticipated penetration rates and households connected in all major economies.
- It presents a detailed technical comparison of all major vendors' FTTH offers, focusing on each company's flagship optical line terminal (OLT) product, as well as examining their offers in related areas, plans for future development, and strengths and weaknesses.

Heavy Reading's FTTH market forecast consists of a high-level global forecast, and regional and country forecasts for major regions and countries. It also segments the market by type of provider, type of property, and type of technology deployed.


<table>
<thead>
<tr>
<th>Year</th>
<th>Households (Millions)</th>
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<tbody>
<tr>
<td>2007</td>
<td>26.61</td>
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<tr>
<td>2008</td>
<td>35.98</td>
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<tr>
<td>2009</td>
<td>47.57</td>
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<tr>
<td>2010</td>
<td>61.78</td>
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<tr>
<td>2011</td>
<td>80.03</td>
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<tr>
<td>2012</td>
<td>102.52</td>
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<tr>
<td>2013</td>
<td>129.20</td>
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</tbody>
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*Source: Heavy Reading*

This forecast makes the following major assumptions:

- **Mass-market FTTH is inevitable:** Our underlying assumption is that following a period of experimentation and development, FTTH will begin to follow a typical S-curve growth in penetration in all developed nations, reaching 70 percent or more of households over a 15- to 20-year period.

- **Bandwidth demand trends are the core underlying driver:** We assume that a large percentage of high-end households in most countries will opt for the higher bandwidth available from FTTH wherever it is made available at competitive prices. Continuing rapid increases in the size of computer hard disks, digital memory, DVDs, cameras, and all consumer electronic equipment, together with unanticipated high-bandwidth applications development, will put continuing pressure on bandwidth needs.
• **Competitive pressures are the other key driver:** Pressure on service providers will continue to increase as a result of growing market saturation, local loop unbundling, and increasing competition between wireline telcos, wireless telcos, and cable MSOs for a diminishing new market for broadband. In order to create a long-term platform for high-bandwidth services, and be first with a fiber into the home, providers will slowly modify short-term return-on-investment approaches where these currently dominate planning, and move to longer-term views.

• **Cost of equipment and construction will continue to fall:** These costs will continue to fall steadily over the years of our forecast, but because costs overall remain dominated by civil/labor construction, the percentage decline will be relatively modest. The cost of connecting households will vary markedly from one country to the next – influencing adoption rates, but also resulting in a relatively slow transition to FTTH in countries where costs are relatively high.

• **Political and regulatory pressure to move to fiber is increasing:** Political pressure to move to fiber will gradually increase world-wide, as national governments seek to create the best possible environment for businesses – with a knock-on impact on household FTTH. Regulation of this market, however, may continue to vary widely.

• **Credit crunch and economic downturn:** Although our forecast has been modified by the recession, the impact of the economic downturn has been modest in most cases, as noted in the introduction.

In addition to high-level forecasts, **FTTH Review & Five-Year Forecast: The Road to Next-Gen PON** provides granular forecasts and analysis based on a range of parameters, including:

- Deployments by technology types
- Deployments by carrier types
- Deployments by geographic regions and key national markets
- Deployments by customer type (MDU/SDU)

**Excerpt 2: FTTH Households & Penetration in Major Economies (End of 2013)**

![Graph showing FTTH Households & Penetration in Major Economies](image)

*Source: Heavy Reading*
FTTH Review & Five-Year Forecast: The Road to Next-Gen PON also provides detailed insight into the market positioning of key technology suppliers in the FTTH sector, focusing on product strategies and differentiators, customers and geographic focus, and overall strengths and weaknesses for each supplier.

Report Scope & Structure

FTTH Review & Five-Year Forecast: The Road to Next-Gen PON is structured as follows:

Section I is an introduction to the report, with complete report key findings.

Section II defines the various types of FTTH and describes the major technologies, along with their advantages and disadvantages. It also examines in detail the emerging next-generation PON technologies – specifically 10GPON, 10GEPON, and WDM PON. This section also explores FTTH equipment and deployment cost trends.

Section III analyzes the three major regional markets – Asia/Pacific, North America, and EMEA – detailing which carriers are building and delivering FTTH, and where. This section offers detailed descriptions of FTTH projects in all major countries, including the U.S., China, Japan, France, Germany, and others, as well as snapshots of several dozen other significant countries.

Section IV provides a global forecast for the number of FTTH households that will be connected from 2007 to 2013, subdividing the market by major geographic regions, technologies, provider types, and dwelling types.

Section V reviews 24 major vendors in the FTTH sector, analyzing their flagship OLT products, exploring their strategies, deployments, and plans in this market, and evaluating their relative strengths and weaknesses.

FTTH Review & Five-Year Forecast: The Road to Next-Gen PON is essential reading for a wide range of industry participants, including the following:

- **FTTH technology suppliers**: How will demand for FTTH progress in coming months and years? How will the global economic downturn affect FTTH deployments? Which regions are going to see the most FTTH buildout activity, and which network operators will be leading the way? Which technology choices are deployers most likely to make? Are your products and marketing messages in line with customer plans and expectations? Are there significant gaps in your product line coverage that need to be addressed to meet future demand for FTTH solutions?

- **Other equipment suppliers**: How will demand for your products be affected by FTTH deployment plans? Which technologies are emerging as the most likely winners for tomorrow's access networks? Is your company in position to take advantage of those anticipated changes?

- **Network operators**: How do your plans for FTTH deployment compare with those of your competitors? Does your access strategy deliver the best cost-control option for your network, or are there other alternatives that will deliver greater efficiency? How do your projected costs for FTTH deployment match up with the rest of the industry? What is the competitive threat posed by FTTH from other operators?

- **Investors**: Which technologies are emerging as the winning solutions for FTTH, and which companies are the leading providers of those solutions? How will FTTH affect profitability for the telecom service sector in the coming months and years?

FTTH Review & Five-Year Forecast: The Road to Next-Gen PON is published in PDF format.