Five common FTTH myths debunked

Objections to fibre to the home (FTTH) simply do not stack up, says Hartwig Tauber

Thomas J. Watson, chairman and CEO of IBM, famously said: 'There is a world market for about five computers'. While this statement would have been accurate at the time (1943), viewed through the lens of history it seems rather silly. In any case, the statement is probably apocryphal. There is no record that Watson ever said anything of the sort.

The trouble is that, once a statement has been repeated many times, it starts to take on an aura of authenticity, even if it is outdated or was simply untrue in the first place. This seems to be the case with much of the 'common knowledge' around fibre to the home (FTTH). But the myths about FTTH are persistent: there's no demand; we can't afford it; there is no business case; it's too risky; governments have more urgent issues.

It's not hard to see how some of these myths arose. To keep up with demand, telecoms operators are migrating from telephone and cable-television networks based on copper to networks based on optical fibres, which can deliver higher speeds. However, migration to an all-fibre network requires major investment and takes considerable time to complete – probably at least a decade in most countries. Many operators, mindful of the short-term desires of their shareholders, would like to implement cheaper upgrades that provide more instant gratification. Equipment vendors have developed new technologies to boost broadband speeds, such as fibre to the cabinet (FTTC), very-high speed digital subscriber line (VDSL), and vectoring. And isn't the whole world going wireless anyway?

Well, it's not quite that simple. It's time to set the record straight.

Myth #1

There's no demand

More than 100 million homes already subscribe to a fibre-optic broadband connection – roughly equivalent to about one out of every 20 homes on the planet. The greatest concentration of FTTH subscribers can be found in the Asia Pacific region, where FTTH subscribers numbered 79 million by the end of 2012. In Japan, where FTTH deployment started over a decade ago, the majority of Japanese broadband subscribers use FTTH. In the United States, a nation of about 118 million households, over 11 million of them already subscribe to FTTH-based services. Russia alone had 8.9 million FTTH subscribers at the last count, even though large-scale deployment only started recently (nearly three million were new subscribers in 2012). These statistics clearly demonstrate that, where FTTH is available, people will connect to it.

In Europe, it's a different story. While Europe has the highest broadband penetration in the world, the region has the lowest percentage of homes using FTTH connections. In fact, Europe had just 8.9 million FTTH subscribers at the end of 2012, even though it is home to twice as many people as the whole of North America. The lack of FTTH in Europe isn't about lack of demand, though; it's about lack of availability. Operators in Europe have heavily and very successfully invested in copper-based broadband services such as DSL and cable-television networks. They invested more in these earlier technologies than operators in most other parts of the world, and many of them are naturally reluctant to make large-scale investments to upgrade their networks a second, or even third, time.

Even within Europe, however, we can see demand for FTTH services in individual countries where the market is more mature, or the incumbent is less invested in older technologies. Thanks to a national roll-out by the incumbent operator TEO, Lithuania has the highest penetration of FTTH networks in Europe, with 100 per cent coverage and more than 30 per cent of homes actually subscribing. In the Czech Republic, 54.9 per cent of homes subscribe to FTTH services where they are available (although coverage is lower). Take-up rates are also high in the Scandinavian countries of Norway, Sweden, and Finland, at 51.9 per cent, 48.4 per cent, and 41.7 per cent respectively.

Within areas that are poorly served by existing broadband, there may be considerable pent-up demand. FTTH operators that address underserved areas, usually rural towns or villages, are experiencing much better take-up rates than the major operators with their urban-focused roll outs. The often-cited example is the community broadband project OnsNet (OurNet) in the small town of Nuenen in the Netherlands, where more than 80 per cent of the community signed up to the local FTTH network. Another example is Altibox in Norway, a service provider that contracts with small network owners to provide a common web-based portal with a choice of services, which says it has connected about 70 per cent of homes passed. Our FTTH case studies collection contains more examples.

FTTH Council Europe

Hartwig Tauber, director general of the FTTH Council Europe

Myth #2

We don't need FTTH – we can achieve the same results with other technologies

Optical fibre is a unique transmission medium, with a theoretical maximum capacity so large that it can be considered unlimited. Signals can travel for many miles inside fibre-optic cable without significant degradation – typically 40 miles (60 kilometres) or more. Once installed, the FTTH network is upgraded by changing the electronics that create and receive the light pulses, not by replacing the cable itself. This is why FTTH is often referred to as 'future proof'.

It's not just about speed; there are practical advantages too. Fibre-optic cable is thin, light, and flexible, and easier to install than copper. It is also unaffected by water – water is the single largest cause of outages in copper-based networks – and immune to electromagnetic interference. Nothing hurts FTTH except a physical cable cut or destruction of the equipment. FTTH networks also consume less power than copper-based technologies. These advantages translate into a more reliable network, with lower operation and maintenance costs.

Copper cable, on the other hand, has already come up against fundamental physical limits to its capacity. The installed networks of telephone cables were never designed to carry high-frequency data signals, and so high speeds are available only over short lengths of cable. Techniques such as bonding (using multiple cables), vectoring (noise cancellation) and phantom mode (both techniques together) can boost capacity, but all have their drawbacks. The newest standard, expected to be complete in 2014, called G.Fast, promises to provide speeds of 500Mbps, but over a very limited range of 100m. While copper-based broadband speeds are improving, the gains can only be exploited by simultaneously bringing fibre closer to the consumer.

Mobile networks are even more restricted in capacity, because wireless spectrum is scarce and expensive and every user in the cell has to share that capacity. In any case, a mobile network is only wireless at its edges; the signal goes down an optical fibre sooner or later. To reduce the pressure on mobile networks, operators are actively encouraging their customers to offload mobile data traffic onto fixed networks using Wi-Fi or femtocells – a broadband-connected device in the home that acts like small base station. In our view, optical fibre and mobile networks are complementary rather than competitive. Mobile networks should be promoted for their strengths – the ability to provide internet connectivity on the move – rather than as a direct substitute for wired broadband connections.

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Myth #3

We don't need such high bandwidth

People often argue that we won't need the massive capacity that FTTH provides but, as the opening paragraph of this article illustrates, predicting the future is a notoriously perilous business. Historically, as internet connection speeds have increased, new technologies have always emerged to fill that bandwidth. The historical trend has been encapsulated in 'Nielsen's Law of Internet Bandwidth', an empirical observation which states that a high-end user's connection speed grows by 50 per cent annually, or doubles every 21 months.

We anticipate further bandwidth growth as a result of simultaneous broadband usage in the home: there will be more users, more applications, and more internet-enabled devices in each household, including autonomous devices, such as home security and control systems. High-quality internet video has very demanding bit-rate requirements, and will also stimulate demand for high-speed connections. Indeed, Cisco's *Visual Networking Index Forecast* predicts that internet protocol traffic will triple between 2012 and 2017, driven mainly by consumption of internet video.

FTTH operators have already found that, when their customers get access to more bandwidth, they will use it. In a 2010 study into next-generation service portfolios, consultancy ➤

Diffraction Analysis discovered that FTTH subscribers became net contributors to the internet, uploading more material than they downloaded. FTTH customers also subscribed to more services, utilising three to four times more bandwidth overall than their DSL-connected counterparts.

As bit-rate requirements continue to grow, the ability of broadband technologies to evolve to meet future needs is of paramount importance. The FTTH Council Europe believes that infrastructure upgrades should be carried out with a long-term view, especially where public money is involved.

Myth #4

FTTH is too expensive, and the business case is too risky

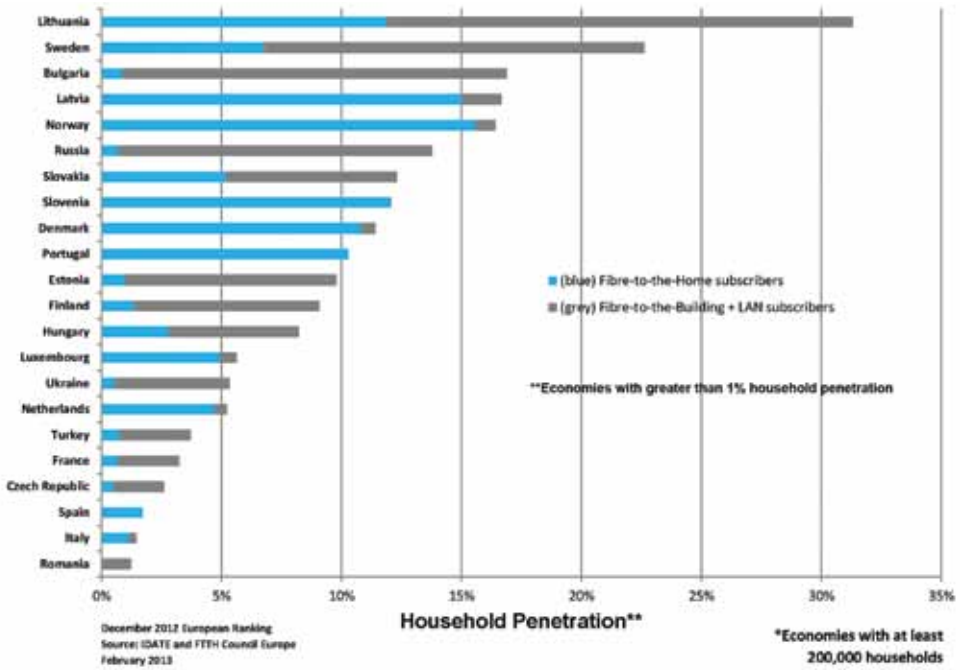
European telecoms operators, including incumbents and large alternative operators, invested a combined €24.8 billion on fixed network infrastructure in 2011. If the level of investment remains stable, then this would add up to €216 billion of new telecoms investment by 2020, and this sum doesn't include any government subsidies that might be available to connect remote areas. The European Commission estimates that the cost of achieving all the Digital Agenda targets – to provide 30Mbps broadband for everyone and get half of homes subscribing to connections of 100Mbps or more – lies between €180 and €270 billion. The FTTH Council Europe's own estimates put the cost at the lower end of this range, at around €202 billion. Does the total amount of investment still seem insurmountable?

Financial analysts considering this issue believe that the investment is available; the real question is how to tap into it. Long-term investors, such as pension funds and the European Investment Bank (EIB), have expressed their interest in funding FTTH infrastructure. Indeed, the EIB has already made several investments in FTTH networks, including Portugal's three big operators – Portugal Telecom, Sonaecom and ZON Multimedia – and Reggefiber in the Netherlands. Unfortunately, not all FTTH projects match the investment criteria of the long-term investors, but the FTTH Council Europe intends to foster greater compatibility between the two groups.

Infrastructure investors prefer projects with low risk and strong contractual commitments. A monopoly FTTH infrastructure with a 30-year lifespan and 'anchor' tenants on long-term contracts fits that profile nicely. However, the equipment used to light up the optical fibre, which is likely to need upgrading on a much shorter lifecycle of five to seven years, bears much higher risk. One way around this issue is to separate the ownership and/or the operation of the infrastructure from the network technology, as has been done in New Zealand.

Another, slightly different problem is that a significant portion of FTTH deployment in Europe is being carried out by local organisations that are too small to attract the attention of the big institutional investors, while at the same time their investment needs are too large and too special to be handled by local banks. The FTTH Council Europe is actively addressing this problem through a series of 'Investor's Days' that bring FTTH projects and investors together to find mutually acceptable solutions. One possibility is to aggregate smaller projects into compatible groups, and then help to translate their business plans into terms

Europe's ranking of economies with the highest penetration of fibre to the home/building plus LAN



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