

THE LIGHT AGE

COMMUNICATING AT THE SPEED OF LIGHT

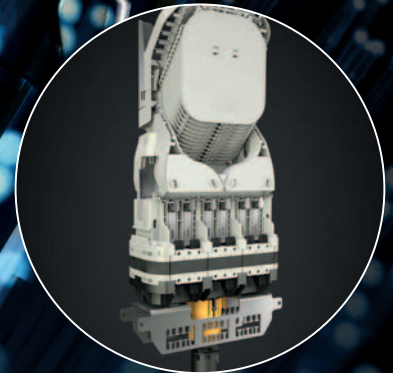
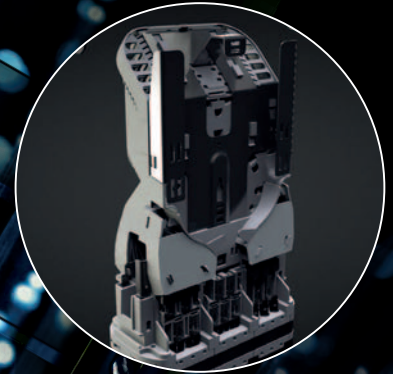
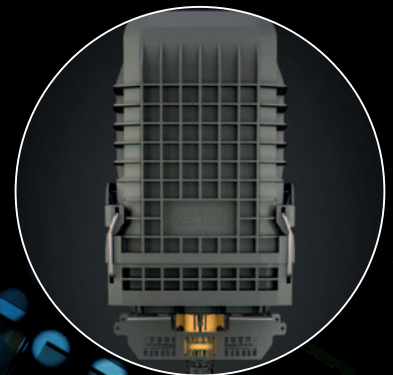
FEBRUARY 2014 • VOLUME 5



A world of applications

FTTH-enabled services will change your life

HOW DO I DRIVE FASTER NETWORK INSTALLATIONS?



TENIO – A New Way to Connect

Building on more than 30 years' experience helping build smarter, better networks, TE's new TENIO modular fiber closures simplify training, reduce inventory and enhance productivity.

To learn more, visit www.te.com/TENIO



Contents

President's Message

4 Sweden puts the fibre in innovation

By Karin Ahl

Nordic Innovation

6 Direct link to World Cup

How dark fibre will transform the way the World Cup finals are broadcast in Sweden

8 Raising our game

Broadband is allowing computer games to be sold in completely different ways

10 Home care via fibre

'Skype on wheels' is transforming patient welfare using high-speed communications

Market Analysis

12 Steady does it

Slow but steady growth characterises the recent FTTH market around the world

16 A national approach?

An evaluation of five strategic fibre models implemented in different countries

20 An infrastructure for society

Investment in Stockholm's fibre network has delivered benefits worth three times as much

Regulatory Issues

22 Future benefits?

Politicians are to debate rules aimed at making it easier to develop cross-border networks

Global Perspectives

26 FTTH Council Global Alliance

How the FTTH Councils are working together around the globe

28 The challenge of Africa

Africa's huge potential is drawing in network operators – but they face many challenges

30 Arriba América Latina!

A round-up of the state of affairs in South and Central America

32 More Gigabit users in North America

How Gigabit FTTH is rapidly gaining a foothold in the United States and Canada

34 Future-proof investments pay off

UAE's massive investment in FTTH networks has reaped rich rewards

36 A manpower problem

The Asia Pacific region is facing up to a dearth of qualified FTTH engineers



6



20



36

The Light Age is published by the FTTH Council Europe. © 2014
Rue des Colonies 11, 1000 Brussels, Belgium • info@ftthcouncil.eu

Production by Europa Science Ltd, 9 Clifton Court, Cambridge CB1 7BN, UK
Editorial and production by Warren Clark, Tim Gillett, David Houghton, Robert Roe and Tom Wilkie
www.europascience.com • info@europascience.com • +44 1223 211170

Cover: RoboLab/Shutterstock.com

Sweden puts the fibre in innovation

By Karin Ahl, President of the FTTH Council Europe



Karin Ahl

In February, Stockholm hosts the FTTH Conference 2014, the world's largest FTTH-focused event. It represents an opportunity for people from across Europe, and around the world, to come and discuss the latest advances in the deployment of fibre to the home. But it is also a chance to meet the Nordic FTTH pioneers and to get an idea of the innovative services and business models that ultrafast fibre communications makes possible.

So I am delighted to bring the conference to my home country, because we have so much to say about the advantages of FTTH. Sweden remains a front-runner in the deployment of ultrafast fibre communications technology, the creation of innovative digital services, and exploitation of open-access networks.

The theme that FTTH fosters innovation is taken up in this issue of *The Light Age*. The following pages can give the reader only a taste of the full range of possibilities. My hope is that this issue of *The Light Age* will whet the appetite of those who cannot make the journey to Sweden, and will also serve to remind those who are able to attend the conference of the advantages of ultrafast fibre.

When it comes to innovation, Sweden punches above its weight. It was ranked as the most innovative country in Europe in September 2013, using a new benchmark created by the European Commission. The "indicator of innovation output" measures the extent to which innovative ideas from key industry sectors – such as the environment, energy, ICT, health, and high-technology – are able to reach the market.

The implementation of technology is important. The act of invention or discovery isn't enough on its own. Innovation really only happens when new ideas are adopted by the market and used to enhance the quality of people's lives. The FTTH Council Europe believes – and a rapidly growing number of studies and real-world examples backs our view – that high-speed fibre to the home networks encourage innovation.

Sweden was one of the first countries to deploy FTTH networks. Today more than 22% of households in the country subscribe to fibre-to-the-home networks, which is one of the highest penetration rates in Europe. An early start in digital communications combined with a wide range of "open-access" models – where an infrastructure provider grants access to all service

providers on equal terms – laid the foundations for a vibrant and competitive broadband market.

The commercial streaming music service Spotify started at KTH Royal Institute of Technology in Stockholm, and today has more than six million active users. Magine, the streaming TV service that is often described as ‘Spotify for TV’, gained more than 500,000 subscribers in Sweden in less than a year after its launch in November 2012. The founder of Giraff Technologies, who created a telepresence device to help the elderly in their homes (see page 10), packed his bags and moved his company to the Swedish city of Västerås in 2009. Both Stockholm and Västerås built city-wide fibre networks in the early 2000s, and have since connected the majority of households directly to fibre.

It's not just about communications networks, of course. Giraff also wanted to be close to its target market – a country with a well-established social care system where looking after the elderly is a priority. Science parks are a strong feature of many universities in Sweden and the start-up culture of science parks is also an important catalyst for innovation. Incubators provide premises, mentoring, and access to funding, making it easier to start a business. Science parks “suck in” start-ups from nearby regions, even from other countries, and the pull is especially strong in areas with good communications such as Stockholm, Linköping, and Malmö.

Perhaps the best known Swedish start-up is Skype, the Internet telephony service that was sold to eBay for \$2.6 billion in 2005, then to Microsoft for \$8.1 billion in 2011. Swedish entrepreneur Niklas Zennström co-founded the company with Danish colleague Janus Friis and a small team of computer developers from Estonia. The company's story is about bringing together talented people with the resources they need – and for a start-up whose product doesn't exist without broadband, good communications are indispensable.

Mikael Danker/Shutterstock.com



“As Europe faces environmental and economic challenges, we will need more innovation and more FTTH”

As Europe faces its environmental and economic challenges, we will need more innovation and more FTTH. Why build expensive new airports and railways, when people can carry out business face-to-face via advanced video-conferencing? Let's provide more home-working opportunities; offer distance-learning services for distributed populations in rural areas; provide telemedicine and health care at home for the elderly; and create the smart grid to manage renewable energy. These services will require ubiquitous high-speed communication networks, to our businesses and to our homes.

Political stakeholders, operators, regulators, and investors must continue to work together at both national and European levels to stimulate the deployment of new FTTH networks. We cannot allow such an important part of Europe's economic future to be stifled. ●

Dr David Bosshart, keynote speaker at the FTTH Conference 2014



Events focusing on technology are the most positive ones. The most optimism today is in high-tech conferences, because there are so many opportunities. So I am very excited to be giving the Keynote address at the FTTH Conference 2014 on the subject of digital disruption vs. data wealth.

My point will be that technology isn't about technology, it's about the social side. Technology

is neither good nor bad, but it is not neutral either. Technology is an amplifier of human capabilities. It brings out our best and our worst. It can make us more efficient, more productive, but also lazy and destructive. It makes entertainment easy, but it takes away lots of jobs.

Thus new questions arise: Does better education help? What will be the meaning of creativity, when machines are

becoming creative, too? Will we need leaders, when machines are getting intelligent much faster than humans? What will tomorrow's exciting jobs be? For how many of us?

Technology makes the future unpredictable. So we need a spirit of experimentation, and people who are courageous to learn and try out new things. Digitisation is redefining

our jobs and how we get paid. There is a race going on against the machine – blue collars against robots and white collars against better algorithms.

But the real battle is about the future infrastructure and about big data!

Dr David Bosshart is the CEO of the Gottlieb Duttweiler Institute for economic and social studies (GDI), Rüschlikon, Zurich, Switzerland.

Direct link to World Cup

Dark fibre network lays foundations for ground-breaking broadcasts from Rio de Janeiro

When the city of Stockholm created the Stokab company in 1994, to provide a passive fibre optic communications network within the Stockholm region, it can scarcely have imagined that it would transform the way in which Swedish television will report the World Cup in 2014, two decades later.

Yet, because of the experience gained over the past few years using Stokab's dark fibre network, Sveriges Television (SVT), the Swedish State Television company, feels confident that its editors can sit in the control room in SVT headquarters and can carry out all the production, editing, and processing of live broadcasts from Rio, on the other side of the world. It is a stunning example of the sorts of innovations that no one could have predicted at the beginning of the fibre deployment.

At the FTTH Conference 2014 in Stockholm, Adde Granberg, Media Developer, Sport, News, and Current Affairs, will outline how SVT developed this form of

remote production, called HIPP (home IP production).

In 2006, while working for a different company, he started to cover the Stockholm marathon using dark fibre. When he started working for SVT in 2010:

"The first thing we did was to rebuild all the control rooms for broadcast TV to adapt them to dark fibre connectivity, both through IP and single mode fibre."

The aim was to take in feed from all the cameras to the broadcaster's central office in Stockholm, thus cutting down on the rental of mobile outside broadcast control rooms, not to mention the travel and hotel costs for production staff all of which have been accepted as normal in outside broadcasts.

Olympic breakthrough

According to Granberg: "The real breakthrough was the London Olympics. We had a big operation and we did all the production from the offices in Stockholm.

Everything that the viewers could see – from the studios and through the cameras – were in London but the behind-the-scenes editing, direction, and production was done in Stockholm." This allowed the company to move money from 'boring boxes' (the outside broadcast production vans/offices that it would otherwise have had to rent) to the content that could be seen on TV. "We could get more content from the Olympics in London, because of the fibre connectivity. Every single camera was connected to Stockholm. We could have a studio and more journalists on site in London, but everyone else was back in Stockholm and we used the (fibre) infrastructure to get more TV in London. We are doing the national handball league in the same way in Sweden. The national league is produced in the same way on a regular basis." SVT has been covering the Stockholm Open Tennis Tournament (part of the Association of Tennis Professionals (ATP) world tour) in the same way for the past three years.

It was, he said, impossible to do this kind of production without fibre connectivity. If the communications are routed over satellite, there is too much latency. On its own, fibre may be more expensive than satellite connectivity, but when the savings on the other costs are taken into account, then the fibre route wins out.

The production, editing and processing of matches in Rio will take place in the Stockholm studio





One of the issues is that currently there is no fixed price for renting fibre, so there is a lot of negotiating well in advance of any broadcast to secure a good price. The telecoms companies and carriers are used to renting capacity on a one-year or three-year contract, whereas the broadcaster will go in and ask just for a three-day or a week-long, or at most three-week, contract. This is a new market for the telecoms companies and they need to adapt. SVT requires dedicated capacity and needs to be assured it will be there exactly when it is needed. The estimate used to be 100Mbps per camera but, according to Granberg, the compressions are getting quicker and quicker and so the capacity requirements are diminishing. Taken together with a decrease in the price of fibre connectivity, the economics are moving in favour of HIPP.

Content is king

The biggest problem, he conceded, is not technical but is psychological and managerial. Television production staff want to have the immediacy of being on the spot themselves!

But, once such issues are sorted, the new system allows broadcasters to get more content back to their base “where they are used to handling content and can push out more content to the viewers,” Granberg added. “Maybe you would like to have a close-up of someone, or you want an extra feed (2nd screen) for the tablet or computer – so you can have

extra channels.” This is made possible because the broadcaster gets all the content back to base – whereas a local control room, sited next to the sports arena, say, will only send out one feed and, when the power for this control room is unplugged, all the content is gone.

The switch to HIPP has come gradually, as the broadcaster gained experience of what was possible and what the technical difficulties were. According to Granberg: “It really started locally in Stockholm and we opened it up when we understood what to do with it.” Stokab only offers dark fibre, so the process started with the Stockholm Marathon in 2006 “when we used dark fibre – a single mode fibre for each camera.” SVT has built equipment now that, using signal muxing, can handle 10 cameras in one fibre. However, dark fibre has a limitation of 50 to 80km, so it is fine for broadcasts from the region, but for longer distances SVT needs to rent capacity from the telecoms companies – the IP part of HIPP.

Currently the ‘home’ component of home IP production means the home base of a large broadcast organisation, rather than someone’s house or flat. But according to Granberg, that could be the next step especially for freelance producers who could work from home. “Production companies can build remote control rooms and sell this kind of remote production as a service. Or if you run an OB company (Outside Broadcast Units) maybe you should take the wheels off the van and plug in a good fibre connectivity. That’s where I can see it going. We are just at the beginning.” ●

“Everything that the viewers could see was in London but the editing, direction, and production was done in Stockholm”



Sweden leads the world in the export of games via broadband

Raising our game

Broadband is changing the way in which computer games are being sold to consumers

Sweden's excellent broadband connectivity is one reason why the country has become a highly successful developer of games. But broadband is also changing the way that consumers access games – instead of the old “packaged distribution” of CDs sold over the shop counter, gamers are going online.

Per Strömbäck, spokesperson for the Swedish Games Industry's trade association, believes that this shift offers new opportunities for the computer gaming industry. But it also creates potential conflicts of interest among network owners, carriers, Internet platforms and content creators.

Often, the debate surrounding fibre deployment

looks no further than how to get the networks installed, but the gaming industry offers a foretaste of the public policy questions that need to be addressed once the system is up and running. And for the carriers in particular, these are existential questions.

Sweden and the whole Nordic region are very successful exporters of games (see sidebar, right). In 2013, Candycrush Saga was the most downloaded free app globally, while the most downloaded paid-for app globally was Minecraft. Both are Swedish games. The success of the industry has led to the growth of specialist suppliers in graphics rendering and project management software. “I can brag a little bit about the success of the Swedish games industry,” Strömbäck said.

Investment paying off

“We are a little bit spoiled as an industry here – when we go elsewhere we are surprised and upset to discover that not all corners of the world have our broadband access. We don't really think about it,” but he conceded that it was a mind-set that can only exist in places where ultra high-speed broadband is widely available and that having this kind of network is of course a result of the investment that has been made historically.

The network infrastructure in Sweden plays several

roles in the success of the gaming industry. A lot of the games have online components that run on servers and therefore need broadband access. But game development is a team effort and broadband allows people who are geographically separated to communicate, exchange files, and discuss via videoconferencing. "There are examples of games that have been developed without the developers ever meeting in person," and that can only happen with fibre-broadband, he pointed out.

However it's not all down to technology – Strömbäck also believes that there are cultural factors. For instance: collaborative, corporate culture in Sweden has fostered the teamwork necessary for game development.

From the consumer perspective, good online access has been crucial to creating an active player community. As Strömbäck pointed out, business analyses tend to regard consumers as largely passive recipients whose contribution to a particular market segment is the money they spend. That's not really the case with the games community, he continued. The players are very active in expanding on the product, adding their own features, creating new levels, new characters and fan fiction around the content, and in sharing their views on forums and social media. "That is another aspect of the success that is empowered by online access," he said.

Double-edged sword

Good online access also helps create a functioning market. But that in itself creates challenges for the future of the gaming industry: "It's about understanding the difference between being a games developer, who focuses on creating a great game, and being a service provider who has to deal with all the issues involving regulation, age rating, customer service, legal issues and so on, that they didn't have to deal with in the old system where publishers and retailers took care of all that stuff."

The promise of the online market is for content producers to be able to sell their products direct to the consumer, without intermediaries in the distribution chain. But, as the example of the App Store shows, "That's not entirely true though. There are new intermediaries, and that has come as a surprise as we rolled out the online services." He continued: "It's a bit ironic – the promise was direct access to the consumer, but it turns out that several parties are interested in obtaining revenue from that content."

In Strömbäck's view there has not been enough discussion about the competing business interests of the distributors – who can be the Internet platforms and also the carriers – who want to charge the consumer as the content creators do. "I don't think it's because carriers want to create content, but when

they market their offers to the consumer, a big part of the message is access to content. Why do you need a 100Mbps link? The case that the carriers make to the consumers is that you can play games, download music and so on. It's the content that makes this offer appealing. At the same time, the people who create the content want a piece of the action."

Consumers have a limited amount to spend and so there is competition between the carriers, the content creators, and the Internet platforms and perhaps other intermediaries such as payment providers, or even hardware manufacturers that all want a piece of that

consumer's spending. One unintended consequence is that this may create an incentive for consumers to download pirated copies of games.

Some carriers have their own content services, and so, in Strömbäck's view, this becomes an issue about the self-image of the carriers. "They like to regard

themselves as the Post Office, a mail service with no responsibility for what happens in the fibre. But when they start their own content services, do bundled deals, and when they introduce hardware in their offerings, they are not that neutral any more. When they do their traffic management and traffic shaping they are certainly not neutral. So I think there is a big debate that is waiting to happen inside the broadband community. It is a big philosophical issue for the broadband carriers: are they merely the Post Office?"

The future, in his view, will be a complex marriage between content and infrastructure. ●

“We are a little bit spoiled as an industry here”



Playing and winning

Dataspelsbranschen, the Swedish Games Industry trade association, is a partnership consisting of the trade organisations Spelplan-ASGD (developers and producers) and ANGI (publishers and distributors). In just a few decades the Swedish gaming industry has grown from a hobby for enthusiasts into a global industry. According to Dataspelsbranschen's Game Developer Index:

- Swedish game developers' turnover grew by 60% to €414 million in 2012 – a 215% increase from 2010 to 2012;
- Most game developer companies (around 60%) are profitable and the industry reported a combined profit for the fourth consecutive year;
- Job creation and employment is up by 30%. The industry has 455 full-time positions and 1,967 employees in total;
- The number of women employed in the industry increased by 39%, resulting in a total proportion of 15%;
- The average annual growth rate from 2006 to 2012 was 34%;
- Many new companies have been created – there are now 145 active companies; and
- It is a growth industry: more than half of all the companies were registered post-2008.

Home care via fibre

Welfare Broadband pilots online care service for the elderly in their homes

Sweden's strategy for rolling out fibre broadband has led to one of the highest deployment and take-up rates in Europe, but, paradoxically, national policy turned out to be a problem when the city of Västerås wanted to use its fibre network to provide e-care services for its elderly citizens.

According to David Hjälmgård, Business Developer for local FTTH city network operator Stadsnät i Svealand: "We have developed a service we call Welfare Broadband. Västerås has come very far in using different e-services in the care of the elderly but these need high-speed communication, so we got an assignment from the local authority to develop a broadband service that can be delivered over the fibre network in the city to provide the e-care services."

Currently, three different services are provided in this way: a night-monitoring service; a video conferencing system; and a "telepresence device" that can be remotely driven around the old person's home.

Currently, carers may have to visit some older people several times during the night to check that they are in bed and have not fallen and hurt themselves. With the night monitoring system, the care service can install a camera to check remotely. This means that the safety of the elderly can be monitored as frequently as needed, while ensuring that the carers need only travel out to one of their "clients" when they are genuinely in difficulty.

"Home conferencing system"

The second service, according to Hjälmgård, is rather like an easier version of Skype. The elderly resident has a screen mounted on the wall of their home, or on a desktop, so they can communicate with the carers at the local authority. It also allows the care

services staff to check that they are all right. It is, in effect, an easy-to-use video conference system. But like the night monitoring camera, it needs the Welfare Broadband to ensure that the communications work seamlessly.

The third system is a telepresence device called "Giraff", which can be remotely driven around in the elderly person's home – "like Skype on wheels," according to Hjälmgård. To fill the time-gap between physical visits to the elderly person, the carer can call them up on Giraff and navigate the device through the home and interact with them in their home.

The local authority took the initiative in what has now developed into Welfare Broadband. Västerås, as everywhere else, is facing the issues raised by an ageing population. It is expecting a 50% increase in the number of people aged over 80 by 2029.

The situation is similar across the EU, where the percentage of people over 65 is already fast approaching 20%, and the ratio of available caregivers to the elderly requiring care will shrink from 4:1 to 2:1 over the next two decades. Social care and healthcare costs will rise as the number of older people who have to live with chronic conditions for many years rises.

In the EU, the Ambient Assisted Living (AAL) industry has emerged to try to develop and deploy technology that helps the elderly live at home safely and independently for as long as possible. The solutions deployed are intended to reduce care costs while enhancing quality of life.

In Västerås, the local authority's social care department started looking at what e-care services were available to help as many elderly people as possible to continue to live at home. After looking at the market for services available, the local authority turned to Stadsnät i Svealand to ask if it could provide the high-speed communications to deliver the services required.

A question of ownership

But there was a snag: early on, Sweden took the decision that local authorities should deploy and own

“The system can be driven around remotely – like Skype on wheels”



The 'Giraff' telepresence system in action

the fibre network and then allow anyone to access it and run content over it. But the owners themselves were restricted to charging for access and capacity – they could not themselves become a carrier, telecoms operator, or provider of content. Yet this was precisely what Västerås council wanted to do in its provision of care for the elderly!

Stadsnät is a subsidiary of Mälarenergi AB, the city-owned electric power and district heating provider based in Västerås. As Stadsnät is the FTTH provider in the region, there were legal issues with the local authority providing the Internet connection needed for the welfare e-care services to some of the residents. The solution was, according to Hjälmgården, to make Welfare Broadband an Internet connection, “but we have locked it down so it only works with the e-care services that the municipality provides.” It is not possible for any member of the public – not even the elderly in their homes served by Welfare Broadband – to plug in their own computer and use it over the system. Moreover, Welfare Broadband does not deliver other services to any other users.

The other challenge was to decide where the security layer be applied. The question, according to Hjälmgården, was: “Should we encapsulate the welfare broadband service using firewalls and other security measures, or make sure that the e-care services are secure themselves?” The issue of security and privacy had to be settled before the service could be implemented and, in the end, the decision was taken to build the security into the services and not Welfare Broadband itself.

In the relatively short term, Hjälmgården sees

two further applications for the system: “We are now looking to see if we can provide this service to retirement homes.” The issues there are slightly different from providing services to the elderly in their own homes – retirement homes have staff on site but they may well have need for back-up and support provided remotely through Welfare Broadband.

Digital switch

The second application is to switch personal emergency alarms from analogue to digital technology. Many older people wear a personal emergency alarm, as a pendant or wristband, so that if they fall or have an accident in their home they can press the button to summon assistance. These alarms are not digital, they work over the phone lines and, although they need to be tested, this is only done every 24 hours. A particularly unlucky person could have a fall and be lying there unable to sound the alarm for 24 hours. With a fibre broadband connection, however, the alarm can be ‘pinged’ constantly to ensure it is still connected.

At present, Welfare Broadband only has a limited number of ‘customers’. That was one reason the local authority turned to Stadsnät – there are too few users at present for it to be viable for a commercial company to provide the service. However, Hjälmgården is confident that it will serve as a model for other local authorities: “I get a lot of calls from other local authorities asking how we did it; what our solution looks like; and how we worked with the local authority. I think it will be rolled out in every city in Sweden.” ●

“We are now looking to see if we can provide this service to retirement homes”

Steady does it

The FTTH market still has huge potential, even if the last year has seen slower rates of adoption in Europe

Although the outlook is far from negative, this past year has seen steady growth rather than a huge increase in FTTH/B deployment across Europe. Several factors have contributed to this: continuing economic problems in Europe have meant reduced funding for such infrastructure projects; while some EU countries have made the choice of other broadband technologies.

The market research organisation IDATE has been monitoring European and global deployment of fibre on behalf of the FTTH Council Europe. In Europe, according to Valérie Chaillou, Director of Studies at IDATE: "The FTTH/B market still has a large potential. Even in countries where it has been deployed for a long time now, for instance even in Sweden, it continues to increase." She continued: "There are still some places where roll-outs still have to be done." In countries that have well-established FTTH networks, rural areas have yet to be fully connected. The updated FTTH market panorama will be presented at this year's FTTH Conference in Stockholm, but the overall picture is not expected to differ greatly from that presented at last year's conference.

At the end of December 2012, Lithuania dominated the European ranking: it led Europe with a penetration rate of more than 30%. Sweden was second in the poll,

with a penetration rate of around 22%; other members of the top five were Bulgaria, Latvia, and Norway, which all had a penetration rate of approximately 17%.

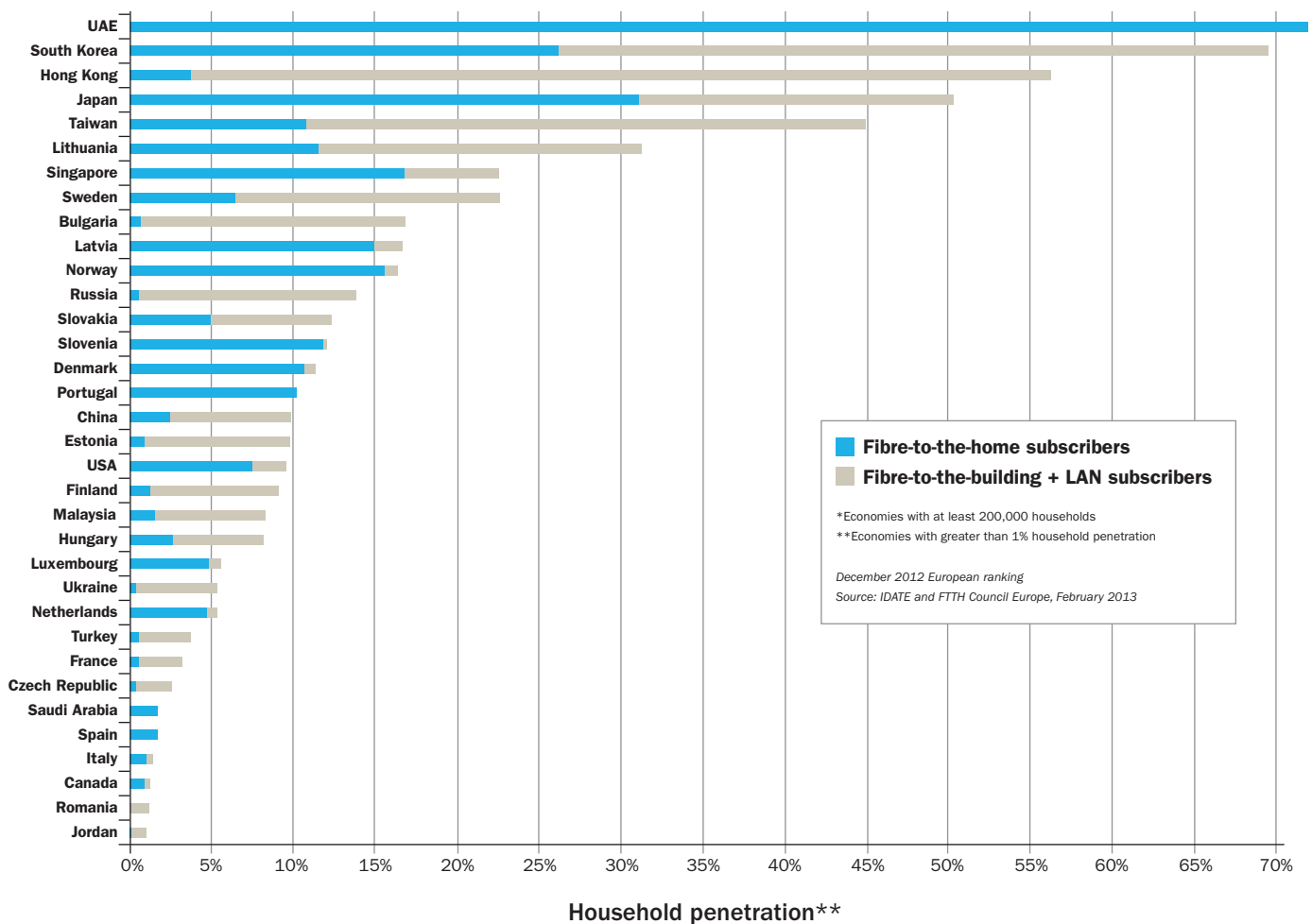
One of the interesting statistics from the FTTH ranking was the low FTTH/B penetration rates among western European countries: Italy, Spain, and France represent three of the bottom five European countries, while the UK was not even represented, as its penetration of FTTH was less than 1%. However, Chaillou pointed out that this is because some of these countries, for example the UK, have chosen different strategies for their broadband networks. "The UK is absolutely not basing [its strategy] on FTTH; there are some interesting projects led by municipalities or citizens in some rural areas, but on the national scale FTTH is absolutely not the architecture chosen."

The dominant strategy for the UK is fibre to the cabinet (FTTC), which explains why the figure for FTTH/B penetration is so low. Chaillou explained that service providers in the UK are "really betting on technology evolution – new possibilities thanks to the copper or the coaxial networks." However, she pointed out that, in the long run, these are not future-proof solutions.

Notable countries in the 2013 ranking include Turkey, which has been expanding its FTTH/B penetration



Global economies* with the highest penetration of fibre-to-the-home/building + LAN



rapidly. Ukraine and Russia have both been performing well in terms of penetration considering their large populations.

IDATE also looks at the global picture. The United Arab Emirates (UAE) has the largest penetration rates for FTTH/B in the world. This represents 72% of all households in the country subscribing to FTTH; a key feature of the UAE is that there is relatively little FTTB.

The rest of the top five consisted of Asian countries with South Korea lying in second place in the world ranking, with a penetration rate of just under 70%. It was closely followed by Hong Kong, Japan, and Taiwan which all had penetration rates of between 45 and 55%. In contrast the top European country, Lithuania, features at sixth position in the global ranking.

The lack of changes

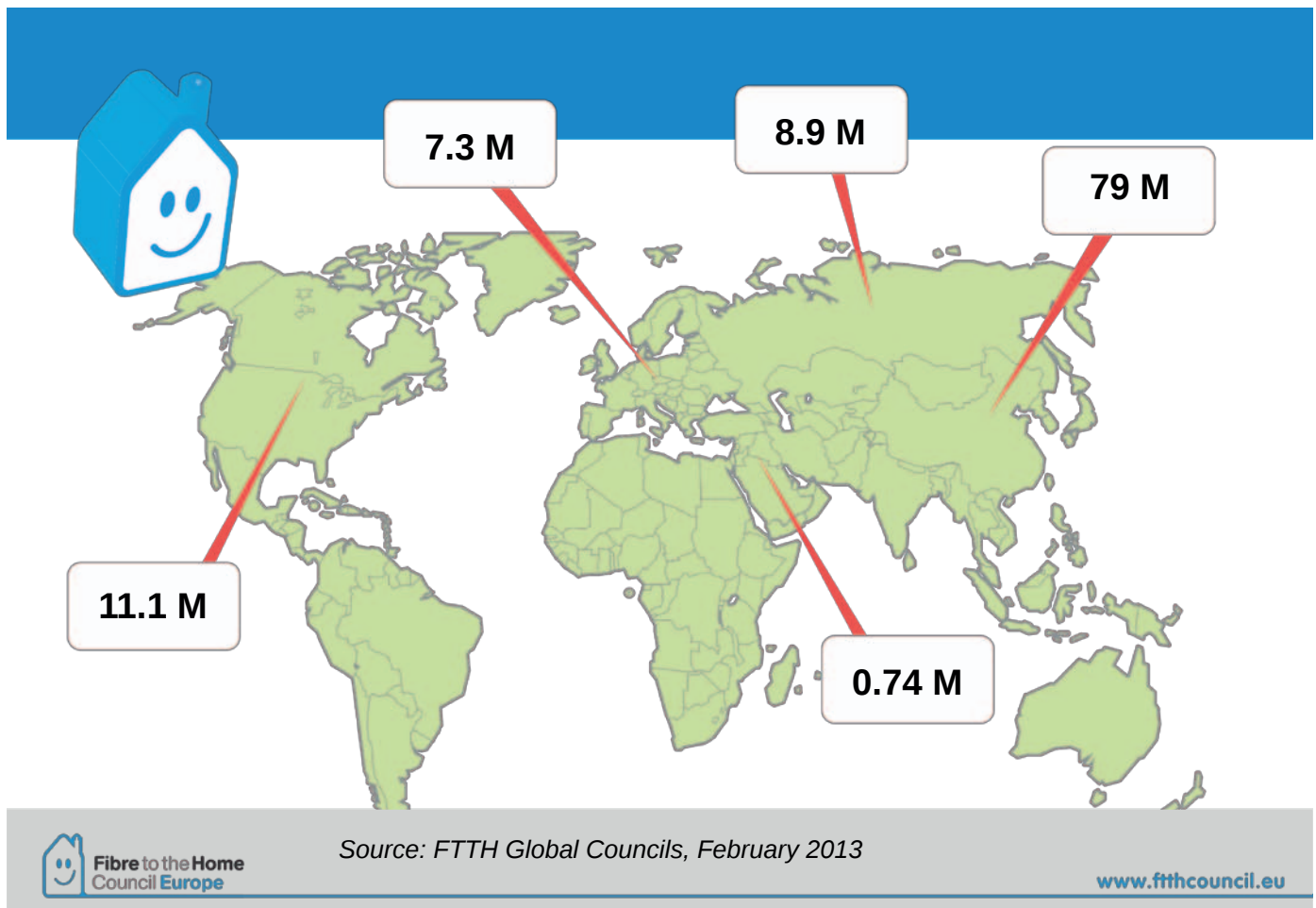
In terms of consumer uptake, rather than a sweeping adoption of FTTH/B, the reality over the past year has also been a period of steady organic growth in Europe. Chaillou explained that there are often three stages of growth after roll-outs take place, which may contribute to the slowdown in recent subscriber uptake.

Chaillou said: “The number of subscriptions can grow quite rapidly at the very beginning, because there are subscribers who are keen to change to a higher speed rate.” But, she continued: “The switch then slows down slightly because a large number of end-users just wait for new discounts in subscription packages.” The third stage is when the roll-out reaches the areas that are often less populated, such as rural areas, which are not very well covered in terms of traditional broadband. At this stage, she observed: “When the new generation networks are deployed in those areas, in particular FTTH, people are usually willing to subscribe rapidly.”

In her view, Europe is now in an intermediary stage; in some of the well-established countries slow growth will continue until there are some large roll-outs or other incentives to attract new subscribers. However, there is still room for growth in the European market as a whole, and even in some of the more established countries, she said: “I think in countries we consider as mature, such as in Scandinavia, there is still an interesting potential for growth in terms FTTH/B subscribers.”

“There is still room for growth in the European market as a whole – even in some of the more established countries”

FTTH/B Global Panorama end 2012 – total subscribers



“How can you convince end-users to change their subscription? How can a government do this?”

The digital agenda

The European Commission's Digital Agenda for Europe (DAE) aims to boost Europe's economy and help Europe's citizens and businesses to get the most out of digital technologies. Two of its goals are to achieve download rates of 30 Mbps for all citizens and at least 50% of European households subscribing to Internet connections above 100 Mbps by 2020.

In Chaillou's view, the second objective – the 50% subscription to 100Mbps or above by 2020 – will be the hardest to reach. The first part of the agenda, she pointed out, “is a question of investment” and can be completed relatively simply by spending money on infrastructure and making the services available.

But to achieve the second objective, consumers must be convinced of the benefits of super-fast broadband in order to subscribe to the service. Chaillou said: “How can you convince end-users to change their subscription? How can a government do this?”

“This is a question of communication, of information. You have to make sure that people understand the benefits of such a connection. One possible strategy is to implement pilot platforms

allowing end users to use value-added and innovative services.”

Other steps can be taken to help communication between governments and potential subscribers, such as better transparency from the cable companies about their services especially measuring the real capacity and speed of a connection. “There is a European Commission working group on that aspect and such a tool would be very useful.”

If the transparency of services was harmonised across Europe, it would provide a comprehensive tool for governments to educate people about the benefits of subscribing to super-fast broadband services, she believes.

Chaillou concluded: “Publishing a ranking, as the FTTH Council Europe does every year, is very useful, because it helps broadband stakeholders to position their country in comparison to other European countries. It provides a compelling tool for communication. Information is key: once end users are aware of FTTH-enabled services, they will be happy to pay for a faster connection, and this will contribute to reaching the second objective of the digital agenda.” ●

YOUR PLATFORM

for ultra high-speed Broadband Access: MileGate

Ethernet point-to-point with up to 1,920 subscribers per rack.

GPON with up to 5,120 subscribers per subrack.

- Maximum port density
- Maximum bandwidth
- Maximum variety of services
- Maximum power efficiency



visit us!
FTTH Conference
Stockholm, Booth G8
18 - 20 February 2014

The new FTTH CPE:

XON1200

- ◆ Flexible system concept meets modern design
- ◆ Leading edge FTTH technology in hardware and software
- ◆ Easy installation enabling end-customer setup

Next Generation FTTH

- ◆ Extensive product lines especially for FTTH network solutions based on optical Ethernet and broadcast video distribution (RF Video Overlay)
- ◆ Planning of cost-effective, reliable fiber access networks that offer optimum performance
- ◆ Development and product manufacturing with high quality standard (ISO 9001 certified)

Connecting the World at the Speed of Light



BKtel

BKtel communications GmbH
Benzstrasse 4, 41836 Hueckelhoven-Baal
Phone +49 (0) 24 33 / 91 22-0
Fax +49 (0) 24 33 / 91 22-99
E-Mail: info@bktel.com
www.bktel.com

FTTH Conference, Stockholm,
February 19 / 20, 2014, booth S16

A national approach?

A new report by Arthur D Little, entitled *National Fibre Strategies: National economic imperative or just another private industry task?*, evaluates five National Fibre strategic models

The National Fibre Strategies report sets out to evaluate five National Fibre strategic models that have been implemented around the world, and assesses how these models would achieve maximum benefit for all stakeholders, including governments, regulators and policy makers.

Broadband and economic growth

High-speed telecommunication networks are vital to healthy economies, particularly given the growth of Internet-based business transactions, email, file transfers, social networks, cloud computing, and real-time remote collaboration.

Drawing on other Arthur D Little studies that explore links between broadband services and economic growth in OECD countries, some clear conclusions can be drawn: increasing broadband

speed permanently boosts GDP; jobs are created and household income is increased.

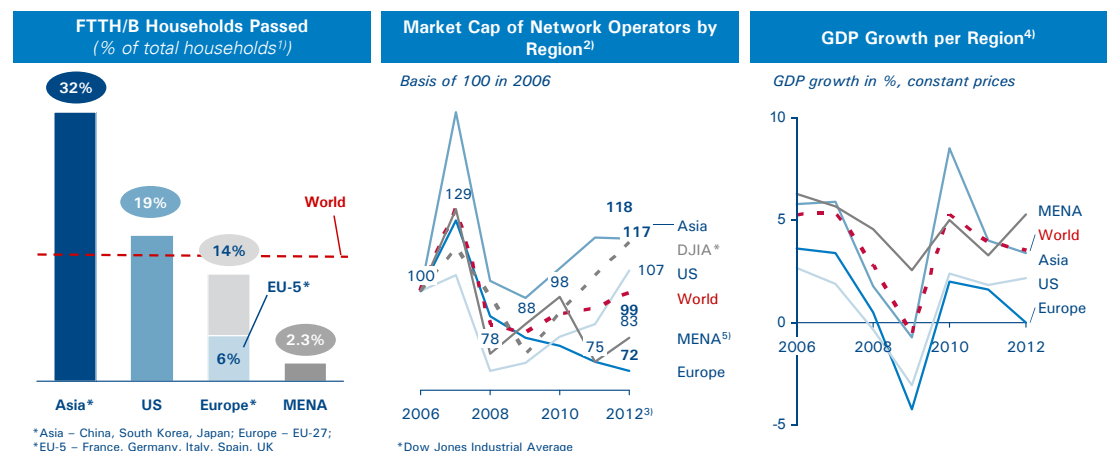
There is a correlation between fibre deployments and economic growth (as illustrated in Figure 1). In particular, high-speed networks strengthen and drive diversification of economies, as small and medium businesses (SMBs) are often the quickest to adopt and benefit from improved online business.

The challenging business case

While the socioeconomic advantages of fast fibre networks are unquestionable, the business case is often brought up as a challenge for fibre deployment on a grand scale. Largely, this is down to the fact that broadband stakeholders tend to focus on the cost of replacing infrastructure that has existed for 100 years. The FTTH Council Europe estimates that re-wiring Europe on a similar reach and scale as existing networks will cost €200 billion. In the US, Goldman Sachs estimates that at least \$140 billion is required to cover the US partially.

There is also an issue of there being no unified telecom structure in most countries. A typical developed country may have an incumbent fixed network, a challenger fixed network, four mobile networks, cable TV networks covering a large

Figure 1: Fibre deployment, Telco market cap and regional GDP growth rates



► Implementing the right national FTTH/B deployment fosters industry value generation and strengthens economic development

1) FTTH Council Presentation; Asia assumption: China - 63 mill. HHP as of June 2012 + 25 mill. HHP added for Dec 2012 figure (assumption: yearly 50 mill HHP); MENA figure as of Sep 2012; 2) In top 30 global operators, nationality according to HQ location; 3) As of Sept 28, 2012; 4) International Monetary Fund, October 2012 (Europe - EU-27, Asia - Newly industrialized Asian economies); 5) At end of 2012

proportion of the country, and an electrical power or other large utility company with a fibre network in several large cities.

Not only does this create multiple national telecom infrastructures in a single country, but it usually means that densely populated areas are served with multiple solutions, while rural locations are under-served, thus creating a 'digital divide'.

As a result, there is growing support for the notion that too much infrastructure competition is holding back fibre deployment, which in turn is hurting consumers and the wider economy.

To be robust, a National Fibre solution requires well-dug trenches that are maintainable and can be reconfigured and expanded, and make use of the latest technology while providing options to accommodate new technology in the future. Such investment can take 15 years or more to recoup, and telecom operators usually have other projects that offer a quicker return.

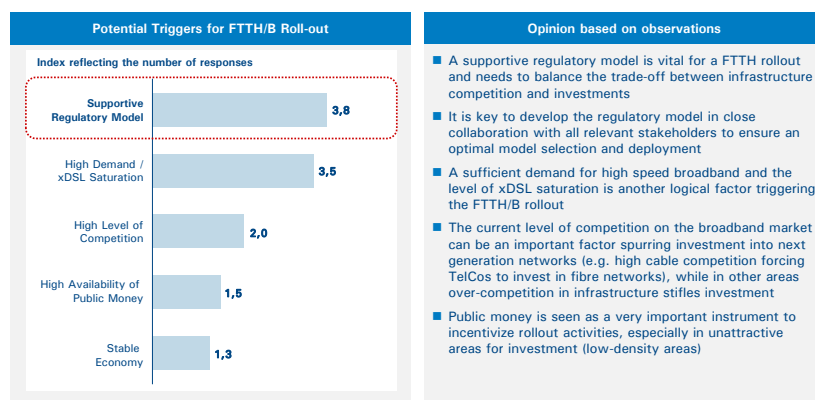
As part of the Arthur D Little Exane BNP Paribas Report 2011, more than 100 leaders in the European telecoms industry were asked for their opinions on what drives a move to fibre. Regulatory models were top of the list (see Figure 2 and article on page 22).

With public money seen as an important incentive to rollout activities, the governments need to lead industry coordination and stimulation of demand as part of their policy-making.

Five models for National Fibre strategies

Following research that assessed the National Fibre strategies of around 50 countries, Arthur D Little identified five models followed by governments (see Figure 3). Each model is a combination of regulatory intensity and degree of public investment.

Figure 2: Industry survey as part of Arthur D. Little – Exane BNP Paribas report 2011: Superfast broadband: catch up if you can



Source: Arthur D. Little -- Exane BNP Paribas 2011 Report, "Superfast Broadband: Catch up if you can"

Model 1: Private investment, unregulated

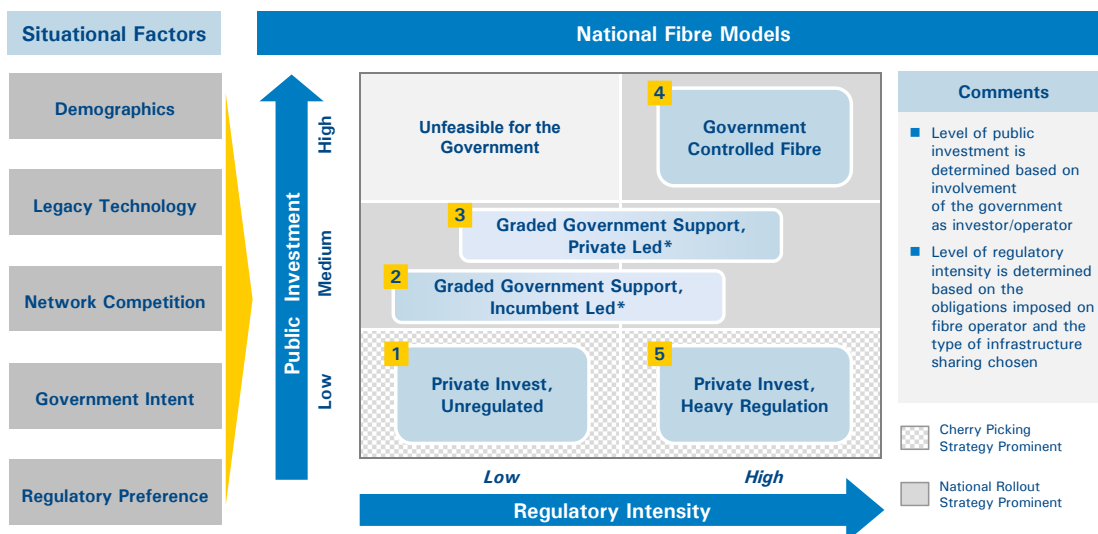
In this model, service providers are free to invest in fibre where they deem suitable. There is little or no regulatory pressure to unbundle to competitors, and no price regulation. The service providers themselves invest in fibre, resulting in good quality services and competitive prices, but only in densely-populated areas. Examples are USA and Hong Kong.

Model 2: Graded government support, incumbent-led

In this model, the incumbent operator, usually still with a significant government investment or influence, is mandated to roll out an extensive National Fibre network. Public money is involved – directly or indirectly – and some regulation on open access is

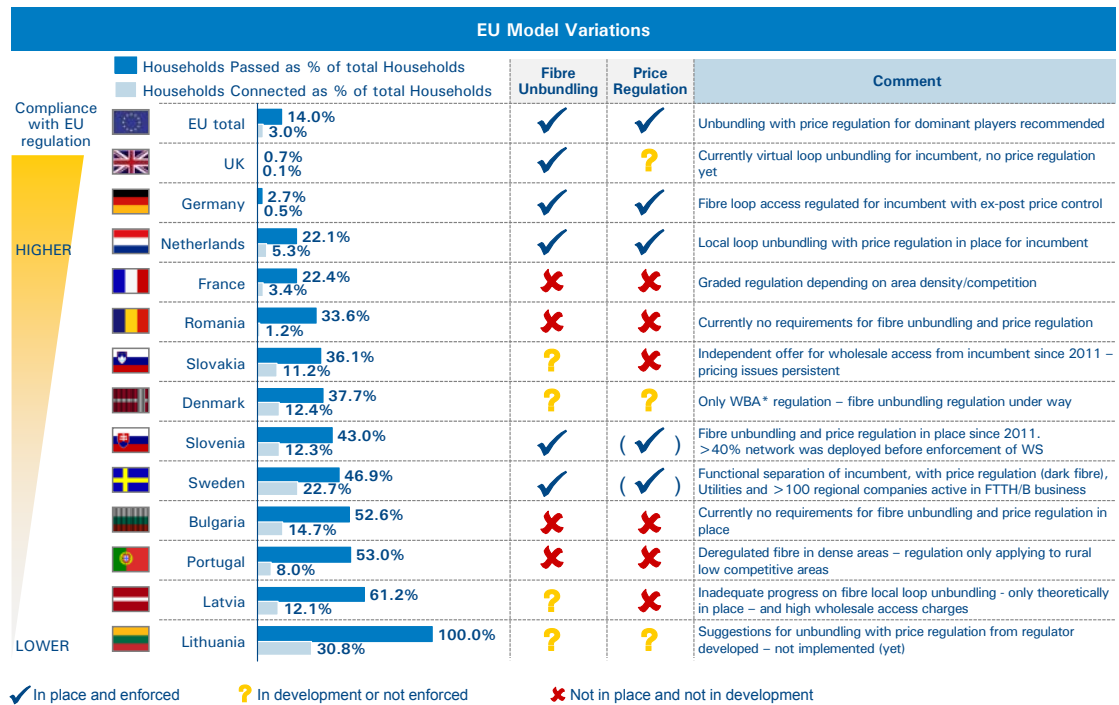
“Governments need to lead industry coordination and stimulation of demand”

Figure 3: Five National Fibre models



Source: Arthur D. Little analysis *Regulatory intensity in these models can vary from low to high depending upon situational factors

Figure 4: European national fibre penetration and degree of compliance to overarching EU fibre model (Model 5 – private investment/heavy regulation).



Source: HHP and HHC data as of Dec 2012, from FTTH council and other publicly available resources *WBA = Wholesale Broadband Access (regulation heavy in case of Slovenia, regulation put in place after deployment; in Sweden, utilities built and then sold assets to incumbent)

“ One needs to identify the best model for a specific national market, and apply that model well ”

applied. Second operators may establish a position in selected regions. The network is usually more extensive, but service level competition may be adversely impacted. This can lead to uncompetitive prices or poor service offerings. Examples are Lithuania and Latvia.

Model 3: Graded government support, private led

This model results in a more equally competitive multi-player market, where the government has distanced itself from the incumbent, but drives and partially funds a National Fibre agenda through all players. The model delivers high penetration, allowing free market forces to operate where they naturally would, and public money to be focused on areas that the free market would not otherwise service. Public coordination, target public investment and light regulation lead to healthy competition at the service level. Examples are Portugal and France.

Model 4: Government-controlled fibre

In this model, the government creates and, in some cases, operates a National Fibre network, with a view to offer or possibly transfer the infrastructure to the service providers for commercial service operation. This will achieve high penetration and a uniform standard, but presents challenges in terms of speed and efficiency of construction. An example is Austria.

Model 5: Private investment and heavy regulation

This model operates in an environment where service provider competition is strong, and where those providers believe that the fibre market has sufficient support that will attract financing easily. The model usually applies open access and regulated price controls, allowing smaller providers to offer services without significant infrastructure investment. This leads to considerable infrastructure competition that drives low prices for highly specialised services. Examples here are Germany, UK and the Netherlands.

Choosing a National Fibre model

The survey revealed that there were good and bad examples of each model, leading to the conclusion that one needs to identify the best model for a specific national market, and apply that model well.

Before establishing which National Fibre model is most appropriate, it's important to understand that individual markets have certain characteristics that dictate the level of fibre penetration. There are some overarching observations on National Fibre models, which fall into four conceptual categories: the unfitting, the fast, the unlikely, and the promising.

The unfitting: Model 5, which relies on private fibre investment coupled with heavy regulation to encourage consumer service competition, generally does not deliver fibre on any scale.

Heavy investment, long payback periods and uncertain

take-up rates often discourage the building of such networks. Indeed Europe, where Model 5 is prevalent, lags behind other regions overall.

The fast: Model 1 (private investment, unregulated) achieves a higher penetration rate than its opposite (Model 5), without the policy or regulation overhead, but is unlikely to achieve widespread coverage, thus creating a digital divide. It encourages less than efficient parallel infrastructures and hence investments, which with better coordination could achieve higher coverage at no extra cost.

The unlikely: The well-intended government-controlled network, Model 4, while probably resulting in the most uniform and widespread infrastructure, will do so at a slower and perhaps less financially efficient way.

The promising: Models 2 and 3, which adopt a hybrid approach, generally achieve the highest levels of penetration and do so in a more timely and financially efficient way than other models.

They combine free market competition, graded government coordination and geographically-targeted public investment open to competitive bid. The difference between the two is the level of competition – Model 3 is applicable for highly competitive markets, and Model 2 where a government-controlled, heavily-influenced incumbent is dominant.

The golden rules

An analysis of the most promising National Fibre markets and models has identified a number of golden rules:

- Believe that ultra-broadband is an essential infrastructure for national competitiveness.
 - Create an investment-friendly business environment and avoid heavy regulation.
 - Focus regulation on intermodal competition.
 - Capitalise on the competitive capabilities of all players in the market.
 - In many (generally larger) countries, governments need to be prepared to invest public money.
- In Models 2 and 3, there are vital success factors that underpin successful implementation:
- Combine private endeavours with graded and targeted public policy coordination and public financial incentives.
 - Establish and ensure equal and open competition for these public funds to all operators.
 - Ensure public finance is targeted to avoid distorting the natural competitive composition of the market.
 - Ensure that a transparent and symmetrical wholesale model exists for interconnection of the access networks.

As and when more favourable conditions exist, there should be actions taken in other policy areas, in order to:

- Increase national digital literacy and stimulate demand.
- Support the purchase of highly technological equipment by SMBs and consumers (e.g. tablets and laptops).
- Strengthen the ICT industrial policy.
- Nurture the venture capital ecosystem.
- Support the development of local OTT players.

The report's overall assessment (see Figure 5) points

towards hybrid models, achievable by reducing regulatory pressure and committing public money.

Conclusions

There are clear socioeconomic benefits from high-speed, low-latency, super-fast broadband, ranging from a permanent contribution to economic growth to a diversity of business ecosystems. Business challenges remain, though, as vast investment is needed. Some nations have already been successful in implementing fibre, while others – including many mature economies – are lagging significantly behind.

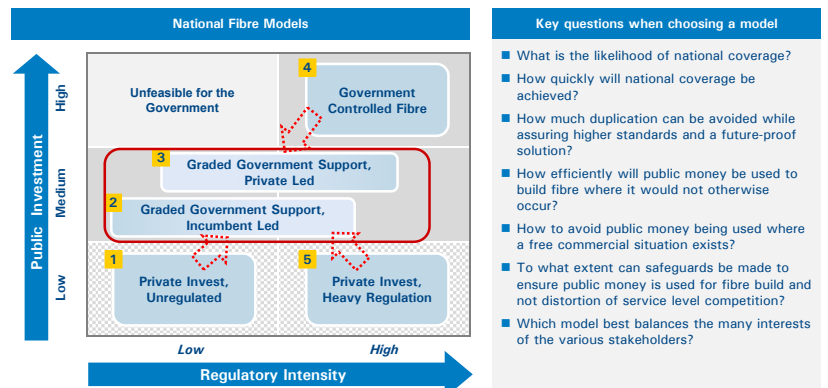
Left to free market conditions alone, nations will see a digital divide, with high-population areas well-served, but rural areas left behind. Differentiated regulation is needed that recognises the different levels of regulatory intensity at infrastructure and service competition levels.

The key success factors are:

- Reduction of regulatory pressure in order to create a more investment-friendly environment by introducing new remuneration and wholesale pricing mechanisms.
- Maintenance of cross-operator competition in fibre deployments in economically viable areas in return for an absence of regulation.
- A publicly initiated fair and open orchestration of those operators in second- and third-tier areas where free market economics can be extended with modest conditions, such as reciprocal open access between operators.
- A publicly initiated, fair and open approach with a combination of public and private funding directed to coordinated fibre build in those least economically attractive areas – again with appropriate conditions to ensure reciprocal access and the prevention of internal cross-subsidy that would otherwise distort or reduce competition in super-fast services.
- A multi-tiered, hybrid approach that differentiates between infrastructure and service-level competition can strike a balance between national economic interests, free-market economics and a healthy telecoms industry. ●

National Fibre Strategies: National economic imperative or just another private industry task?
is published by Arthur D Little. The report was written by Dr Karim Taga, Andrea Faggiano, Michael Hofner and Vidhitha Kanakamedala.
● For more information, visit www.adlittle.com

Figure 5: Balanced models combine public coordination of infrastructure competition to achieve national goals while maintaining healthy service level competition



Source: Arthur D. Little

An infrastructure for society

Investment in Stockholm's fibre network has delivered benefits worth three times as much

Over the past 20 years, since Stockholm city council set up a company, Stokab, to deploy fibre to the home across the city, the economic benefit to the region has been over three times the outlay on the network, according to a study conducted by the research institute Acreo Swedish ICT and published last year.

According to Marco Forzati, Senior Scientist at Acreo Swedish ICT and one of the authors of the study, the crucial point was the decision to create Stokab as provider of "dark fibre" so that anyone could operate or deliver services over the infrastructure: "The fact is that this infrastructure is there for anyone to use – it's an infrastructure for society – whereas in many cases elsewhere, the network is owned by one of the players that is delivering the services." Giving telecom operators and other companies and organisations access to the infrastructure has stimulated competition and innovation in services that has brought the economic benefit.

Stokab's investment in the network, up to the completion point of the study, was SEK5.4 billion

(more than 600 million euros), whereas the economic gain to the region was around SEK16 billion (around 1.9 billion euros). The study, co-authored by Forzati and Crister Mattsson, looked not only at the revenues gained by Stokab from renting out its fibre, but also cost savings for the city and county council, as well as financial benefits to business and end users.

In 2012, Stokab's customers included more than 100 telecom operators and more than 700 other companies and organisations. They were able to compete against each other by leasing fibre direct from Stokab to deliver their services rather than, as is the case elsewhere, having to lease from a company that not only owns the infrastructure but is itself delivering its own services and therefore may be a competitor. Moreover, Stokab's business model enables all its customers to define their own network structure and their leasing of the network can expand or shrink.

Knock-on effect

The cost of leasing fibre in Stockholm is less than half that (sometimes much less) in other capitals around the world. This translates into lower costs – not only for operators, but also for all enterprises that have a need for fast and reliable communications. Lower prices propagate down the value chain and stimulate new services and entrepreneurship.

Since the telecom operators all have access to the network, they compete on equal terms. This engenders fierce competition in Stockholm, leading to lower prices for broadband, compared to other European cities where competition is weaker. The study estimated that savings due to lower broadband costs for companies were approximately SEK75 million a year, as compared to what they would have paid with Copenhagen prices.

The savings to local government, alone, amounted to about SEK2 billion between 1996 and 2012, and stem directly from the ability of the city and county councils to purchase data and telecommunications services on an open market. According to Forzati: "Beforehand, they were purchasing services from the incumbent, but when the network became available they were completely free to choose to buy services from whichever service providers they wished – and that led to a very significant reduction in price." He stressed that this effect is one that the researchers

Stokab invested more than SEK5 billion in the network – but the benefits were worth much more than that



have been able to quantify, providing evidence of the beneficial effects of open market competition.

Because Stokab's investment policy has been sustained over two decades, the fibre network now connects almost all multi-dwelling units and commercial properties within Stockholm: about 90% of households and almost 100% of enterprises have the option of signing up to a fibre-based connection. An extensive backbone network connects industrial areas, major healthcare facilities, and urban centres in the region. With 1.25 million kilometres of fibre, Stockholm is one of the world's most fibre-developed cities.

Tale of two cities

Forzati drew a qualitative comparison with Copenhagen where different decisions had been made with regard to the broadband infrastructure so that the fibre in Copenhagen is owned by the incumbent telecoms operator. Although the two cities are relatively similar in terms of size, population and economic structure, there is much less fibre to the premises: barely 20% of multi-dwelling units in Copenhagen are connected, compared with more than 90% in Stockholm. The availability of dark fibre in Copenhagen was also limited, he continued, and the price higher. Forzati stressed that it was not possible to attribute differences between the economic development of the two cities directly to different strategies in their broadband development, because there were too many other confounding variables. However, he felt that "you can suspect there is a link".

In 2009, 49% of international companies chose Stockholm as the location for their Scandinavian headquarters, up from 45% three years earlier. Over the same period, the figures for the Öresund region (mainly Copenhagen and Malmö) have gone in the opposite direction: down to 35% of international companies choosing to locate their Scandinavian headquarters there compared to 41% three years earlier. Forzati stressed that the two city comparison may be suggestive but could only be qualitative.

One area in which it is possible to quantify the benefits of fibre is the increase in the value of real estate. According to Forzati: "A big chunk of the housing market in Stockholm is managed by the public sector and so there are three big housing companies that build and operate a lot of the rental property in the city. There was close collaboration between Stokab and the housing companies who have also invested in fibre themselves. Although the core network is managed by Stokab, many of the local networks are managed by these housing companies." The companies and the tenants' associations agreed before fibre deployment started that if an apartment were connected with a fibre line then the property owner was allowed to increase rent.

Forzati noted: "You can translate the higher rent as



More than 90 per cent of multi-dwelling units in Stockholm have fibre-to-the-premises connections

“The cost of leasing fibre in Stockholm is less than half that in other capitals”

increased value of the property – a higher capital value returning higher rents.” The study estimates that the increased capital value to the housing companies so far is around SEK1.8 billion and the positive effects have started to outweigh the investment costs since about 2012. There is a further advantage to the housing companies from installing fibre within their buildings – they can save on electricity, water, and heating costs due to the automation and “smart building” solutions that fibre makes possible.

Other studies have shown that high-capacity broadband leads to faster economic growth and increased job-creation, for example through the development and use of advanced services and products, as well as higher-level ICT skills more widely diffused through the population, which in turn leads to increased productivity and entrepreneurship. Acreo created an econometric model to try to quantify this effect, with a multivariate regression analysis of all the Swedish municipalities to weed out confounding factors. Although the resulting figures have high error bars, the trend is clear and the mid-point of the calculation yields an estimate of about SEK7.7 billion for “job value” which the fibre network has created in Stockholm. “There is a statistically significant effect and this is positive,” Forzati concluded.●

M. Forzati, C. Mattsson, Stokab, a socio-economic study, Acreo report acr055698, Stockholm, July 2013.

Future benefits?

European politicians are to consider new rules that could make it easier to roll out fibre networks across multiple countries

At the beginning of February, just before the FTTH Conference 2014 opens in Stockholm – but just after this issue of *The Light Age* has gone to print – the European Parliament will consider the first reading of a proposed regulation ‘to reduce the cost of deploying high-speed electronic communications networks’ in the European Union. It is one of two important initiatives that could speed the deployment of fibre to the home in Europe. The second development is the European Commission’s proposal for a Single Digital Market.

These initiatives form part of the Commission’s Digital Agenda for Europe, which is the responsibility of Neelie Kroes, Vice-President of the European Commission.

Yet political timetables are not always in step with the needs of long-term infrastructure investment. There will be European Parliamentary elections in May and, if the current Parliament does not approve these measures beforehand, the proposals will have to be re-introduced or modified for its successor, with all the attendant delays.

The first proposal should make the deployment of fibre networks in Europe easier by reducing costs, particularly in civil engineering works. The proposed regulation covers rights of way, access to empty ducts, and to dark fibre. Its scope even includes in-house cabling, as it makes provision that some sort of network should be available in newly built or even in renovated houses. In the view of Hartwig Tauber, Director General of the FTTH Council Europe: “This is a real package of measures that should help to reduce costs in Europe, but it will be important to ensure a future-proof approach that includes fibre networks inside the home.”

If the original timescale is adhered to, the first reading should be completed during the term of

the current European Parliament. However, there is some discussion as to whether the proposal should be enacted as a Directive – in which case the member states will adapt and adopt its provisions individually – or as a Regulation decided by the European Parliament and universally binding as EU law in all the member states. According to Tauber, the Commission is pushing for a Regulation as it knows that a Directive might take years to pass through the parliaments of the member states. In addition, there is a risk that some countries would adopt only the bare minimum requirements and thus the effect would be weakened. This discussion over the legal form in which the proposal should be realised is affecting the timetable for the legislation. Most of the opinion in the Parliament, too, is pushing for a Regulation and, if agreed, this could be in place by Spring 2014.

However, even if the legislative process keeps to this timetable, it does not mean that building fibre networks in Europe will suddenly and immediately be much cheaper. As Tauber points out, implementation will take time. Some of the issues will be commercially sensitive. If the law requires one telecoms operator to allow a competitor access to its ducts, then it is easy to see that there may be foot-dragging and bureaucratic delays – if the two companies are commercial



Hartwig Tauber: “Any future-proof approach for Europe should include fibre to the home.”



Symbiot/Shutterstock.com

competitors after all, they will be unused to working cooperatively. Consequently, the FTTH Council Europe sees this as a policy that will help shape the future – its benefits will not be apparent immediately on passage of the legislation, but rather over the medium term.

The FTTH Council Europe also feels that the European Commission has missed an opportunity with regard to the provisions covering newly built, or extensively renovated, premises. At the moment, the proposed regulation prescribes only that the in-house cabling should be ready to meet the EU's Digital Agenda targets. These targets are that the entire EU should be served by broadband at speeds of 30Mbps or more by 2020, and that half of the EU should be signed up to broadband faster than 100 Mbps by 2020. But standard telephone lines can easily achieve 30Mbps over a few metres inside a building. So the proposal does not provide the impetus required for fibre within the building. According to Tauber: "This was not the intention of those who wrote the package," but he believes they did not fully appreciate all the subtleties involved. The FTTH Council Europe is pushing for a stronger text so that, if anyone builds a new house or does a complete renovation of an existing building, then they should put in fibre as part

“The European Commission has missed an opportunity on the provisions covering newly built premises”

of the work, or at least ducts that would allow the installation of fibre very easily.

The second major initiative from the European Commission is its proposal for a Digital Single Market (DSM). This arose, in part, from the realisation that Europe still has 28 individual telecoms markets. If the region wants to make sure that it has international telecom carriers that can achieve a size that can compete with the AT&Ts of this world, then there needs to be a framework to make it easier for such international companies to grow and develop. Unfortunately, the DSM package was put together in rather a hurry and there is a risk that it will not address long-term requirements.

The most famous aspect of the proposal is the end of roaming fees for mobile phones. This was discussed in daily newspapers across Europe – it is one of the few aspects of the proposal that has immediate popular appeal and intelligibility. Yet, it is probably the least important aspect in the long term. Roaming fees would have come to an end by 2016 anyway, as a result of other, already existing, legislation.

The central plank of the policy is the proposal that, if an operator wants to offer network services across Europe's telecoms networks, it should be able to obtain a 'passport' or licence in one country and



“ Mobile backhaul is a major issue and only fibre can provide the bandwidth ”

operate in all European countries. This should make it easier to create truly pan-European carriers, but it is controversial because it undermines national regulations. And of course, there are fears that operators will gravitate towards those countries that have the least onerous regulations.

An important missing factor from the European Commission's proposals is a policy to promote the financing of and investment in fibre networks. Fundamentally, the Commission is trying to foster the development of digital technologies, but without being seen to try to 'pick winners' as between fibre and mobile networks for the delivery of the digital services. In September 2013, the FTTH Council Europe lamented that, as a result, the DSM was a missed opportunity, and that the Commission should be more clear-cut on future-proof solutions instead of hiding behind an out-dated idea of 'technology neutrality'.

Mobile-phone users have been demanding more and more data for many years now, and at the same time they demand a high quality of service. All this has prompted considerable innovation in radio technology – GPRS, EDGE, UMTS, WiMAX and

many more – with much of the latest effort going into deployment of LTE (Long Term Evolution) systems. LTE aims to solve the data challenge, at least for the time being, by providing higher data rates – theoretically up to 75Mbps in the uplink and up to 300Mbps in the downlink. The world's first publicly available LTE service was launched by TeliaSonera in Stockholm and Oslo in December 2009. Despite this, the Commission has explicitly identified the slow deployment of LTE as an issue to be addressed and has tried to identify areas where it can foster and speed up next generation wireless communications. As the FTTH Council Europe pointed out, fibre should similarly have been a focus of Commission policy. Indeed, mobile backhaul (provision of landline communications to mobile phone masts) is a major issue for the communications industry and only fibre can provide the bandwidth to serve the data transmission to the phone masts. In urban areas, fibre to the home, or at least fibre to the building, will be required to provide the mobile backhaul needed for wireless LTE. But because the Commission has refused to prioritise investment in fibre to the home – on the grounds of technological neutrality – it is effectively

promoting copper upgrades, even though these will not be able to support the capacity requirements of users, fixed or mobile, in the future. Tauber's view is unambiguous: 'We need a greater emphasis on future-proof fibre networks and we need to facilitate new models of financing.'

According to the FTTH Council Europe, an outlay of about €200 billion would be needed to deliver FTTH across the whole of the European Union and simultaneously meet the Digital Agenda targets, including the requirement that half of households should have ultrafast broadband subscriptions (over 100Mbps). The Council also believes that the telecoms sector cannot go it alone and that investment will have to come from outside the telecoms sector as well. Unfortunately, the Commission's proposals do not include any initiatives that could encourage such external investment nor the regulatory reforms that would promote faster network deployment and high-speed service delivery in Europe.

Part of the problem appears to be that the DSM proposal appears to have been introduced in rather a hurry and without proper public consultation. 'This may have led to some big policy misses,' Tauber added. He believes that there are few players who are entirely happy with the package. Voices within the European Parliament have also been raised in criticism of the way in which this important initiative has been handled.

At the time of writing, there are three scenarios. The first is that the DSM proposal gets a first reading in the Parliament before elections in May. In that case, it will stay on agenda for the next Parliament. The new Parliament will be able to modify the proposal, but it will eventually go through.

However, it is possible that the second reading may not take place before the elections. In this eventuality, the next Commissioner will have to decide whether to push it forward again as it stands, or to subsume it within new initiatives of their own. This latter seems the more likely scenario, if the second reading does not happen.

Intriguingly, there are rumours of a third scenario, whereby the Commission itself may withdraw the proposal and develop something new. This would be a highly unusual proceeding, and is virtually without precedent.

No developed economy can ignore digital technologies, and the European Commission recognised early on that they would be of vital importance for Europe's citizens and businesses – both in terms of economic development and personal and cultural well-being. However, as so often, the devil is in the detail and the way in which the Commission has sought to realise its over-arching vision is now dependent on political not technical factors. As events play out, the coming months will be vitally important to the future of Europe in the digital age. ●

Benefits of a digital single market (DSM) explained

At one and the same time, the Digital Agenda for Europe indicates the importance that the European Commission places on preparing Europe for the digital age, but also the confusing and slow progress of regulations and incentives across the European Union.

The DSM is just one 'pillar' of the Commission's Digital Agenda – which was launched in 2010 and which contains 101 actions, in seven 'pillars'.

The aim of the Digital Agenda for Europe is to foster the development of Europe's economy and to help both individuals and businesses to get the most out of digital technologies. It is the first of seven flagship initiatives under Europe 2020, the EU's strategy to deliver smart, sustainable and inclusive growth. According to the Commission, the digital economy is growing at seven times the rate of the rest of the economy.

The Digital Agenda set 13 specific goals:

- The entire EU to be covered by broadband by 2013;
- The entire EU to be covered by broadband above 30Mbps by 2020;
- 50% of the EU to subscribe to broadband above 100Mbps by 2020;
- 50% of the population to buy online by 2015;
- 20% of the population to buy online cross-border by 2015;
- 33% of SMEs to make online sales by 2015;
- The difference between roaming and national tariffs to approach zero by 2015;
- To increase regular Internet usage from 60% to 75% by 2015, and from 41% to 60% among disadvantaged people;
- To halve the proportion of the population that has never used the Internet from 30% to 15% by 2015;
- 50% of citizens to use e-Government by 2015, with more than half returning completed forms;
- All key cross-border public services to be available online by 2015;
- To double public investment in ICT R&D to €11 billion by 2020; and
- To reduce energy use of lighting by 20% by 2020;

After its launch in 2010, the programme was reviewed in December 2012, as a result of which seven key areas – the 'pillars' – were identified for further efforts to stimulate the conditions to create growth and jobs in Europe:

1. Create a new and stable broadband regulatory environment;
2. Encourage new public digital service infrastructures through Connecting Europe Facility loans;
3. Launch Grand Coalition on Digital Skills and Jobs;
4. Propose EU cyber-security strategy and Directive;
5. Update EU's Copyright Framework;
6. Accelerate cloud computing through public sector buying power; and
7. Launch new electronics industrial strategy – an 'Airbus of Chips'

According to the Commission, if this updated Digital Agenda was fully implemented, Europe's GDP would grow by 5%, or €1500 per person, over the next eight years, as a result of more investment in ICT, improved eSkills levels in the labour force, public sector innovation and reforms to the regulations for the Internet economy (see main text).

The Commission believes that as many as a million 'digital jobs' risk going unfilled by 2015 without pan-European action, while building the infrastructure for the digital economy would create a further 1.2 million jobs. In the long term, as many as 3.8 million new jobs would be created throughout the economy.

FTTH Council Global Alliance –

five FTTH Councils work on a global basis

The FTTH Council Global Alliance (FCGA) was founded in 2012 as a working group of all five global FTTH Councils. It implemented a series of successful projects in 2013, and is looking forward to many new activities in 2014.

The “FTTH Global Ranking” is a well-known ranking that shows the top fibre countries in the world. To ensure that the numbers are comparable and based on the same terminology, FCGA has released a special “Terms & Definitions” document. It defines important parameters such as “Homes Connected”, “Take Rate” or even basic terms such as “Fibre to the Home” and “Fibre to the Building”. Based on this, the FCGA is able to publish global market statistics which are reliable and accepted by decision-makers around the world.

Thanks to the FCGA, the exchange of best practice is possible on a global scale. This allows the FTTH Councils to provide international experience to local decision-makers, politicians, and members. By making

sure that global knowledge of mass-market roll-out of fibre networks is available, the decision process for new FTTH projects can be optimised and implementation accelerated.

The annual conferences of the FTTH Councils represent a very practical way of exchanging information for those attending. Speakers from all continents provide an extensive overview of the latest fibre developments worldwide, and share their experience on technology, management, business cases, and many other topics.

At their recent working meeting in conjunction with the Consumer Electronics Show in Las Vegas in January 2014, the five FTTH Councils drew up an extensive plan of work for the coming year. While continuing the existing cooperation, the FCGA will look for partnership with other global associations such as the ITU. It also plans to streamline still further access to global information for local stakeholders. ●

FTTH Council Contacts

FTTH Council Americas

6841 Elm Street, #843
McLean, VA 22101-0843
USA
Tel: +1 202-524-9550
Email: info@ftthcouncil.org
President:
Heather Burnett Gold
Chairman: David H. Kiel

For Latin American Inquiries:
Tel: +1 919-557-8616
Email:
latamchapter@ftthcouncil.org
Chairman: Gilberto Guitarte

FTTH Council Europe

Rue des Colonies 11
B-1000 Brussels
Belgium
Tel: +32 2 517 6103
Fax: +43 2855 71142
Email: info@ftthcouncil.eu
President: Karin Ahl
Director-General:
Prof (FH) Hartwig Tauber

FTTH Council Asia-Pacific

Email:
secretary@ftthcouncilap.org
President: Monique Morrow
General Manager:
H. Munasir Choudhury

FTTH Council Middle East/ North Africa (MENA)

Wadi Saqra Street
Building no.46
Amman, Jordan
Tel: +962 6 4621621
Fax: +962 6 4625285
Email:
info@ftthcouncilmena.org
President:
Dr Suleiman Al Hedaithy
Director General:
Christine Beylouni

FTTH Council Africa

Postnet Suite #477
PrivateBag X1007
Lyttelton 0140
South Africa
Tel: +27 12 661 1592
Fax: +27 (0) 86 579 2606
Email:
admin@ftthcouncilafrica.com
President: Richard Came
CEO: Juanita Clark



The challenge of Africa

The continent represents a huge challenge to fibre operators but the need – and market – is making the effort worthwhile



Some of the challenges of connecting Africa are illustrated by this map, which shows the continent's enormous size

Africa will see considerable investment in FTTH over the next few years, and the early financiers will reap the rewards in the fullness of time. While there is still a long way to go, the FTTH Council Africa has already seen a big change and believes that these positive trends will continue. But, according to Juanita Clark, CEO FTTH Council Africa: “We have to keep raising awareness of the importance of fibre and push regulators to remove barriers that slow down the deployment of fibre optic infrastructure.”

The need and untapped demand is there. Lagos in Nigeria, for example, has an estimated population of 21 million people, making it Africa's biggest city and that population is hungry for bandwidth. As just one instance – the cinema industry of Nigeria (colloquially referred to as Nollywood) is now said to be bigger than Bollywood and Hollywood.

Africa is vast – home to 53 independent countries, representing more than a quarter of all the countries of the world. There are 47 countries on mainland Africa and six nearby island countries. That Africa consists of so many countries in itself creates problems for the deployment of fibre networks. Clark pointed out that many of these countries are land-locked, and this by itself can slow down the physical deployments of fibre. Companies may trench up to the border of a country, but then have to wait for significant amounts of time before they can get approvals to cross the frontier with their network and get the fibre into the landlocked country.

Furthermore, each country in Africa has its own set of policies and regulations. There is no reason why they need necessarily all be harmonised, and so,



An aerial view of Lagos, home of 'Nollywood'

for an investor who wishes to promote FTTH across large parts of Africa, understanding each country's requirements is necessary but cumbersome. Africa requires a unified approach to ensure that all people have equal access to broadband, in the view of the FTTH Council Africa.

But the difficulties in harmonising government regulations and policy are very great. "In South Africa alone, there are 281 local authorities, each with a unique set of rules and regulations for the deployment of telecommunications infrastructure. This is unsettling environment for investment," Clark said.

"If Africa wants to see ubiquitous access, it needs to draw investment from telecommunications companies. It will require billions of dollars to deploy the fibre optic infrastructure required to service the needs of this continent," she continued.

Because investors seek a settled and consistent regulatory environment, "It is time that African regulators come together to discuss fibre deployments as a priority. It is a fundamental requirement for telecommunications infrastructure – from end to end fibre networks to mobile backhaul," she observed.

In Clark's view, fibre seems to have been the ugly step-sister up to now, and there is a need for regulators to take it seriously. Just as anywhere else on the globe, fibre is a critical component in all aspects of telecommunications in Africa – including mobile backhaul and wireless communications as well as FTTH networks. "Mobile phone companies cannot keep up with the demand for data anymore, and they need to invest in fibre between base stations to ensure that end users continue to receive an acceptable experience." ●

“ In South Africa alone, there are 281 local authorities, each with a unique set of rules and regulations ”

Arriba América Latina!

In Latin America FTTH is in an embryonic stage – but things are changing fast



Above, Gilberto Guitarte.
Below, Uruguay is replacing all of its copper networks and is committed to 100% FTTH coverage

Historically the Latin America region, which stretches from Mexico to Tierra del Fuego, has been largely reliant on copper-based networks – but, over the last 15 years, operators have been slowly migrating from full copper to fibre to the node (FTTN) networks in the case of telcos, and from full coax to hybrid fibre/coax cables in the case of cable operators.

The first pioneering work using fibre to the home was carried out in Chile, by the Spanish telecoms giant Telefonica, closely followed by Telefonica in Brazil, TelMex in Mexico, and Antel in Uruguay. But despite this early progress there has never been a coherent or regular policy promoting a particular technology for broadband.

Gilberto Guitarte, President of the FTTH Council LATAM Chapter, explained: 'It is a complex situation. Unlike the EU, we don't have a union in Latin America. Every country has its own regulatory

framework, its own financial conditions and its own laws. Some are promoting telecommunications using fibre, some do not.'

Figures for FTTH adoption in Latin America at the end of 2013 will be released at the FTTH LATAM Conference 2014 in Bogotá. At the end of 2012, there were 5.5 million homes passed in the region, with 741,000 FTTH subscribers. Guitarte admits that this is a very low take-up rate, but points to the huge potential market – there are 590 million people living in Latin America, so European operators are understandably very interested in developments there.

Much of the recent progress, Guitarte says, has come from private companies rather than incumbents or national utility companies – with lots of them setting up shop in smaller towns. Because they have no legacy or investment in copper-based networks they are naturally more likely to use fibre for their operations.

Guitarte says the real 'gem' in the region is Uruguay, whose centre-leftist president José Mujica has taken a keen interest in ensuring that every Uruguayan citizen has broadband access. Accordingly, the ministry of communications and the local carrier Antel are committed to 100% fibre coverage.

"It's a small country of only three million people, but this is likely to put them way ahead of everyone else", says Guitarte. "They have a clever strategy – they are replacing the old copper networks. They are not forcing the usage of fibre, but rather inviting customers to try it for 60 days. Of course nobody wants to go back to copper once they have tried a fibre connection."

Below are some outline details for the other Latin American countries that have made most progress in recent years:

● **Argentina:** There are two main carriers: Telefonica in the south of the country and Telecom Argentina





in the north. Neither is particularly interested in developing FTTH platforms, because they are not yet licenced to provide video services; so they are investing more in DSL and DSLAMs. However, Argentina has hundreds of small fibre projects ongoing, largely by independent metropolitan networks, as well as a national fibre backbone;

- **Chile:** The country has a diverse and open market, with seven operators currently competing for business. There are two main carriers involved in FTTH: Telefonica Chile and Entel Chile;
- **Brazil:** There are three big operators in this country: Telefonica Vivo, in Sao Paulo State is the biggest FTTH operator. Oi is the biggest Latin American carrier as a whole, but it largely committed to FTTH connections. The up-and-coming operator in Brazil is GVT, headquartered in Curitiba, which set up FTTH in Sao Paulo last year and is already providing serious competition to the established operators;
- **Bolivia:** There are two main operators offering FTTH: COTAS in the city of Santa Cruz, and COMTECO in the city of Cochabamba. Entel Bolivia in the capital city, La Paz, have announced they are committing to FTTH GPON from this year 2014;

- **Venezuela:** The country has seen little progress recently because of its poor economic situation but there are high hopes for the future;
 - **Colombia:** The government has recently committed to providing a full FTTH network for ETB the carrier of Bogotá, the capital city. Work started in 2013 with a target of one million homes passed and 250,000 subscribers by the end of 2014;
 - **Ecuador:** The government and local operator CNT have nationwide FTTH GPON ambitions and carried out trials in 2013. There will be active deployments in two cities – Quito and Guayaquil – in 2014; and
 - **Mexico:** Total Play and AXTEL started deploying FTTH networks in 2010, with the national operator Telmex beginning to deploy FTTH GPON networks in 2011. The company historically had a monopoly on telecoms provision and still has the majority of the market.
- While official figures are not yet available for the region in 2013, it is expected that there will be around 1.5 million subscribers in Latin America – representing a 100% increase in the space of 12 months. Correspondingly, the number of homes passed is likely to be in the region of eight million. ●

There are a wide range of operators in South and Central America

“The number of homes passed is likely to be in the region of eight million”

More Gigabit users in North America

Gigabit FTTH has been making the headlines in North America, and after a slow start providers and consumers are beginning to appreciate the technology



The first appearance of gigabit fibre to the home in the United States came around five years ago. It came to the attention of the public in the city of Chattanooga, Tennessee, as a result of an effort by the municipality to improve economic development, and a desire to test the market and use gigabit FTTH as a marketing tool by the community-owned electric company EPB.

According to FTTH Council Americas member Michael Render, of RVA Research, the project attracted significant attention from media and the fibre industry – though understandably, given the service's price tag of more than \$300 per month, take-up rates among Chattanoogaans was fairly low: "There were a few businesses that could afford it, and there were no doubt a few people who wanted to boast that they had gigabit connectivity, but that was about it." In terms of PR, however, the project was undoubtedly a success.

It was not long before other communities and companies wanted to get in on the act, and by 2011 some firms were beginning to offer gigabit FTTH at a much more affordable price (around \$70 was typical), with players such as Sonic.net conducting small trials and the arrival of Google Fiber on the scene.

Google announced its intentions to roll out a FTTH service – and, indeed, the concept was so attractive that 1,000 communities across the USA applied to become the first recipient of the service; Kansas City being chosen for development.

Render explains that progress in Kansas City was driven in two ways: Google adopting something of a 'build it and they will come' attitude with an interest in spurring both gigabit applications and more gigabit infrastructure, and an increasing demand from consumers (businesses and the public) for higher bandwidth. He continues: "There was a huge amount of interest in the media, with consumers showing an increased interest."

In figures

USA

Homes passed:
about 21,000,000

Subscribers:
11,897,000 (9,809,000 FTTH,
2,088,000 FTTB)

CANADA

Homes passed:
about 1,700,000

Subscribers:
592,000 (515,000 FTTH,
77,000 FTTB)

Figures published in September 2013



Of course, it was not long before early imitators began to spring up, especially from competitive providers. The dominant player in the sector, Verizon, already had a high-quality FTTH offering but had not yet seen the need to begin providing gigabit speeds.

Last year the competition began to hot up across the United States, most notably in Austin, Texas, where Google and its competitor AT&T have both announced plans to provide a gigabit service. Render explains: "It's going to be very interesting to see how this plays out, with two players both offering a gigabit."

"With a population of around 800,000 and a reputation as a seat of learning and a high-tech hub, there is a significant market, but it's difficult to predict what will happen. Will Google complete its build if AT&T gets in first? What will happen with two major gigabit players in one city?"

Looking to the future, Render believes the market is not currently mature enough for consumer need alone to be driving the large-scale development of gigabit FTTH, but that it will probably not be long before that point is reached: "It will be opinion leaders first, those that want to lead the way, and more and more applications – such as three-dimensional printing – demanding the extra bandwidth. It will certainly get to that point. I remember about 10 years back when the standard maximum FTTH offering was about 7Mbps, and nobody could conceive that people would use that much bandwidth!"

"People can now really start to visualise what might be possible, and the profile is rising fast. We are certainly expecting an upswing over the next few years, with further big announcements and projects to come soon." At present, the US has about 8.5% of households connected with FTTH. ●

Progress in Canada

Prior to 2010, Canada was slow to initiate FTTH in comparison to what was going on in the United States, with just a few builds from small competitive players and a smattering of networks in new property developments.

But, in 2010, mid-size incumbent local exchange companies (ILECs) such as Bell Alliant started building FTTH as a response to losing market share to other operators that had more robust broadband offerings. Render explains: "This ILEC competitive response was stronger than from US ILEC incumbents because mid-size Canadian ILEC incumbents largely don't own wireless companies – which means they don't have alternative profit sources to fall back on, and they also don't have a competing need for capital expenditures to support wireless."

In fact, over the last three years, growth of Canadian FTTH has been strong – with a penetration of new homes passed (as a percentage of total households) higher than in the USA.

Render says take up rates are currently lower in Canada than the US because small rural ILECs with high take up rates are a smaller component of the total FTTH build in Canada, and larger ILECs, which face stiff competition from cable Multiple System Operators, are only just entering the market. Currently, about 3.7% of Canada's 13.3 million households subscribe to FTTH. In terms of true FTTH, this already places it among the top 20 countries of the world.

“People can now really start to visualise what might be possible, and the profile is rising fast”

Downtown Chattanooga

Future-proof investments pay off

UAE ranked first for fibre connectivity following years of determination to take the lead



In 2012 the United Arab Emirates (UAE) was ranked number one in the Global FTTH ranking of countries with the highest penetration of fibre connectivity. This achievement was attributed to Etisalat's huge investment in network infrastructure and well-managed project execution.

Indeed, the main FTTH/B market in the UAE is dominated by Etisalat, the incumbent operator in fixed and mobile telecom services in the UAE. By the end of September 2013, it had 880,000 FTTH/B subscribers, representing a 75% market share.

The FTTH Council MENA (Middle East and North Africa) will be organising its sixth annual conference in the UAE in November 2014. A memorandum of understanding was signed in November 2013 between the FTTH Council MENA and Etisalat Academy whereby both organisations will exchange FTTH know-how in strategic workshops and technical training. "The FTTH Council MENA is really proud to have Etisalat as a platinum council member where our joint cooperation will definitely add value to both organisations. Etisalat represents the flagship of fibre deployments in the MENA region and the world leader in FTTH penetration rates," said Dr Suleiman Al Hedaithy, Chairman of the FTTH Council MENA.

In the past few years, the core focus of government policy in the UAE has been to put the country in the lead, in the delivery of digital services, e-commerce, e-government, and e-services such as education and health. To attain its policy goals, it realised that it needed to invest in new infrastructure to connect all homes and businesses. The first consideration was to achieve higher bandwidth than was attainable using the previous copper and wireless technology.

There were also some considerations specific to the country – for example, the need for a network that

would be reliable in the longer term favoured the installation of fibre, because it has a longer lifespan than copper in a hot or humid environment. There was also a desire to achieve simplification by installing one network that would serve business, consumer, and mobile backhaul demands. This was seen as a way of reducing the overall capital investment costs, as the same network could be used for several purposes – operating costs would similarly be favourable.

Some of the benefits of an investment in a fibre network were seen to be indirect – virtual communication would mean less travel and so would save energy and reduce environmental impact as well as saving money. But the investment would not just be a cost-reduction strategy – the 'Smart Home' and 'Smart City' technologies that would develop as a result of having a fibre-based infrastructure would have a beneficial socio-economic impact on people's life and work. It would, furthermore, help in the development of businesses within the UAE and contribute to improving GDP.

To ensure that the strategy was implemented effectively, the decision was made to install a point to multi-point network using gigabit passive optical network (GPON) technology. It was felt that this would make for efficient utilisation of fibre and have lower capital and operating expenditures (based on trials carried out to compare with other FTTH technologies). But a GPON would also match the UAE environment, by installing only passive equipment in the field.

The management of Etisalat decided in 2007 to go for widespread GPON deployment to cover the whole country, starting with the main cities (Abu Dhabi, Dubai, Sharjah) and with the option to migrate all legacy customers to GPON eventually. The same network was used to launch 4G, and that

“Support from central and local government helped make the deployment faster and smoother”



Aleksander Karpenko/Shutterstock.com

achieved countrywide coverage in a short period of time. Support from central and local government helped make the deployment faster and smoother. For example, new building regulations had been published in 2005, requiring all new buildings to accommodate fibre in their internal wiring.

To implement the fibre deployment, Etisalat drew up guidelines and held workshops to ensure all its units and departments were aligned to such a large scale and fast track implementation. This was followed by public awareness campaigns among all customer segments. By 2012, 100Mbps and 300Mbps Internet speeds were introduced for consumers across the UAE. The country is keeping an eye on the next generation of passive optical networks, by setting up a trial for extended and next-generation GPON systems (XGPON and NGPON).

Proper training, certification, and availability of the correct tools were the main challenges for mass roll-out. One of the most important aspects was to have a workforce that had the skills to carry out the fibre deployment. The Etisalat Academy certified more than 1,200 technicians in FTTH technology. They were mainly trained in 'last mile' connectivity, and service migration. An end-to-end lean management process was set up to ensure that customers' experience of the

new services were positive, from sale request to service closing. Management tools were introduced to ensure full automation of the order-to-bill process and control over field operations.

It was important to communicate with customers about the advantages of the service, rather than the technology, to ensure faster penetration and low resistance. Access to customers and change from copper to fibre with additional work inside customer premises was another of the challenges that had to be faced at an early stage. This was overcome by having mass communication and product brand awareness.

Having customised packages that met consumer and business requirements at a reasonable price was also an important factor. Here the added-value feature of IPTV was a key differentiator, yet the entire capability of FTTH was not fully utilised. This can be rectified by planning to have more interactive home, business services, and smart home applications over GPON.

To complete the FTTH project across the UAE, a final challenge is the difficulty of reaching rural areas. Use of mini OLT (optical line terminals) with overhead fibre is one of the options under study; while for more remote, scattered areas, LTE wireless technology is under review. ●

Skyscrapers by night in Abu Dhabi

A manpower problem

Lack of qualified engineers could prove to be a stumbling block in several countries across the Asia Pacific region



Taken as a whole, the Asia and Pacific region makes an interesting case study of the implementation of fibre to the home. Because many of the countries are at different stages in the deployment of FTTH, it is easy to pick out the incentives that work and the problems along the way. In the APAC region, we have mature markets, such as Japan and Korea, and also emerging markets such as South East Asia, China, and India. Each market has its own challenges, which can be categorised into four main types: availability of skilled manpower; civil engineering work; the willingness of customers to pay for the services that can be offered over fibre; and the strength and clarity of the government's vision for fibre deployment.

One of the key challenges is manpower or, rather, the lack of manpower with the required skills and

competency. This is a 'silent killer' for many FTTH deployments and it can make or break the project. In Australia, for example, the ABC News in 2011 forecast that the roll-out of fibre could be severely delayed because there were just not enough qualified people in the field to deploy the network. At the end of 2013, NBN, the company set up to mastermind the roll-out, reported that it had deployed only 28% of its target. One must agree that the quality of the design and planning of the networks was high, but difficulties were encountered at the level of the installation of the cable itself. The skills shortage was in laying the cables, doing the splicing and getting the service into the homes of the end users. As a result, efforts were made to recruit staff from the Philippines, Malaysia, and even from Europe to go out to Australia to do the installation, as predicted by the media back in the early stages of the roll-out. Even up-skilling current copper-based technicians requires significant investment of time and money. Manpower shortages are one key challenge that APAC has faced, is facing, and will continue to face in the future.

The second problem discernible in APAC is the challenge of civil engineering and construction work. For most countries, fibre deployment is a new build and so they do not have the infrastructure or ducts – or they have congested ducts. Fundamentally, fibre deployment is a civil engineering project – the need is to dig the ground and lay the pipes and the ducts. About 80% of the cost of FTTH is construction or civil engineering, which gives the term 'the money is in the ground' a new perspective.

Other than the cost itself, digging up the streets tends to make local residents – and local authorities – unhappy. Local resistance has delayed a lot of projects, especially the smaller ones. Large deployments tend to have prior approval at national government level, but smaller ones can have difficulties with the

Bernard Lee, Vice President for FTTH Council APAC





**APAC countries
are at varying
stages along the
FTTH route**

municipalities. Local governments can charge an extremely high levy for the right to dig up the roads. This is a very prominent issue in most developed countries with advanced infrastructure.

But the reason the APAC region is so interesting is that other countries are more advanced along the fibre deployment route, and therefore offer case studies of what the issues are after those of manpower competency and civil engineering works have been addressed. Japan and Korea, which are more mature markets in this respect, are already facing the next issues, of customer readiness and of content. Few customers have experience of the really fast speeds that fibre makes possible, so they tend to say that they do not need the extra bandwidth. Most people are only used to speeds of 5 to 10Mbps and so they believe a standard DSL will suffice, for the time being. An allied issue for the commercial telecoms companies is how they can sell fibre to the end user and make a profit. The price per Megabit in the most competitive markets, such as Hong Kong, is 3 US cents per megabit, yet the companies are providing one gigabit/second packages to end users for US\$26. This is the type of issue facing the more mature markets, because they have invested significantly into the network but

“ Simple economics is pushing the telecoms companies into offering new and innovative services ”

they are not getting the return on their investment (ROI) – how can they make money on top of that US\$26? The answer to this challenge, unfortunately, has been the most elusive.

Hence, simple economics is pushing the telecoms companies into offering new and innovative services. This is really exploratory – no one has done it before – but the companies are starting to offer comprehensive ‘smart home’ packages rather than straightforward internet packages. Some Korean telecoms companies, for example, are offering entertainment – gaming consoles and TVs – bundled with the end users’ Internet package. The point is that they are offering not only the services, but bundling in the hardware as well.

Other routes to adding value are to bundle in health services. The elderly can wear a band around their wrists that monitors their heart rate and other vital signs. The service can automatically alert the hospital or clinic if they are not moving and appear to be stationary for too long. It would even be possible to have CCTVs in the home that could check to see whether the elderly have had a fall or whether they are eating properly and taking their medication.

As these examples show, the key issue for the



A lack of skilled manpower has been a problem in Malaysia

telecoms companies is how they sell beyond bandwidth. Voice communications are not going to give them the revenue, but data and particularly mobile data communications might do. Thus they are looking at what has become known as ‘quadplay’ – quadruple play combines the ‘triple play’ service of broadband Internet access, television, and telephone, along with wireless service provisions. (This set of services is also sometimes whimsically referred to as ‘the fantastic four’.) Many of the FTTH operators sell bandwidth as mobile backhaul to the mobile phone masts and towers especially in urban areas, in order to get additional revenue from non-residential customers. This is an area into which many telecoms companies are moving, for example, because they have the network and they need to monetise it in every way possible.

The final challenge is that there are governments out there that are still deliberating whether to go with fibre or remain with copper. Evidently their awareness of the benefits of fibre is inadequate. The whole purpose of the Council is to promote fibre to the home and we will do our best to assist any government or any telecoms company to justify their investment in FTTH. We would prefer FTTH to be adopted as it is a ‘future-proof’ solution.

It is a long-term investment. But ultimately, we see

it as nation-building. The key economic consideration is ‘total cost of ownership’, or TCO. Investing in copper today requires a relatively small outlay but 10 to 20 years down the road, the total cost will be higher because copper requires regular maintenance and, after 10 years, the copper will need replacing. So in terms of the total cost of owning and operating a network for 20 years or longer, copper is more expensive. Related to this is the long-term return on investment. With the eroding price of bandwidth, it is not clear that a company would recoup its investment in copper before it needed to upgrade to fibre. Given time, fibre always prevails but that time-period is 10 years and beyond. That is why most of these projects are government-driven – the government sees the benefits for the nation and not short-term profitability.

However, it is probably worth concluding with Malaysia, one of the most successful recent FTTH projects in the APAC region. In Malaysia too, a lack of skilled manpower has been a problem and a lot of the installers have come from overseas. But Malaysia has devoted resources to training up its own staff and increased manpower to support this project. In an echo of the situation in Japan and Korea, the telecoms company has ventured into providing content – it has its own IPTV station.

Overall, the project invested RM11.3billion (US\$4bn) to provide 1.3 million home passes for the key cities in Malaysia. Thanks to this farsightedness, the network has exceeded 50% take-up – something almost unheard of – and it was achieved in three years since its launch. The Malaysian example shows there is a demand and people can see the benefit of fibre to the home. The project is now moving into a second phase – a further RM1.8billion (approximately US\$0.6bn) will be spent to add an extra million homes to the network, to bring the tally of connected homes up to two million.

Malaysia, therefore, provides an example of the typical problems and difficulties in the way of deploying fibre-to-the-home but also an example of how a country can overcome these if its government has a clear strategy and a willingness to provide the money to make it happen. ●



FTTH is being promoted as a future-proof solution

“There are governments out there that are still deliberating whether to go with fibre”

FIBRESYSTEMS

Formerly *FibreSystems Europe*

The leading publication for the optical communications industry – covering technology, applications, business and regulation

● **Subscribe now for FREE at**
● www.fibre-systems.com/subscribe



PLUS

Receive the latest news and product information direct to your inbox every month

Sign up to *FS Newsline*, our monthly email newsletter www.fibre-systems.com/subscribe



Fibre to the Home
Council **Europe**

FTTH Conference 2015

See you next year in Warsaw!
10 – 12 February 2015

www.ftthconference.eu

FTTH Council Global Alliance

Global power with regional strength

The FTTH Council Global Alliance (FCGA) is the platform for cooperation of the five global FTTH Councils. All FTTH Councils share a common goal: the acceleration of fibre-to-the-home adoption. They all act as powerful and independent organisations in their specific market. This regional focus gives the FTTH Councils a special strength to adapt their activities to the particular market situation in their area.

The FTTH Council Global Alliance ensures that those regional efforts are combined with the power of global cooperation. Within the FCGA the FTTH Councils exchange studies, information and latest market development. Joint projects – like this magazine – allow global activities and intercontinental networking.

Join the conferences of the FTTH Councils around the world:

- **FTTH Council LATAM Conference**
26-28 March 2014, Bogotá, Colombia
- **FTTH Council Asia Pacific Conference**
22-24 April 2014, Bangkok, Thailand
- **FTTH Council Americas Conference**
23-25 June 2014, Fort Lauderdale, Florida, USA
- **FTTH Council Africa Conference**
28-29 October 2014, Johannesburg, South Africa
- **FTTH Council MENA Conference**
November 2014, UAE (city/dates TBD)
- **FTTH Council Europe Conference**
10-12 February 2015, Warsaw, Poland



www.ftthcouncil.org



www.ftthcouncil.eu



www.ftthcouncilap.org



www.ftthcouncilmena.org



www.ftthcouncilafrica.org