TELECOM Review

THE TELECOM INDUSTRY'S BUSINESS MONTHLY PUBLICATION

FTTH Special Report 2016 - S 73

telecomreview.com

Fibre to the Home Council Middle East & North Africa

FTTH: Enhancing life and building a digital society

The 8th annual FTTH Council MENA conference in the Regency, Kuwait

The economic arguments for FTTH

The context of smart cities

FTTH global trends and coverage

"Enhancing life in the MENA region and building the digital society during the 8th edition of FTTH MENA conference 2016!"

Within its mission and continuous efforts, the FTTH Council Middle East and North Africa is thrilled with the FTTH technology evolution in the MENA region during the last eight years. This is due to the efforts and activities of the Council in terms of technology development to create awareness and promote the benefits to communities. Those communities are now embracing this technology due to the latest innovations, smart and virtual applications, using the solid fibre infrastructure.

With FTTH Council MENA's 8th annual conference and exhibition, we are always committed to promoting FTTH and in line with our vision is a life enhanced by fibre to the home.

Thanks to the leaders of the fibre technology and board members, Nokia, Ericsson, Prysmian Group, MEFC, OFS, Moseco and our committees and partner Ventura Team who are deeply devoted to the council achievements, we have built a platform which is today one of the most powerful communities. It's full of experts and innovators who see the importance of FTTH and have championed the adoption of the technology in a region hungry for smart services, virtual applications and realities.

Our mission is to accelerate FTTH adoption to enable new services that enhance the quality of life, contribute to a better environment and boost competitiveness.

Four committees have been watching the technology trend, looking for the best innovations and values to redirect governments and consumer behavior towards the adoption of the FTTH technology and services.

The technology and training committee launched the FOA FTTH training and FTTH strategy workshop in 2012 and certified a hundred participants. The smart cities committee participated in the global readiness guide and developed the role of FTTH in building smart cities. The regulatory and policy committee has been monitoring the national broadband strategies and dimensions for three years and contributing to the development of the council through its relationship with the International Telecommunication Union. The market intelligence and development committee is regularly assessing the FTTH market and progress to support the members' business plans and development.

Within its alliance with the FTTH Councils Global Alliance – FCGA, FTTH Council MENA continues spreading the message in MENA and in the world, exchanging knowledge and global intelligence.

We are looking forward to another successful year. FTTH Council MENA is going to thrive with its team and member's support. TR

By Christine Beylouni, Director General, FTTH Council MENA

CITRA:

Protection and progress

In an interview with Telecom Review, H.E. Salim Al-Ozainah, chairman of CITRA, shared the new regulator's objectives, talking about how CITRA will benefit Kuwait, improving its infrastructure and supporting it towards becoming a smart city.

CITRA is a very new regulator within the region. What are the objectives and vision for the new body?
CITRA objectives were highlighted clearly in Article (3) of the Telecommunications & Information Technology Law 37/2014. It says, "The Authority undertakes to regulate the telecommunications (& IT) sector and supervise and monitor it in order to enhance it in the State of Kuwait and protect the users' interests."

To achieve that, the law grants CITRA a wide range of authorities as well as responsibilities in crucial areas like: competition monitor/enhancement, frequency monitor/allocation, licensing, investment promotion, dispute resolution… etc.

Additionally, the law made CITRA responsible for market development to coop with fast technology developments worldwide.

In what new ways will CITRA be able to build on the work of the MoC over the years and what are the benefits of having a dedicated regulatory body in place?
The initial drive for privatization of communication services was undertaken by the Ministry of Communications which saw the development of private mobile operators and internet service providers. The achievements of the Ministry of Communications have been remarkable in liberalizing mobile and internet markets as well as fibre rollout at very early stages.

Furthermore, CITRA intends to build on these achievements and move towards development of a framework to liberalize other services like fixed services, international cable landing rights, international voice services, etc., which so far is a state-run monopoly.

As urged in the law, CITRA will inforce fair competition, encourage economy efficient investment and protect consumer interests.

Has CITRA been able to benefit from seeing what has worked and not worked in neighboring countries in the region?
CITRA is a new regulatory body and is working closely with regulators in the GCC region to understand best practices for the industry and their application in Kuwait. The experience of our colleagues in the region is invaluable in developing regulatory frameworks that drive innovation and efficiency.

How is Kuwait using telecommunications to position itself within the GCC and globally?
CITRA's objectives are ambitious and we are working tirelessly to exceed regional ICT benchmarks. Mobile voice and broadband connectivity are well developed in Kuwait and are already on par with global benchmarks. We intend to achieve the same level of service in the fixed network through the continued development of the FTTH network initiative started by the MOC.

What are the key initiatives that are being used to stimulate improvements in the infrastructure in the country?
CITRA is launching a range of initiatives that will encourage further development of ICT infrastructure in the country. In addition to digitization of government services through e-government initiatives, CITRA is working towards achieving 100 percent fibre connectivity with speeds of 100 Mb/s for every home and 1 gigabit/second for every business in Kuwait in the short term future.

> CITRA is launching a range of initiatives that will encourage further development of ICT infrastructure in the country

What policies has CITRA developed to encourage improved services and speeds at the access level for residential subscribers?
The Ministry of Communications is currently implementing GPON phase II which shall cover (in addition to phase I) more than 50 percent of entire households; project expected to complete in Q1/2018. On the other hand, CITRA is working very closely with the Ministry of Communications to expedite the planning and implementation of Phase III which shall cover the remaining areas of Kuwait.

How does CITRA see the development of smart cities in Kuwait and how will they be supporting such initiatives?
Smart city initiative is a strategic area of interest at CITRA. The concept of "smart city" is evolving rapidly and will touch every aspect of our lives in the near future. CITRA is working closely with global smart city initiatives to achieve our goals.

We have dedicated resources to understand and develop technologies that are relevant to Kuwait and are working to ensure that we develop a robust set of regulations that ensure smart city technologies are secure and work well together to deliver their potential benefits.

What approaches are CITRA using to encourage deployment of smart services within government and also outside it?
CITRA has a department dedicated to development of e-government services. The objective is to ensure that majority of the services offered by the government of Kuwait are made available online through use of technologies that are secure and offer a very high level of certainty, confidence and availability.

> CITRA's objectives are ambitious and we are working tirelessly to exceed regional ICT benchmarks

Does CITRA have a view on a national broadband network at this time?
Yes. CITRA is working towards bringing fibre connectivity to every home and business in Kuwait with a speed of up to 1 gigabit/second. The regulatory instruments used to achieve this are still being discussed. One of the initiatives currently being studied by CITRA is the launch of a national broadband company with an exclusive mandate to achieve last mile fibre connectivity for every home in Kuwait.

Will CITRA be looking to help the country benefit from other fibre owners such as utility companies or does the regulator prefer a more hands off approach at this time?
Neither. Last mile fibre connectivity is largely developed by the Ministry of Communications. Although there are fibre deployments by utilities, these are largely targeted for their internal use.

At the moment, CITRA is working with the Ministry of Communications to achieve fibre connectivity targets, and in the near future, we anticipate that this work will be taken over by the national broadband company. The exact legal structure and mandate of the company is being studied by CITRA and we expect to reach a decision in the very near future. TR

The national broadband & infrastructure sharing update in MENA

The FTTH MENA conference in Kuwait looks forward to the annual NBN progress report and an innovative network sharing financial impact study

Every year the regulatory and policy committee surveys developments around the region and presents them to the conference.

In Kuwait this year, are presented the results of a financial and economic impact model of a particular regulatory measure often used to support a national broadband or NBN policy - infrastructure sharing.

The 2016 status update

The FTTH Council MENA developed a policy framework which set out recommendations which could be used to promote success in a comprehensive NBN investment program. These recommendations are summarized in the following table, which may be familiar to the reader from previous years.

Policy Dimension	Essence of Recommendation
Geography: competitive v complementary	Complementary is more efficient
Copper switch off / incumbent migration	Should be guaranteed
Consistency of regulation with NBN	Aim for high consistency, but need not be perfect
Execute via incumbent or new dedicated NBN organization(s)	New, focused, organization preferable
Single v multiple NBN companies	Multiple companies to reduce execution risk
Clear, accountable, stable governance of NBN	Essential for any endeavor
Degree of structural separation	High degree of separation likely more effective
Government v private finance	Significant private finance adds discipline
USO or other ongoing contractual revenues	Universal service should be modernized to fit NBN

There have been some very interesting developments this year around the region on a number of these policy dimensions, which will be described and discussed at the conference.

Take, for example, Tunisia which does not have a full NBN policy, but is promoting a plurality of FTTH operators (the 4th policy dimension) and pushing for regulatory consistency (3rd dimension) with the policy goal of maximizing coverage by studying the best approach to infrastructure sharing – which also happens to be the subject of our financial impact study this year. The INT Tunisian regulator has just launched a consultation on infrastructure-sharing in October this year. The consultation demonstrates the wide range of sharing options that the INT is considering, making clear the difference between passive sharing and active layer sharing.

Full information on developments around the region in countries such as KSA, Kuwait, Oman, Tunisia, UAE, Qatar, Lebanon, Bahrain, etc. are shared at 8th edition of FTTH MENA conference in Kuwait including the main headlines and how they fit with the policy model:

Financial impact of infrastructure sharing

A study of the financial impact of infrastructure sharing under different scenarios in fibre deployment is also presented in Kuwait.

Infrastructure sharing is a broad term that may refer to a number of different approaches to reducing the cost of infrastructure roll-out. In its narrowest sense it refers to the sharing of active or passive infrastructure deployed by public telecommunications service providers.

In these cases, a new fiber roll-out uses assets built – or sometimes in the process of being built – for other purposes with the result that the cost of the fiber network is reduced by such "piggy backing" on these other civil works, rights of way or other assets.

Infrastructure sharing is assumed to have a major positive impact fibre infrastructure deployment. Policies to encourage infrastructure sharing are often a mainstay of any national broadband plan. However, the concrete benefits depend heavily on local conditions and the type of network roll-out under consideration.

Moreover, infrastructure sharing is not achieved without cost. The magnitude and instances in which savings occur may have significant policy implications. Yet although there have been a number of publicly available studies that have examined specific savings of infrastructure sharing in Europe, we know of none that examine MENA environments.

In the context of fiber network deployment and NBN, there are two basic types of infrastructure sharing:

- With other utilities: may include the use of infrastructure deployed by utilities, transport or other non-telco network players as well as the coordination of civil works.
- With the incumbent telecom operator, in which excess capacity of the existing national telecom infrastructure is offered up for lease for the NBN. Of course, most typically, incumbent telecoms operators do not offer such infrastructure sharing willingly. Many regulators around the world have therefore mandated incumbent access and core network infrastructure available for fibre roll-out on regulated terms and conditions.

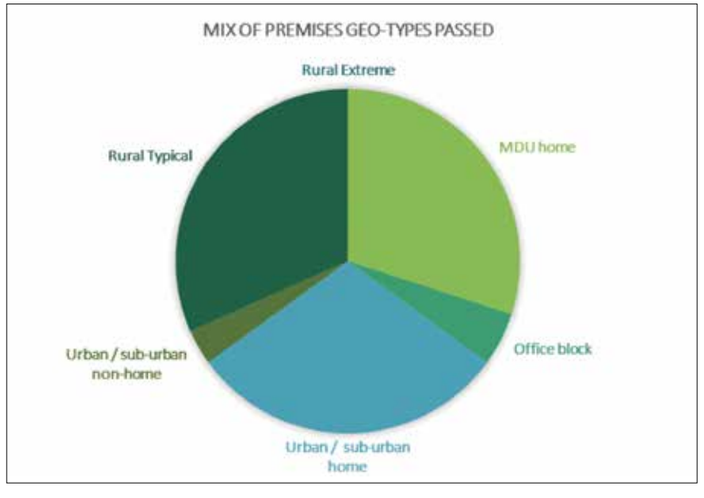
Policy Dimension	2016 Examples
Geography: competitive v complementary	An example of judicious use of national resources with mostly complementary patterns of investment between public and private sectors even as the fibre footprint grows.
Copper switch off / incumbent migration	Targets and activity shifted up this year in some countries. As before, some countries rely on market forces where there is a land-grab underway – while others drive or intervene.
Consistency of regulation with NBN	Some countries pushed infra sharing this year. This has clearly been a theme this year and looks set to continue into 2017. Regulators are tackling new, deeply practical and unprecedented issues specific to the fibre era.
Execute via incumbent or new dedicated NBN organization(s)	Approaches continue to diverge in some cases where it is relying on the incumbent and committing its first significant cash to widespread FTTH. While in contrast, some are starting the process of splitting the incumbent up to foster an open NBN infrastructure supporting multiple service providers.
Degree of structural separation	An example of work that has started on a radical regulatory and organizational change with a strong policy in this dimension and is now moving towards implementation.
Government v private finance	The process of privatizing the government incumbent which provides the right example towards this dimension.

In either case numerous factors contribute to the net benefit of infrastructure sharing, and many are highly dependent on local conditions:

1. Extent of underground plant. The more of the fibre plant that is deployed underground, the larger the overall cost of the roll-out and the higher potential cost savings from shared civil works.
2. Greenfield or brownfield. Whether the deployment takes place within a new development or where existing assets are in place will have a major impact on cost. Greenfield deployments allow for greater scope for exploiting economies of scope. Brownfield may benefit from existing asset deployment ("retro-fitting") but incur higher opex cost from leasing arrangements.
3. Nature of ground surface above the underground plant. In many cases in the MENA region, suburban or rural deployments means installation under a ground surface of sand, whereas urban may involve dealing with the same pavement issues as in another geography, yet at a significantly lower cost given the relative low cost of labor.
4. Network segment: Metro network, homes passed, final drop. The opportunities for infrastructure sharing diminish as the close the infrastructure is to the home. Yet, in terms of impact to the overall development, a greater share of cost is found in the distribution network (homes passed).
5. Density of deployment. All other things equal, denser deployment areas imply greater savings available per home passed.
6. Cost allocation. Civil works is proportionately heavy in fixed and common cost. Under such conditions, there will be many ways to allocate costs. The net benefit to the NBN will depend on what approach to cost sharing is negotiated or otherwise expressed in pricing of the share.
7. Civil Works deployment regulation. Local statutes may contain strict guidelines on how utility services are to be installed, which may increase the cost of infrastructure sharing.
8. Coordination costs. In many instances infrastructure build by utilities is conducted in parallel and not coordinated or shared simply because they are not structured to engage in cross-sectoral activities. The administrative barriers to cooperation may be very high delaying projects or raising the managerial costs to make it happen.

In order to quantify the likely gains from infrastructure in a MENA-specific manner, a financial model has been developed that uses generic based on benchmarked assumptions representative of the region for the cost of passing six different types of premise in both urban and rural areas in two distinct ways:

- Premises passed: The cost of deploying fibre past the boundary of premises varies with each case to realistically represent the geography and type of building.
- Premises connected: We also assume a cost for connecting that home or premises passed to the fibre network, but this capital cost is only incurred for those premises where a customer subscribes to the NBN.



Based on this structure, the impact of infrastructure sharing is modelled using six different geo-types and three network segments of the network for retrofitted infrastructure and different assumptions for the same geo-types and segments of the network for new greenfield new build scenarios. The mix of geo-types has been defined to be representative of the MENA region based on our analysis of housing types around the region.

For each scenario, results including cost reduction over 10 years, impact on debt and ROI, impact on prices, uplift in demand due to lower prices and net benefit to the wider economy are estimated.

With a richer understanding of the benefits of infrastructure sharing, policy implications are then revisited with the objective of shedding new light on set priorities and approaches for encouraging fibre deployment for policy makers in the region.

FTTH Council MENA is pleased to offer to the participants of the conference in Kuwait the full information and a free copy of the 2016 NBN update report. TR

By Stefan Stanislawski and Erik Withlock, Policy and Regulatory Committee, FTTH Council MENA, (Ventura Team and Salience)

FTTH Global trends and coverage

The FTTH Councils Global Alliance (FCGA) has been working hard to both monitor and promote FTTH technology and progress around the globe for a number of years.

During the 6th FCGA annual meeting hosted by FTTH Council Africa in Cape Town last July, the FCGA members from all the individual Councils set out new plans and strategies to join forces for wider promotion of, and education within, the FTTH industry worldwide. New data and figures were shared by all the regions tracking and pushing the industry forward - including the Global Ranking for 2015.

Middle East and North Africa

FTTH/B will become a widely deployed technology in the MENA region with more than 7% of total fixed broadband subscribers in MENA at the end of 2015.

The MENA region continues to develop. In 19 MENA countries, the growth reached 20% with about 2.1 million FTTH/B subscribers and 28% growth, and more than 5.2 million FTTH/B Homes Passed at the end of 2015. Two countries are still leading the region in terms of subscribers: UAE with around 1.16 million subscribers in December 2015 and Saudi Arabia with 761.66K subscribers.

Dynamism of the real estate market is a real advantage in the region: FTTH can be taken into account during the planning stage of new building

programs. Such is the case in UAE and Saudi Arabia, Qatar and even in Egypt.

Oman, Bahrain and Kuwait are expected to be the next GCC countries to begin deploying FTTH.

Outside the GCC, there are several countries where superfast broadband is expected to become a major focus in the coming years (Iran, Morocco, Tunisia, Lebanon, Iraq, Kenya). In Morocco, the first FTTH rollouts began in late 2013 and already reached 44,000 homes passed at the end of 2015, with some now able to subscribe to 50 or 100 Mbps plans with Maroc Telecom or Meditel. There is a comparable trend in Tunisia and Kenya, where three or four operators have begun deployments and/or are showing strong interest.

FTTH/B services: The region has not significantly entered the Gigabit race yet with the highest speed available only 500 Mbps in UAE. The most widespread speed rate is 100 Mbps, available in Oman, Qatar, Jordan, UAE, KSA and Tunisia.

European trends

As indicated in the FTTH Council Europe study for 2015, Europe remains an interesting market because of the underlying trends. Europe continues its structural growth: in 39 European countries, growth reached 19% with more than 35.9 million FTTH/B subscribers and 17% nearly 127 million FTTH/B homes passed at September 2015.

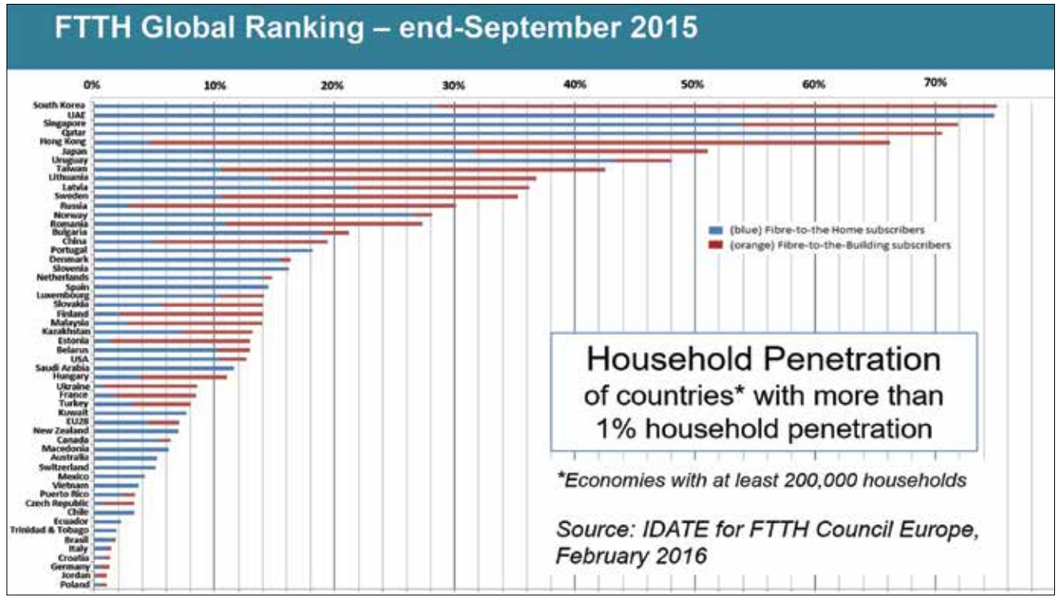
Apart from Russia, which represents the largest part of FTTH/B subscribers with 42% of total number of subscribers, the other largest markets are Spain, France, Romania with 7% of the total number of subscribers in each country.

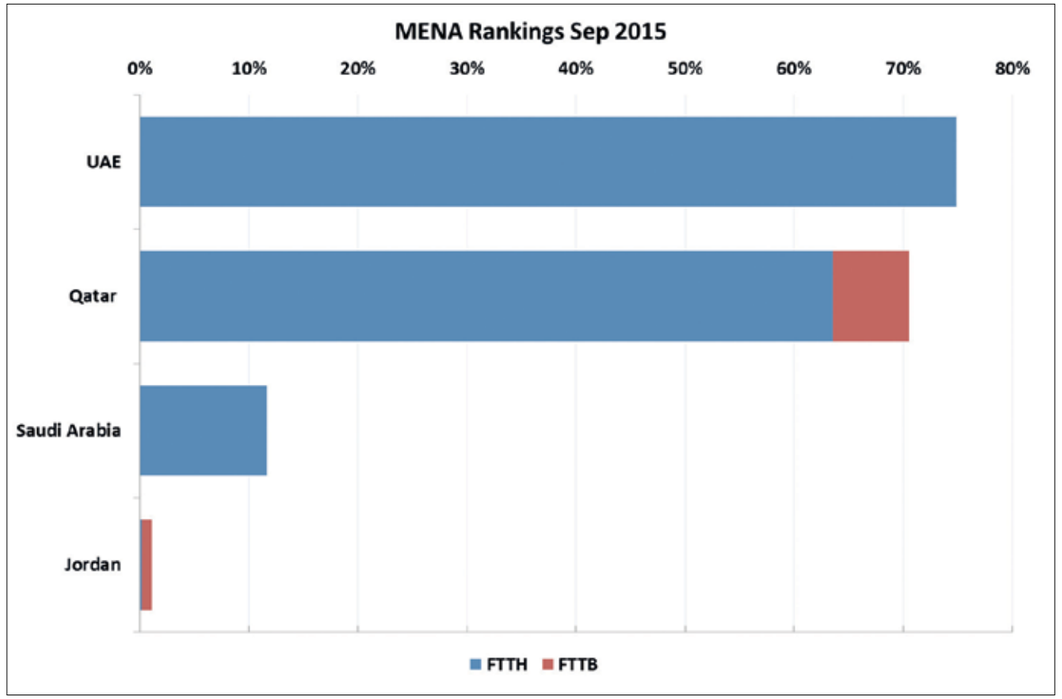
In terms of players involved in FTTH/B projects, alternative carriers are still leading the way, representing a 51% of the total homes passed in EU39 at September 2015. Their representativeness has decreased significantly compared to December 2011 where they covered 71% of the total number of homes passed in the region.

Incumbents are important players in all European countries. They represented 45% of HP in EU39 at September 2015, compared to 21% at the end of 2011.

> FTTH/B will become a widely deployed technology in the MENA region with more than 7% of total fixed broadband subscribers in MENA at the end of 2015

During the previous years, we have noted the growing involvement of incumbents and now, in all countries, incumbents are involved in at least small FTTH/B projects. Of course, some are still focusing on other FTTx architectures, but all consider that FTTH has to be part of their catalogue, in one way or another.





As a conclusion, Europe is still a region with a large potential for FTTH/B coverage expansion, although certain countries have reached a certain level of maturity.

Asia Pacific

The panorama study of the APAC council shows the region leads on NG-PON2 testing and evaluation. This is looking to the future of FTTH.

On the other hand, fibre to the antenna (FTTA) is growing for outdoor coverage to support 4G basestations and smaller cells. In addition, fibre is also being used for in-building coverage (IBC).

Fibre is now providing IoT device support and the region is seeing BBB.247 certified ONTs and BBF.069 certified devices.

The ability to support FTTA deployments means that more and more projects will combine FTTH and FTTA to help share capital costs across these different revenue sources.

The most significant trend is in supporting smart cities and their infrastructure. This will obviously include more FTTA but also effectively begin to support the wider rollout of IoT. This requires widespread access to the internet – supporting wireless based on fibre infrastructures.

AFRICA

The relatively low level of broadband at reasonable speeds in the country created a vacuum that is now being filled very quickly in developments, estates and areas of towns and cities. Alternative operators have appeared with Vumatel, leading the way in offering real open-access (multiple services from multiple operators available at the click of a mouse). Their success as the 'best' FTTH provider in the country (according to surveys) has led other operators to enter and accelerate their plans in FTTH. This is probably the most aggressive and exciting FTTH rollout in any country.

East Africa is aggressively deploying FTTH with Liquid Telecom being a key player in both Kenya and Rwanda. Google has launched Project Link in Kampala, Uganda and in Accra, Ghana.

Besides the advancements in Ghana, West Africa seems to be slower than East and Southern Africa. Namibian Telecom has a strong FTTH strategy built by the incumbent. Mauritius Telecom also recently joined the ranks of FTTH noise-makers and is aggressively targeting residents on the island.

Developments have recognized the potential increase in property values that are possible if a fibre connection is delivered that offers real choice of services. There is evidence of a 10% increase in house values in the country in these cases and there is a real bottom-up demand scenario in the country.

> Two countries are still leading the region in terms of subscribers: UAE with around 1.16 million subscribers in December 2015 and Saudi Arabia with 761.66K subscribers

LATAM

From the commercial perspective, MSOs are starting to deploy FTTH for greenfield and also where HFC infrastructure is obsolete.

From the technical perspective, Hardened Connectorisation for drops and NAPs is a trend gaining momentum in the SFU environment – accelerating and easing the HHCC installation and lowering the failure rate. For MDUs, modularity/scalability is becoming a valuable concept for CAPEX deferral.

The biggest deployments in the region are Telmex Mexico, Vivo Brazil, Antel Uruguay and ETB Colombia. These companies have defined the landscape for the topologies and architectures and sizes the scale for the technologies.

The main challenge for the SP related to infrastructure is network convergence in order to be ready to operate next generation services that will require high reliability, low latency and symmetric bandwidth.

AMERICAS

North American FTTH keeps accelerating in growth. After a dip in 2009-2011, FTTH has been growing in North America and has now reached historically high levels of deployment. FTTH provision is expected to grow even further in 2017 and 2018.

In addition, more and more providers are offering tiers of service all the way up to symmetrical Gigabit service, and are deploying 10 G networks in anticipation of the next speed push, which clearly differentiates it from all other broadband services.

There is somewhat of a land rush underway to be the initial FTTH service provider in any specific area. Competition includes major providers such as AT&T, Google, Verizon, Bell Canada and about 1,000 midsize and small providers of all types – telecom, cable and third wireline providers of various types – private, public and hybrid.

For consumers, FTTH is enabling a trend to multiple streams of ultra-high definition video, more and more uploading of files, and the increasing use of two directional video.

FTTH and Gigabit availability are also now reaching a critical mass where completely new applications are under development.

FTTH in North America is also enabling more work from home, and home-based businesses with higher revenue than similar businesses with less broadband capacity. TR

By Christine Beylouni, FTTH MENA DG and FCGA member

Global FTTH Panorama

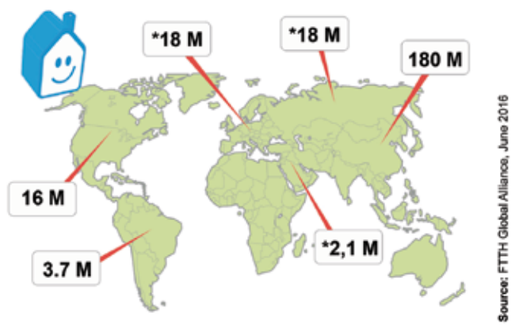
FUTURE-PROOF
1Gbps today, 10Gbps and more tomorrow using the same fibre network

ENABLER
Digital society – Smart Cities
5G backhaul
Legacy evolution

COMPETITIVE
Unbeatable 1G service offer
Premium customer experience, marketing & branding
Low OPEX (less maintenance cost)

ECO-FRIENDLY
Lowest power consumption per megabit per second

Number of FTTH subscribers worldwide



* FTTH/B subscribers at end of September 2015

The economic arguments for FTTH

The arguments for towns/cities/regions

In discussions about fibre to the home (FTTH), we hear about how expensive the capex is and how difficult this can be to justify. The continuing evolution in speeds demanded by subscribers is partly making this argument redundant as existing infrastructure in many countries cannot keep pace with volume and speed requirements. However, one aspect of these investments' high speed broadband that is typically not considered is the greater good for a town/city/country that a world class telecoms infrastructure requires.

The UAE and Qatar have been able to make investments that recognize the importance of supporting local entrepreneurs, the financial sector, etc. They have the money to invest in their vision, but the same approach would benefit countries across the GCC. If they don't invest, the disparity between the countries is unlikely to get smaller. But it's also a harder argument to make in countries that have lower 'disposable incomes' at the governmental level than UAE, Qatar, etc.

So, what can these countries expect to achieve by investment into FTTH infrastructure to support better communication services?

Work done by ADL/Ericsson/Chalmers University suggested a 0.3% increase in Gross Domestic Product (GDP) for a doubling of average broadband speed in a country. Repeating the speed increase would lead to an additional 0.3% benefit. In addition to this, the study suggests that an additional 1,000 broadband customers will create 80 new jobs.

In France, the new plan will create up to 20,000 jobs by 2022 alongside the significant upgrade to telecom services in the country.

As we consider gigabit speeds, work by Analysis Mason suggests that areas in the US with gigabit have a GDP that is 1.1% higher than areas without gigabit.

The arguments for home owners and developers

Fast fibre, preferably styled as a utility with full open access to multiple services and service providers simultaneously, drives up the value of real estate. There are a variety of benchmarks we've seen over the years including:

- +3.1% added to house values (USA)
- +7% difference in transaction price where Gigabit is available verses homes only having <=25 Mbps (USA)
- +10% increases on house prices seen in South Africa
- +5% increment on house prices in Sweden
- +11% increase claimed in the UK on house prices
- +$20,000 increment on UAE housing (prior to ubiquitous fibre availability)
- +€10,000 on homes in Ireland

The arguments for different parties in the value chain

In traditional approaches to telco operations, the operator will own the network (typically copper), will run the network and then will also deliver a limited choice of services. In some countries, the approach has evolved to a specialization at each layer of the access network.

The following diagram shows the three layers in the 'New' model while also illustrating the levels of capex and returns that may be available for each element.

The services have the lowest financial return (EBITDA) on them, but the capex is relatively low as the network is provided and run by those taking care of the active and passive layer. This has advantages for the service provider as the 'cost of entry' is lower than trying to work on all three layers – balanced by the lower returns that still enable the SPs to make a profit.

Running the active layer can deliver a 25% return, but electronics and service software costs, as well as refresh cycles for the hardware will mean there is higher investment than for the service providers.

The passive layer of fibre requires the highest investment and has a long asset life (e.g. 40 years for ducts, 25 years+ for fibre).

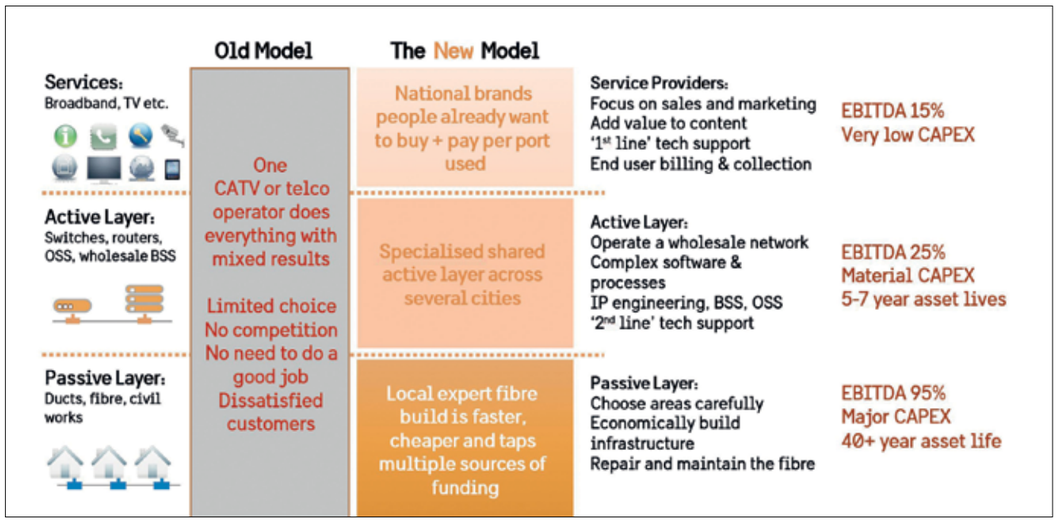
The typical returns here may be 95%, but this high return is logically needed to cover the higher capex required to build the network in comparison to running the network or delivering services over it.

Summary

The high capex of FTTH is not the only economic argument that should be considered.

This article has considered other aspects of the overall returns that can be accrued by operators, service providers and fibre owners, but in particular, those that can be delivered for towns, cities and regions.

By Richard Jones, Ventura Team



Ericsson: Empowering cities to become smart

Ammar Sabbagh, global principal consultant - Smart Sustainable City & FTTH Council MENA Board Member, discusses Ericsson's global development and the process of adopting a smart city in the MENA region.

As one of the smart cities' leaders, how is Ericsson developing globally?
Ericsson empowers cities to meet the challenges of urbanization and to achieve their full potential. We connect cities – from dense areas, indoor and underground sites to high speed commuter trains. Furthermore, our secure cloud solutions, big data analytics and agile service enablement platforms augment city services – such as smart lighting and smart parking – with mobility and connectivity. In addition, Ericsson helps leverage the value of city functions. We unlock new value by reusing a common platform – based on data sharing, connected sensors and connectivity – for different functions.

This approach enables cities to anticipate, mitigate and even prevent common urban problems. Finally, we build smart sustainable cities on a horizontal technology platform. We understand that each city is unique, and we always take a consultative approach that solves the right problems with the right solutions.

What do you see as global trends for smart cities' adoption?
We can categorize the global trends for smart city adoption into four categories:

- Explorers: These cities want to see and test smart city services to learn and develop their plans. They do this via pilots and trials for smart city applications.
- Opportunists: Cities in this category are focused on solving specific problems in the city and use silos implementation for smart city applications like smart metering, intelligent transport system, smart lighting and smart parking.
- Collaborators: Cities in this category have a vision and plan, but lack resources to implement them. These cities seek global and local partnership with private sector to implement the city vision and services, using joint financing from the private and public sector.
- Optimizers: These cities have a vision and a plan for the journey and they are executing it to transform to smart sustainable city.

What trends do you see in the MENA region from your customers' perspectives?
MENA region is very diverse and we have all of the above four categories. Most of the cities in the region are focused on collaboration, while Dubai is setting a great example in driving the optimized vision.

UAE is ranked number one in FTTH penetration rate, so it is not a surprise to see Dubai and Abu Dhabi leading the transformation to a smart city and a smart nation in the Middle East.

In your opinion, what are the synergies between governments and consumers for smart cities' development and adoption? Is there enough awareness and education for end users to adopt the smart services?
The role of people in shaping cities is changing as technology creates more smart citizens. Increasingly connected and with more location-enabled and service-related apps available to them, smart citizens are both consumers and creators of city information. At the same time, the fast-paced and far-reaching impact of ICT has increased the importance of policy change and the political leadership of cities.

Creating economic and social benefits, with a reduced environmental footprint, will first of all require forming an intention to achieve a sustainable future, setting goals and directions, and creating ICT-based follow-up systems to ensure that the road is followed.

It will not only require large investments and commitment from different stakeholders, but also changes to regulatory frameworks, cooperation between governments and industries, and strong public engagement. It is imperative that regulatory authorities provide solid new regulatory frameworks that are updated for the digital future and allow cities to grasp the potential of ICT.

What are Ericsson's initiatives to accelerate such adoption?
Successful transformations require holistic strategies, with broad engagement across stakeholder groups to harmonize expectations and approaches and to leverage the inherent strengths of ICT to provide powerful platforms, integrated systems and reusable approaches to a vast range of situations.

Experience shows that, regardless of a city's current state of development, there are very critical considerations that are necessary for its successful transformation into a smart, sustainable city:

- Define an agreed vision, strategy and targets
- Develop organizational capacity
- Engage with all relevant stakeholders
- Develop an ICT infrastructure for the smart city
- Develop priority list of smart applications to rollout and quick wins to show progress and secure funding for the smart city journey
- Select and develop a smart city index to measure the progress of your city

As member of FTTH Council MENA, how do you perceive the role of FTTH in the smart cities' deployment?
To build smart services (smart metering, public safety, smart building/home, smart stadiums, smart parking) you need to have a broadband connectivity to these buildings. Fibre is the main choice of connectivity to build a smart infrastructure for the city as we see from successful implementation of smart cities around the world.

How does infrastructure matter for Ericsson to achieve its development targets?
Smart cities are all about connectivity. By 2050, the global population will exceed 9 billion people, with 70 percent living in cities (United Nations). Ericsson empowers cities to meet the challenges of urbanization and to achieve their full potential.

We connect cities, from dense areas, indoor and underground sites to high speed commuter trains. Furthermore, our secure cloud solutions, big data analytics and agile service enablement platforms augment city services, such as smart lighting and smart parking, with mobility and connectivity.

In addition, Ericsson helps leverage the value of city functions in collaboration. We unlock new value by reusing a common platform based on data sharing, connected sensors and connectivity for different functions. This approach enables cities to anticipate, mitigate and even prevent common urban problems.

Finally, we build smart sustainable cities on a horizontal technology platform. We understand that each city is unique, and we always take a consultative approach that solves the right problems with the right solutions.

What challenges does Ericsson face during deployment?
We face challenges mainly in the field due to site issues and the

> Ericsson empowers cities to meet the challenges of urbanization and to achieve their full potential

administrative related process to secure authorization before clearing those issues (civil works blockages, buried manholes, etc.). Other minor issues are the mismatch between the existing GIS data and the data found during installation on the field.

What are the best practices in terms of deployments and operations that you see we can learn from in the GCC?

- Geo-marketing data is a crucial input for proper design of an FTTH network to secure good time to market.
- OSP network deployment shall be done 6 months to 1 year ahead of any ISP termination plan and in conjunction with survey and geo marketing data inputs.
- Any request to install OSP splitter for single customer is a reactive mode and shall be treated as operations. Operations required different SLA, different team setup and different pricing for execution, compared to projects (projects run on volume). Some clients tend to mix their operation and project needs.

> UAE is ranked number one in FTTH penetration rate, so it is not a surprise to see Dubai and Abu Dhabi leading the transformation to a smart city and a smart nation in the Middle East

What services and applications do you see stimulating customers' demand in MENA region and globally?

Smart services priorities for cusomters in the MENA region and globally are:

- Transportation services to solve traffic problems in the cities
- Public safety services to protect citizens and critical infrastructures
- Sustainability of resources like electricity and water TR

The context of smart cities

There are a number of organizations that are working to claim the smart cities 'space'. This includes the ITU, the Smart Cities Council (SCC), World Smart City Forum and others that are trying to collect and promote best practice.

In order to understand the context of the fibre nervous system without a smart city, it is useful to understand this broader context. And so, this white paper from the Smart Cities Committee of the FTTH Council MENA will explain the holistic view needed to create a fully integrated and effective set of services.

The impact of this type of thinking can't be overestimated. Ericsson suggest that mature ICT solutions could have a major impact on global greenhouse gas (GHG) emissions – potentially helping reduce these emissions by up to 15 percent by 2030. To put that into context, that reduction is around the current carbon footprint of the EU and US combined.

One key aspect of the new operational models in smart cities is the need for scalability. This is defined as the 'ability to shift to a different level of useful capacity, quickly, cost-effectively and flexibly' (Slack and Lewis 2011). We absolutely know that the only communication infrastructure that can deliver this characteristic is fibre-based networks and FTTH.

The first point to note is that the requirement of a smart city will change depending on the location. In some places the key seems to have a 'smart city' badge on a development for marketing purposes. However, where the efforts to create smart services is deeper, the town or city's situation will dictate the priorities as one size truly does not fit all.

In some under developed countries, e.g. in North Africa, maintaining a consistent power supply in some countries is a challenge, and clean water and sanitation are a priority. In other countries, these are taken for granted, but the issues may focus on other aspects such as traffic management. Dubai's world-

class efforts to create a happier and smarter society have to contend with a fast speed of urban development that leads to immense strains on the road infrastructure.

The Roads and Transport Authority (RTA) estimated that the number of vehicles in Dubai increased from 740,000 (end of year 2006) to 1.4 million (end of year 2014). This compound annual growth rate of 8.2 percent is exceptionally high. Dubai recently won the Gulf Engineering Union award at the Smart Solutions for Future Cities forum. In the face of the transport issues faced in Dubai, the automated system of transport and buses of the Dubai Roads and Transport Authority is seen as a forward thinking development. In contrast, second place in the awards was won by the renewable energies project in Kuwait. The Kuwaiti State Minister for Housing Affairs, Yasser Abdul, supports adoption of the smart cities plan for GCC countries as they consider new housing. In particular, the objective is to rationalize energy usage overall.

Each city will have its own priorities. We have discussed in a previous white paper the need to prioritize services and the pragmatic approach whereby cities should ensure that at least some of the new services are ones that are visible to citizens and are popular. A further pragmatic point is that the city should further prioritize services that are easier to implement and which generate revenues (if possible). This helps launch the city's move to smart services without the risk of citizens not recognizing the benefits of the new initiatives.

For example, high temperatures in Dubai can lead to higher pollution levels. By extending the concept of 'smart infrastructure', Dubai can use the fibre network linking sensors directly, or the ever smaller cells that provide wireless connectivity, and add air quality monitoring to street lights. This can then be accessed by apps which could check on the citizen's location to give them a local reading rather than an aggregated one for the city.

Extending the concept of smart infrastructure enables public WiFi to be added to streetlights. However, again, that really means the fibre connectivity is required at the pole.

So, how is the GCC doing compared to other parts of the world? Ericsson's networked society report ranks cities in terms of their ICT maturity against TBL which they calculate as triple bottom line (TBL) benefits of social, economic and environmental.

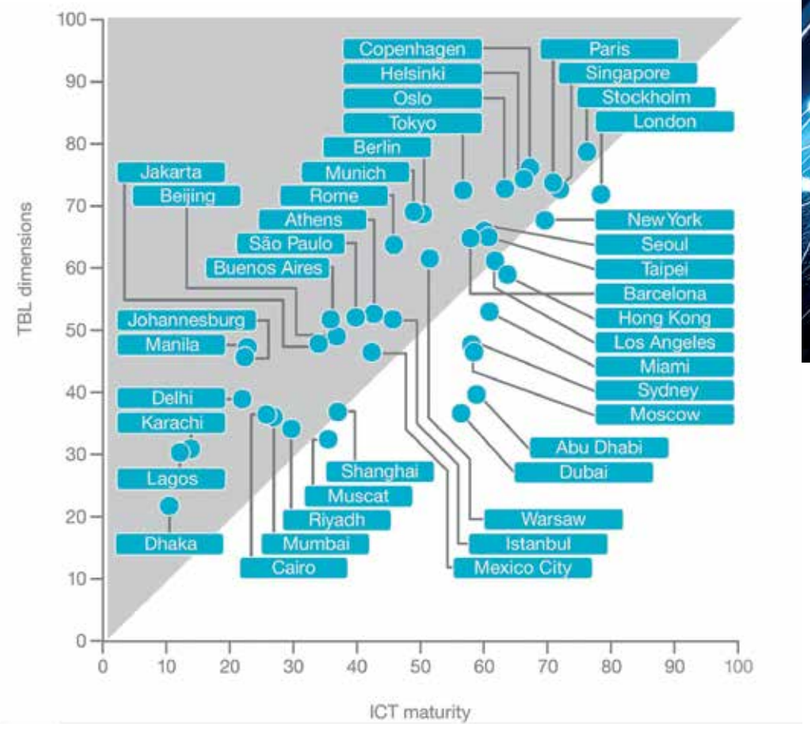
It is good to see GCC cities featuring in the top cities in the world with Abu Dhabi (23rd), Dubai (26th), Riyadh (32nd) and Muscat (33rd). Dubai is aiming to be the smartest city in the world by 2017 with the smart Dubai initiative focusing on mobility, economy, governance, people, living and environment. This includes 100 initiatives and the transformation of 1,000 services from the government transformed into 'smart' services.

It will be interesting to see how their progress moves them against Ericsson's scale in the next couple of years.

The Masdar project in Abu Dhabi is trying to balance high density living with lower use of resources. Again, the fibre network acts as the heart of great communication infrastructure, but also advanced transport solutions, combining zero emission solutions and a driverless rapid transit system.

However, in spite of these successes, overall, the average Middle East score is only 38 compared to an average of 50. This places us above only India and Sub-Saharan Africa, showing the region has a lot of work to catch up with global practice. The good news is that there are clearly many initiatives in place and a desire to close these gaps. TR

By Richard Jones, Ventura Next



Leading the FTTH development in the MENA region

In an interview with Philippe Vanhille, senior vice president Telecom Business of Prysmian Group, he explains about the opportunities and challenges facing FTTH deployment globally and in the MENA region.

How is Prysmian developing globally?
Let me start with introducing who Prysmian is. The Prysmian Group is a world leader in the industry of high technology cables and systems for energy and telecommunications with over 130 years of experience, sales of roughly 7.4 billion euro in 2015, and over 19,000 employees in 50 countries and 88 factories. Our Group offers a broad range of products, services, technologies and know-how for every type of industry, sustained through a commercial presence like in Dubai for the MENA region and 17 R&D centers around the globe.

Concerning telecommunications, the Group is also the world's leading producer of telecom cables, with a wide range of optical fibre solutions for voice, video and data transmissions.

With our continuous investment in R&D and 29 factories dedicated to this sector, we help to develop the infrastructure that supports information flows and communications between communities around the world.

A unique technology of Prysmian: our products and solutions can boost the next generation access market, providing innovative qualities from design to installation and lifespan. Customers benefit from supreme quality, speed, a simple installation process, high bend resistance and durability.

The quality of Prysmian Group's optical fibres and ground-breaking cabling solutions enable the Group to tackle the most difficult challenges and complete projects with innovative solutions.

We offer all kinds of cables, in particular high density cables with reduced dimensions thanks to the miniaturized technologies Prysmian has developed.

What do you see as global trends in FTTH deployments?
FTTH deployments are steadily growing, but the gap between the leaders and laggards seems to increase.

For example, countries in Asia Pacific remain still far higher in terms of number of FTTH/B subscribers than in any other parts of the world, with about 180 million subscribers.

Europe comes second with about 18 million FTTH/B subscribers on the European continent excluding CSI countries, which would add a further 18 million subscribers' homes to the total. America is not far behind with 16 million subscribers, but the Middle East and Latin America are regions where FTTH is only starting to develop. Some countries are very advanced in these regions and the growth potential is high.

What trends do you see from your customers' perspectives?
We see that Prysmian is requested for continuous investments for sustainable global broadband development. "The aim of the investment is to improve efficiency, provide better value to customers, increase competitiveness of fibre products and enhance production capacity to meet market demand," says Philippe.

"Fast growing data consumption is driving the market towards more fibre volume. The role of a leader such as Prysmian is, of course, to provide the requested volume. However, we must do this without compromising on quality and innovation, whilst permanently improving our fibre costing. Our investment plan is a key enabler for achieving these combined targets. We pay particular attention to optimization of our fibre manufacturing processes, realized through, for example, higher production yields and larger preforms."

"The quality of the passive elements of an optical infrastructure is absolutely key to guarantee the sustainability of the telecom service and also to optimize the total cost of ownership of the network," Philippe adds.

"The closer the fibre gets to the premises, the more passive components' quality becomes critical to avoid service disruptions and high cost of ownership. We consistently keep on investing in optical innovation, in order to permanently improve the performance of our products and processes. Our mission is to provide the market with the best solutions, creating concrete value for our customers."

In other words, the choice of optical fibre, provided that the appropriate choice of components is also made, has a number of very positive implications.

Again, investing in infrastructure that holds the highest chances of still being able to cope the connectivity needs, 20-30 years from now, with digital economy in a much more mature phase is very critical.

What are the more effective operators' strategies in MENA?
Most countries in the Middle East and North Africa (MENA) are in the emerging and developing phases.

However, the demand for broadband services is strong and increasing, therefore, broadband markets in the region are expected to grow significantly.

FTTH development can dramatically increase the production and use of digital content in MENA. What's more, connectivity may bring global knowledge to the region.

By supporting integrating professional networks across MENA, broadband introduction is expected to help bring global jobs to local markets, thereby enhance job creation opportunities.

A national backbone infrastructure based on fibre optic technologies could play an essential role in developing of broadband access and maintaining high standards of quality in the provision of broadband services.

It is worth noting that broadband services are unlikely to be commercially viable outside the major cities of MENA countries, due to lack of fibre backbone networks. These help aggregate increasing data traffic, thereby reducing average costs.

Deployment of new fibre infrastructure is a great investment challenge for operators all over the world. In the case of MENA, new investment models will play a key role in pushing commercial viability throughout the region.

What changes to deployments should operators make to improve speed, cost and quality?
Costs of installation and maintenance. The rollout of optic fibre networks entails an important capital expenditure (CAPEX) phase. This entails the installation of ducts and cables, fibre splicing and carrying out final controls. For FTTH in particular, such costs may add up.

As a result, operators may prefer to limit build-out of the optic fibre network in the initial phase. Quality differences between components during the installation phase will have considerable effects on later operating and maintenance costs (OPEX). Particularly important when considering networks that have an expected lifespan of some 30 years.

Future OPEX can be reduced considerably by selecting standardized, bend-insensitive fibre as well as optical cable designs that protect that fibre against contact with hard buffering materials.

Homogeneity of the network. To keep down total costs in the long run, it is also important to ensure the network homogeneity. This promotes interoperability, reduces the need for training and cuts long-term maintenance costs.

Significant commitment is required to ensure that the necessary work on standardization is performed, ensuring consistency and interoperability of the relevant infrastructure.

This will also bring down training and maintenance costs. Human capital investments in well-trained and effective teams who can competently maintain the network don't need to be repeated for different technologies and systems. TR

Fibre applications and evolution

Fibre to the home has made significant progress in deployments across the world. The FTTH Council MENA has actively worked in the MENA region to be a catalyst for FTTH certified trainings and technology awareness and creating an ecosystem for FTTH adoption and deployment.

In Asia pacific and in North America, we see significant deployments with increased penetrations to meet bandwidth demand for intensive applications. We see also Europe and MENA and Latin America and Africa adopting fibre technologies at an accelerating rate, realizing the value of fibre in meeting demands for bandwidth evolution and delivering significant value for total cost of ownership in terms of capex optimization and opex reductions.

We can see that the applications of FTTH have stretched to encompass several domains including home connectivity to provide intensive and multimedia rich services and video dominated internet. It also provides an optimum solution for enterprise connectivity to cater for highly reliable and symmetric services with ease of bandwidth upgrade to Gigabit speeds. Mobile backhauling is an important application where we are seeing more and more the adoption of fibre to backhaul 4G and 5G technologies.

FTTH has become a common factor for access networks to connect backhaul fixed and mobile applications, and provides the needed characteristics to answer the future evolution and service demands by businesses and households.

Several differentiators characterize the application in fibre for fixed and mobile aggregation and backhaul. Fibre symmetry is becoming more dominant in today's services and consumer network behavior. When it comes to maintaining tight delay and delay variations, fibre has a superb performance that is so much better than other access media.

Fibre also provides a future proof bandwidth upgrades due to the fact that you can multiplex wavelengths on fibre media. The cost of maintenance and operations is more restricted for running and operating access fibre networks, giving a considerable advantage for TCO network considerations.

Fibre in the access technology evolution
The requirements for fast time to market have enabled network architectures based on ethernet connectivity and switching. Ethernet transmission and switching have

become commodities for attractive entry costs and rapid innovation cycles.

Some ethernet architectures have been based on architectures where switches located in the basements of multi-dwelling units have been interconnected by Gigabit ethernet in a tree or ring structure. This has enabled sharing bandwidth over access rings of Gigabit capacity.

Also, ethernet star architectures have been able to provide dedicated fibre (typically single mode, single fibre with 100BX or 1000BX ethernet transmission) to every endpoint (POP), where they are terminated on a switch. These deployments are likely to evolve to 10Gbits access point to point architecture to deliver a 10Gbps pipe to business or commercials, a bandwidth that is likely to be shared within the customer end point by a home or local network to distribute among end points for sharing bandwidth

PON architectures for FTTH deployments are based on passive optical splitters to distribute the fibre to each customer using splitting ratios ranging up to 1:64 or even 1:128. The physical PON FTTH architecture typically supports the ethernet protocol. PON network feeds a variety of optical network terminations (ONTs) or optical network units (ONUs).

ONTs are usually dedicated to an individual end user. An ONU is typically located in a basement or even on a curbside and shared by a limited number of users. Voice, data and video services are distributed over appropriate transmission media within the customer premises from the ONU or ONT.

This is due to the fact that the first customer on a PON already requires an optical line termination (OLT) port and thus, the number of OLT ports cannot be reduced based on a lower take rate.

Point to point has direct migration through the upgrade of electronics at the central office from 100Mbps to 1Gbps and then eventually to 10Gbps as direct upgrade path that benefits subscriber over the same fibre pair. This is straight forward via the replacement or adjustment of electronic line speed attached to the fibre pair.

For PON, there is use of a wavelength-division multiplexing (WDM) overlay to implement the new PON technology on the same fibre plant, but on different wavelengths. As current PON receivers are not wavelength-selective, this requires wavelength filters to be inserted at all the endpoints before the migration begins. TDWDM allows for 4 wavelengths to be multiplexed on the same OSP to increase the capacity to 10Gbps per each wavelength on the GPON system.

Bandwidth evolution in FTTH is safe and considered one of the main advantages as it evolves and scales to needed demands of the future without any constraints, giving unlimited capacities.

No doubt here; fibre in the access is the future safe bet as an access media. TR

By Gamal Hegazi, T&T Committee Chair, FTTH Council MENA

Fibre growth creating specialized training needs

The installation of fibre optics has been growing very rapidly. Of course, the primary reason is the explosion of projects for fibre to the home (FTTH), but we're also seeing the same kind of growth in datacenters, DAS (distributed antenna systems for cellular) in large pubic facilities, fibre to the antenna (FTTA) on cell towers, municipal fibre networks supporting education, public safety, security and intelligent transportation systems, alternative energy projects and many more.

The need is also growing for more trained workers. We've seen high growth in the number of students at FOA schools worldwide getting trained and certified. We're also seeing more experienced workers coming to FOA applying for direct certification through our "Work To Cert" program. Often it is because their customers are requiring it - after having problems with installation projects caused by incompetent workers.

Based on this, our partnership with FTTH Council MENA helped to answer this need in the MENA region with the first FTTH certified training held in Beirut in 2012, and in other countries such as KSA, UAE, Jordan and Palestine till date. The FOA instructors are enjoying the trainings organized by the council, helping them meet with new trainees from different countries in each session.

These FOA-trained and certified workers are part of the success stories we hear almost daily about installation projects everywhere. It's obvious to FOA that training/certification and success go hand-in-hand.

> We've seen high growth in the number of students at FOA schools worldwide getting trained and certified

What's obvious to FOA is not obvious to everybody. Cutting costs, especially the cost of employee training, is seen as a way to save money and create more profit. Those making financial decisions do not understand that poor job and/or project performance caused by inadequate training will reflect badly on the company following that business strategy.

Here in the US, we have a saying for this: "Being penny-wise and pound-foolish."

Fibre optic equipment manufacturers and distributors can help

Fibre optic suppliers ought to be concerned also. Invariably, it seems, the contractor will blame the manufacturer of the products for the failures. FOA gets calls for legal advice on some of these failed projects that end up in court.

If you are selling products for a project, isn't it worth your effort to ensure the installers are competent? Wouldn't you rather ask some questions in the beginning rather than have to bring out the technical experts (and maybe lawyers) later to defend your reputation? In practically every case like that, everybody loses.

If you are a cable manufacturer, do you limit your warranty to the delivery of good product on the reel to the customer location and it's their problem after that?

If you make fusion splicers, can you prove that bad splices are not the result of the function of your machine?

Test equipment manufacturers: do you guarantee that if your tester says "Pass" when the operator pushes the "Auto Test" button, the cable plant indeed is meeting the specifications required?

Wouldn't it be easier if you stated your warranty would only cover your product if installed by a properly trained and certified installer?

Training techs is part of the solution

Twenty years ago, most manufacturers had programs for "certified installers" that they had trained themselves. It was in reaction to the variability of those programs that the Fibre U Conference instructors (who included several companies that offered manufacturer certifications) decided in 1995 to start the Fibre Optic Association.

The charter of the FOA then was "to promote professionalism in fibre optics through education, certification and standards." Still is.

In the last 21 years, FOA has worked to:
- Create standards for fibre techs (our "KSAs" - the knowledge, skills and abilities needed for successful fibre techs)
- Create industry certifications like our CFOT
- Create training curriculum to teach those KSAs
- Find competent schools
- Certify instructors to teach courses that will create workers prepared to enter the workforce and develop additional skills through OJT (on the job training.)

We also need to educate the managers

The managers at organizations who contract to have their network installed, their facilities managers, managers of contracting companies and field supervisors need training as well. Whoever manages the design and installation of a project needs to understand the process of fibre optic installation well enough to make the important decisions that determine the success of a project.

We need to educate them about what's involved in a fibre project, what competencies contractors and their installers need and how to judge the finished project. We need to teach them how to develop their employees' skills through training and OJT under proper supervision. Only when they understand what they are managing, these problems will start becoming less widespread.

What you can do, whether you are a contractor/installer, distributor or manufacturer, is to politely inform your customers that it takes skill and experience to successfully build a fibre optic network. That using trained and certified workers will help ensure the investment they are making in their network will have a proper payback. TR

By Jim Hayes, president, The Fibre Optic Association, Inc.

> We've seen high growth in the number of students at FOA schools worldwide getting trained and certified. We're also seeing more experienced workers coming to FOA applying for direct certification through our "Work To Cert" program

Fibre to the Home Council Middle East & North Africa

FTTH Enhancing Life

Join the FTTH community by becoming official member of FTTH Council MENA

For membership and information contact info@ftthcouncilmena.org

The FTTH Council MENA is a non-profit organization with a mission to accelerate FTTH adoption by all broadband stakeholders through information and promotion, and to accelerate the availability of fiber-based, ultra-high-speed access networks to consumers and businesses. Since its creation in 2011, almost 50 members from vendors, operators, consultants and content providers joined the FTTH community. The members of the board and the committees are all committed to spread the FTTH message and encourage the technology which delivers a flow of new services to enhance the quality of life, contribute to a better economic environment and boost competitiveness.

Stay Connected with FTTH Council MENA

www.ftthcouncilmena.org