

## SPECIAL FEATURE

## Broadband Telecommunication Stimulates Economic Growth – Optical Fibre is a Key Enabler

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It is well recognized that countries with higher broadband penetration typically have higher GDPs. Several studies worldwide have shown that an increase in broadband penetration can significantly increase the GDP: for India it has been predicted that a 10% increase in internet and broadband penetration would add \$17 billion or a 1.08% increase to the GDP. Not surprisingly, there is significant government support worldwide for broadband, including in India with the National Optical Fiber Network (NOFN). In order to reap the complete benefits that broadband can bring, most governments are targeting high speed broadband, with subscriber download speeds in excess of 10Mb/s.

In addition to GDP growth, high speed broadband can also bring socio-economic benefits. Agile e-education becomes possible, which can enable high quality education for all, especially those in remote locations. It also enables e-working which helps to break down economic barriers both nationally and internationally and drives down the overall cost of doing business. High speed broadband supports e-health, facilitating rapid transfer of health information to benefit the patient. Its most widely recognised social benefit is e-entertainment.

### Technology Choices

When it comes to broadband technology, there are a variety of high speed broadband options to choose from including the fixed/wire-line options of VDSL (Very high speed Digital Subscriber Line) and FTTH/B (Fibre To The Home/Building) and the wireless broadband option of 4G/LTE. VDSL uses optical fibre feeder cable to connect from the local exchange to a cabinet deep in the access network, from there the data is carried to/from the subscriber over traditional copper cables (telephone lines). To enable its high data rates, 4G/LTE

requires optical fibre feed to the local antenna and from there transmits data to the subscriber via wireless. FTTH/B provides a direct optical fibre connection from the local exchange to the subscriber's home or building.

It is interesting to note that all these high speed broadband technologies require a fibre feeder cable deep in the access network and so are all dependent on optical fibre including wireless broadband.

When determining which high speed broadband technology to use, it is of value to review the relative performance of these technologies in terms of broadband speed, ability to deliver symmetry, ability to deliver those speeds over at least 2km so as to reach suburban and rural communities, ease/speed of installation, effect of peak subscriber usage, scalability to higher speeds as applications and technology evolve, and power usage for lower OPEX as illustrated in Table 1.

Wireless technologies like 4G/LTE are relatively easy to deploy, but the data rate is very dependent on the distance to the antenna and number of active users per cell. On the other hand, complete optical fibre solutions require cable deployment in the last mile to the subscriber, but can offer a dedicated symmetrical 100Mb/s or more per subscriber even at distances of 20km from the local exchange.

Hence it is widely accepted that when it comes to capacity, symmetry and reach, the point to point (P2P) and GPON FTTH/B solutions are unsurpassed. That being said, wireless high speed broadband solutions offer mobility, which is something that fixed-line FTTH/B cannot offer. Consequently, next generation broadband access deployments will feature fixed-mobile convergence, where fixed/wire-line FTTH/B deployments will work in synergy with high speed

broadband wireless deployments (4G/LTE), with the wireless providing the subscriber with broadband mobility when required, and the fixed line FTTH/B providing the required broadband capacity both for the fixed-line broadband service, but also for the wireless broadband service by providing a path for early mobile data hand-off from wireless on to the fixed line network.

### Energy Considerations & Global Trends

Power usage is becoming a key consideration for high speed broadband technology adoption trends worldwide. When you compare the typical power usage per subscriber of each technology relative to the range of downstream speeds that they deliver, it is clear LTE/4G is advantaged amongst the wireless technologies. It is also evident that the P2P and GPON FTTH/B technologies have even low power consumption while enabling the highest broadband speeds. GPON, due to its split signal architecture, has the lowest power usage with typically less than 1W/subscriber including PUE. This fact has been validated by Verizon Communications Inc. in the United States, who released a statement citing that the power requirements of its FTTH GPON network are only 38% of the power requirements of its DSL network, resulting in a significant reduction in Verizon OPEX.

Looking at technology adoption trends globally, we find that VDSL is strong where good copper exists, for example Western Europe, and that P2P FTTH/B is favoured by new entrants and competitive carriers. Most recently a strong trend of GPON FTTH/B adoption by incumbent telcos has evolved, partially due to the attractions of lower energy usage, but also due to GPON unit costs coming down. Worldwide, LTE is being adopted as a mobile broadband solution and for some as a complementary technology to FTTH solutions.

### Broadband India

Since all high speed broadband solutions need optical fibre, and India is on a path to broadband for at least 90% of the population, it is useful to analyse India's optical fibre deployment relative to the number of potential broadband users.

India has almost one billion mobile subscribers, second only to China. With the advent of smartphones, India's mobile subscribers could get high speed wireless broadband, but this needs significant optical fibre cable support. The number of optical fibre km deployed per mobile subscriber in India is 0.1km while the figures for China, USA and Japan are 0.5km, 1.4km and 2km or 500%, 1400% and 2000% higher, respectively. Smartphone (wireless broadband device) penetration is also low in India at 3% of handsets versus a global average of 30%. So relatively speaking, India has very low optical fibre length per mobile subscriber, which correlates with a similarly low current broadband (fixed and wireless)

penetration rate of 1.7%. Thus, India will need to deploy more optical fibre to enable increased high speed wireless and wireline broadband penetration.

To promote wireless and wire-line broadband network deployment, studies of deployments around the world indicate that favourable regulation that supports private investment, nurtures competition and subscriber choice and eases rights of way can be a critical catalyst. Once broadband networks commence deployment, service providers should nurture their business by driving preference for high speed broadband via early marketing and subscriber education, and by securing high levels of subscriber

take-up via early development of e-money, e-education and e-health services and provision of attractive business and entertainment offerings: for the latter, tapping into India's rich source of movie and sports content.

High speed broadband has the ability to change a nation. The wireless and fixed-line technologies that enable this broadband are there and waiting, but only further deep deployment of the fundamental supporting technology – Optical Fibre Cabling, will enable any nation to reap the full economic and social benefits that high speed broadband can deliver.

## AMCHAM EVENTS

### Delhi

#### Luncheon Meeting with Ms. Mara Burr, Deputy Assistant U.S. Trade Representative

Select Amcham members attended a luncheon meeting with Ms. Mara Burr, Deputy Assistant U.S. Trade Representative, and Ms. Nicole E. Weber, First Secretary, Economic Affairs, and Ms. Annaliese J. Heiligenstein, Economic Officer, from the U.S. Embassy on June 1st at ACSA, New Delhi. Members discussed the pricing policy in pharma and issues relating to IPR, agriculture and healthcare.

#### Interactive Session with Mr. Nitin Gadkari, National President, Bharatiya Janata Party (BJP)

Amcham along with the Centre for Knowledge Sovereignty and the Centre for Digital Economy Policy Research organised an interactive session with Mr. Nitin Gadkari, National President,



Bharatiya Janata Party (BJP), on June 5th at Hotel Le Meridien, New Delhi. Members of Amcham made specific suggestions relating to their sectors. Some of the sectors covered were Aviation, Defense, Financial Services, Information and Communications Technology, Infrastructure, Energy, Homeland Security, Manufacturing, Healthcare, and Intellectual Property Rights.

Mr. Gadkari responded and requested members to send their detailed notes on the subjects so that he could discuss the same with the concerned persons in his party.

#### Meeting with Mr. Anup Wadhawan, Joint Secretary, Department of Commerce

Mr. Ajay Singha, Executive Director, along with Ms. Madhvi Kataria, Deputy Executive Director, met Mr. Anup Wadhawan, Joint Secretary, Department of Commerce, on June 5th in New Delhi. They invited Mr. Wadhawan for an interaction with Amcham members on market access issues. Mr. Wadhawan suggested that issues relating to India-U.S. trade and investment should be sent to him in advance so that he could obtain responses from the concerned Ministries / Departments.

