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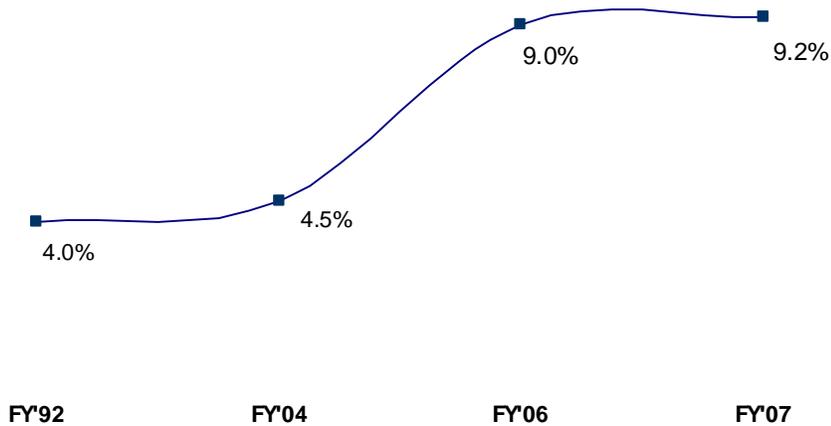
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## Section I - Indian Macroeconomic view

### *Growth advantage*

India is now recognized as a global powerhouse with a trillion dollar economy due to its rapid development over the last 15 years. It is currently the second fastest growing economy in the world with a net growth rate recorded at 9.2% by the end of Q2 of FY'07.

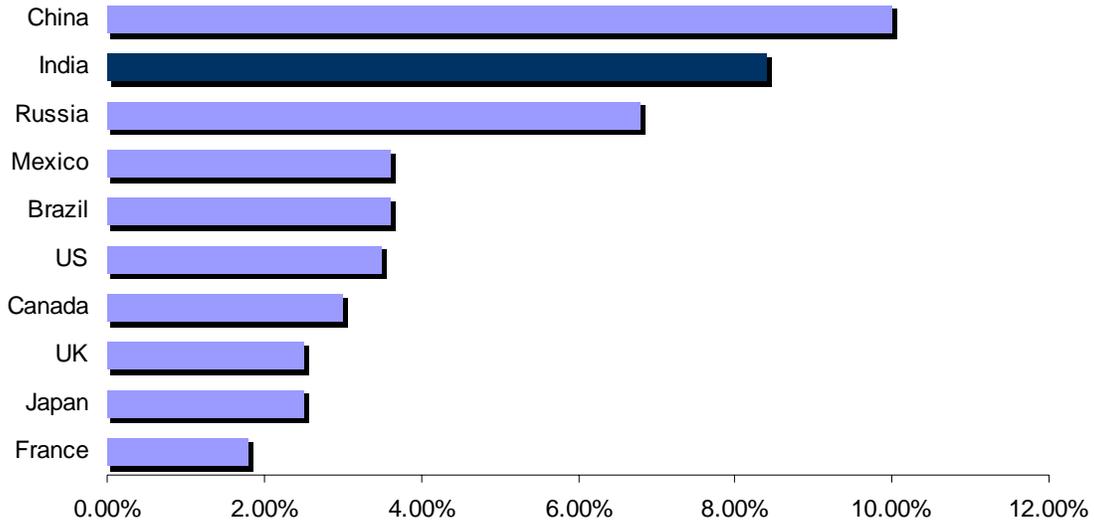
#### GDP Growth Rate



Source: Economic Survey, FY'07 and Prime Minister's economic advisory council's forecasts

Indian economy is ranked 10th in the world based on the US \$ exchange rates and is expected to add its next trillion dollars in the coming 5-6 years. Service sector has been at the forefront of the economic growth accounting for nearly 70% of average growth in the last 5 years.

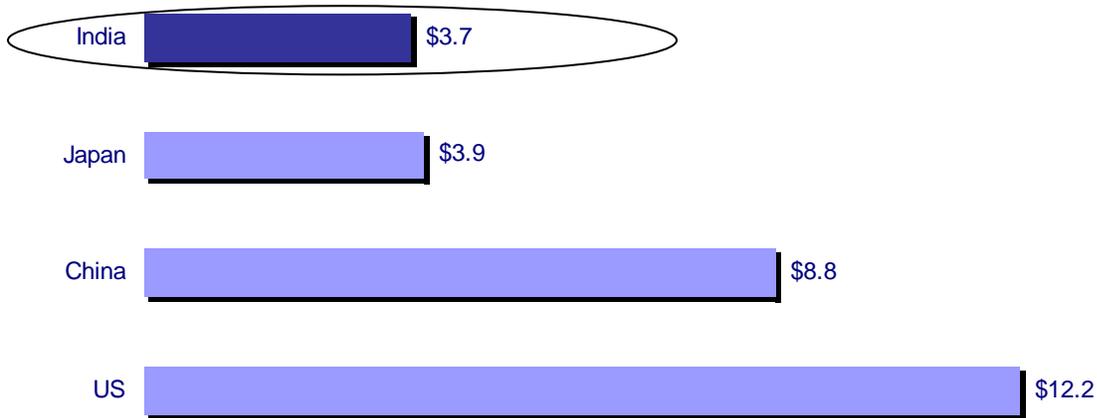
#### GDP Growth Rate – A comparative (2003-2006)



Source: World Development Indicators 2007

In terms of purchasing power parity (PPP), India is currently the 4th largest economy in the world and is slated to surpass Japan and become 3rd largest by the end of FY'08.

**GDP (PPP Terms, FY'07)**



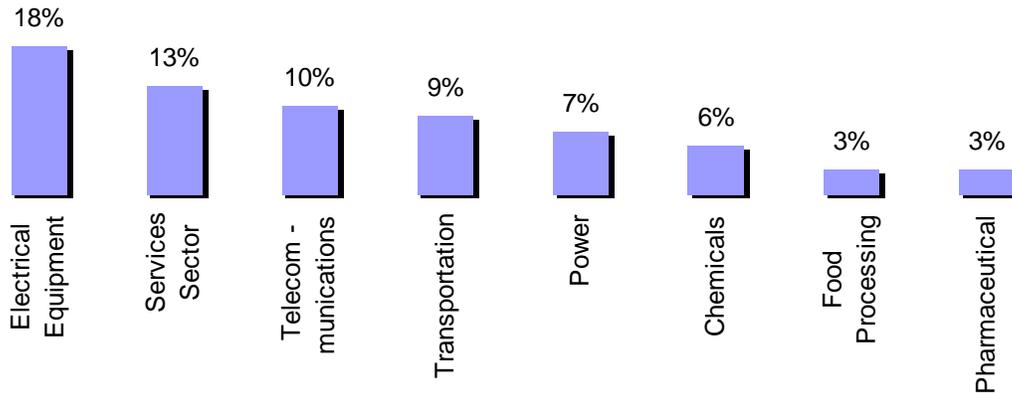
Source: World Development Indicators 2006

**Foreign direct Investment (FDI) inflows**

Positive factors like educated workforce, favorable regulatory environment and encouraging policy initiatives have created an attractive environment for the investors. The FDI inflow in India has witnessed robust growth and India has surpassed South Korea to become the 4th largest recipient of FDI in Asia Pacific region. During financial

year ended 2007, FDI inflows were about US\$16 billion. More than 50% of the FDI inflows over the last 15 years have been towards the services sector which has been the growth engine of the Indian economy.

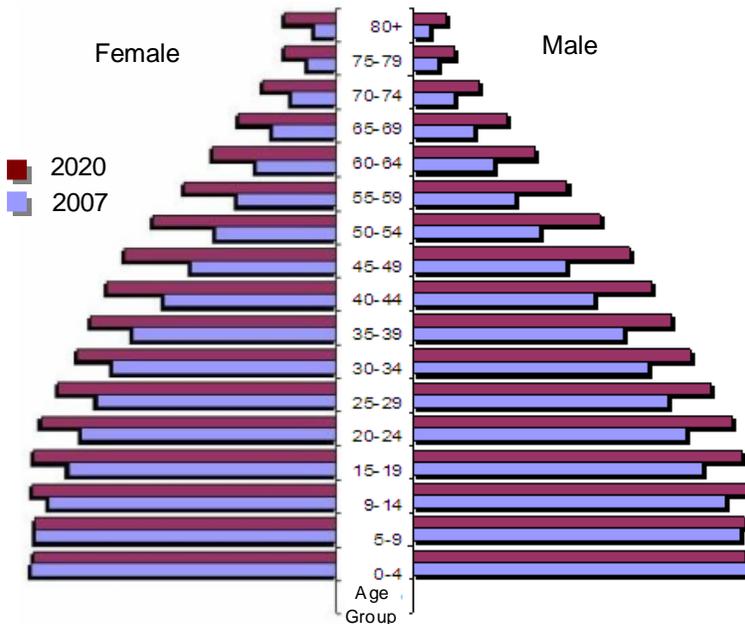
**Sector wise FDI Inflow ( Aug'91 – Sept'06)**



Source: Economic Survey FY2007

**Demographic advantage**

Population projections from the Planning commission of India indicate that from a current 59% share of working age population (15-64) years to total population this share will peak to about 65% translating nearly 900 million by year 2020.

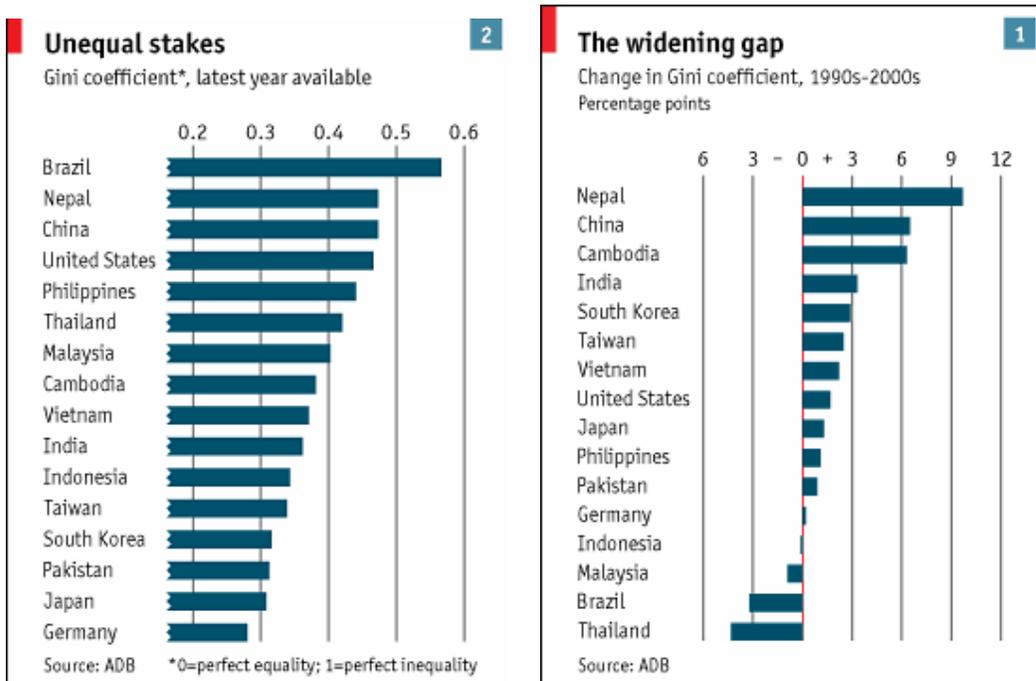


Source: U.S. Census Bureau, International Data Base.

**Key Demographic Facts**

- Working age population to peak to nearly 900 million in 2020.
- Size of Indian middle class is estimated to swell from current base of 54 million to more than 540 million in the next two decades
- India has the second-fastest growing HNI (High Net worth Individuals) population in both the APAC region and the world

According to a report by the Asian Development Bank (ADB), income inequality has increased over the past decade or so in 15 of the 21 countries it has studied which included India. Income inequality is usually measured by a country's Gini coefficient, in which 0 is perfect equality (everyone has the same income) and 1 is perfect inequality (ie, one household takes everything).



Source: *The Economist*, August 2007

According to *The Economist*, India's Gini coefficient is in the lower half of the Gini coefficient chart, yet health and education measures suggest that India suffers from wide disparities. In the richest 20% of households, only 5% of children are severely underweight, compared with 28% in the poorest 20%—a wider gap than in countries which have higher Gini coefficients. In India's richest state 99.8% of the population has access to clean water, but only 2% does in the poorest. The comparable figures for China, where income inequality is officially much greater, are 100% and 75%. The main cause of increased inequality is the differing fortunes of rural and urban households. Productivity—and hence income—is growing much more slowly in agriculture, on which most of the poor depend, than in manufacturing or services. A second factor is the widening gap between those with and without skills.

These disparities whether it be improved productivity and/or access to skill upgradation can to a great extent be alleviated by provision of cheap and easy access to education, health and employment opportunities to the poor households in both rural and urban India. Telecom services through broadband based e-education, e-health and e-employment services can help bridge this inequality and therein lies the untapped opportunity in this sector.

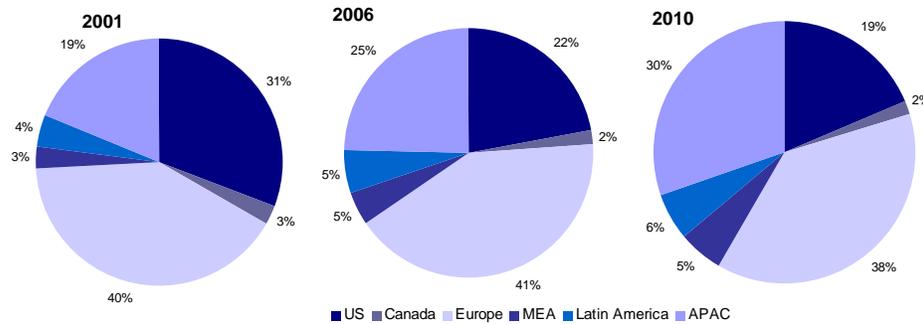
## Section II - Global Telecom Industry

By 2007 end, the global telecommunications service industry revenue is estimated to double itself over its 2000 base.

### Changing world order

Currently, the developed markets primarily consisting of the US, Canada and European markets contribute nearly 65% of the global telecom service revenues market share. However, the growth of telecom services in the APAC (Asia-Pacific) region is resulting in their increasing contribution to the global revenues. For the period, 2001-2006, the APAC region contribution has increased about 1% per annum, and this trend is expected to continue till 2010. In addition to APAC region, Middle East and Africa is also expected to grow significantly due to increasing demand arising out their under developed telecom infrastructure.

Global Telecom Services Revenues – Geographical Breakup



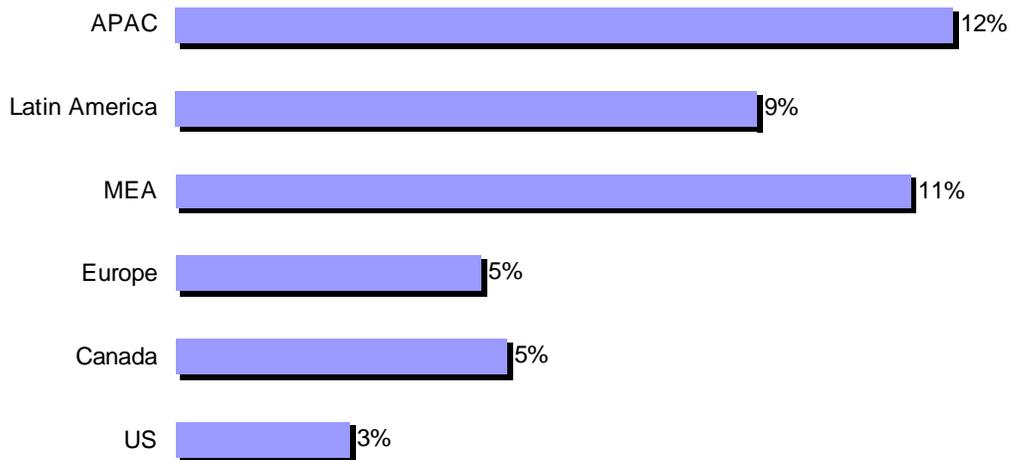
**The high saturation levels in developed markets has brought the APAC region led by growth in India and China in focus**

Source: Telecommunications Industry Association (TIA) Study, PwC Analysis

### APAC – highest growth region

The APAC region is set to lead the global telecom services revenues growth till 2010 on account of low penetration levels in the region resulting in continued growth in the mobile segment, expanding broadband market and increasing usage of entertainment and other non-mobile applications. Increased spending on expanding network reach and on services in support of enterprise will also contribute to the growth of the service revenues in the region.

**CAGR (2006 – 2010)**

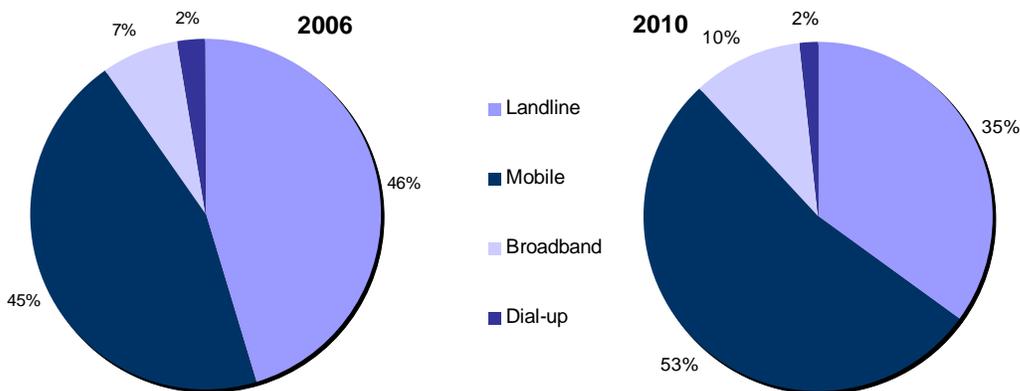


Source: Telecommunications Industry Association (TIA) Study, PwC Analysis

***Growth led by mobile segment***

Mobile services have been the catalyst for growth in the global telecom service industry and its share to total revenues has increased from 23% to 45% during the period 2001-2006. Globally, mobile subscriber base surpassed wireline subscriber base in 2002 and it is estimated that by 2007 end there will be more than twice as many mobile subscribers as wireline subscribers. The mobile segment revenues are also expected to surpass the wireline segment revenues by this year end.

**Global Telecom Service Revenues – Segment wise breakup**



***The gap between the subscriber base of wireless and wire-line services is widening continuously***

Source: Telecommunications Industry Association (TIA) Study, PwC Analysis

The decline in the wireline segment with increased uptake of mobile segment is a combination of factors such as reduced prices for mobile rollouts, demand from APAC and other developing countries with poor support infrastructure for wireline rollouts and increased desire for personal connectivity. In the coming five years the growth will

continue to emanate from mobile services demand in the developing and underdeveloped markets. Demand for broadband services is expected to increase significantly due to anticipated rollout of triple play services while the narrowband dial-up market is estimated to decline further.

Accordingly it is expected that over the next 4 years the mobile segment will continue to grow at annual rate of about 12%. The landline market is expected to remain almost stagnant till 2010, with an annualized growth of about 2%.

## Section III - Indian Telecom Sector: An Overview

### Overall performance

India's telecom market has grown rapidly in the last few years and with revenues of over US \$ 22 Billion and an annual growth of about 25% it is now the 3rd largest telecom market in the world.

The mass market growth in India is led by the mobile segment which has helped expand the size of the addressable market by increasing affordability due to sustained reduction in prices over the last decade. As a result, mobile sector is now adding an impressive 8 million plus subscribers monthly.

Key Indicators	Status	Comments
FDI <sup>1</sup>	~ US\$ 4 Billion	3rd largest across sectors
Access Subscriber Base <sup>2</sup>	+ 240 Million	FY'10 Forecast: 528 Million
Cellular Monthly additions <sup>2</sup>	+ 8 Million	Highest in world
Tele-density <sup>2</sup>	+ 21 %	FY'10 Forecast: 42%

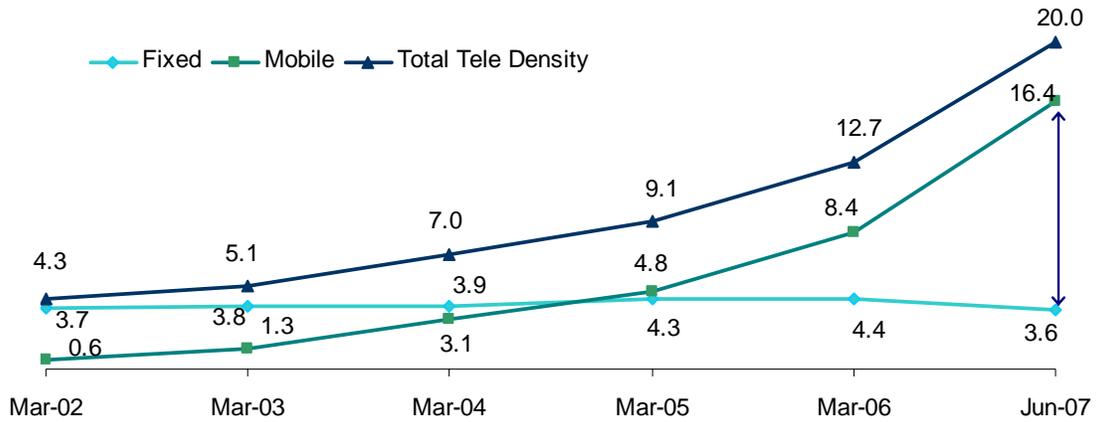
Source: 1- Economic Survey FY'07, 2 – TRAI (August 2007)

### Growth of access telephony services led by mobile

The boom in the Telecom sector in India is led by the mobile segment. Consequently, the gap between mobile and wireline teledensity has been widening sharply since the last 5-6 years due to tremendous growth in mobile subscriber additions in contrast due to the churn experienced by wireline segment. As a result, mobile teledensity in India is now more than 4 times the fixed-line teledensity.

As a fallout of the above customer preference of mobile services over wireline, the revenues of the mobile and fixed line service segments have also been following opposite trends . While, mobile segment revenues have been increasing at over 50% annually in last couple of years, fixed line service revenues have witnessed a down turn.

#### Contribution of Fixed teledensity and Mobile teledensity to Total teledensity



Source: TRAI reports

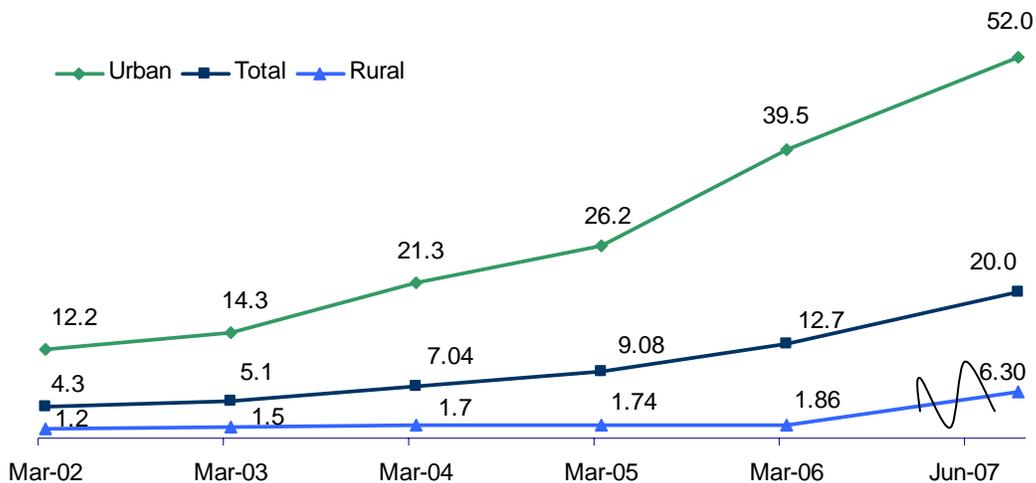
**Mobile services have become the preferred mode of entry for new subscribers.**  
**Wireline subscribers are switching over to mobile segment.**

- Key reasons for declining share of Fixed line access in total access lines**
- Comparable tariffs of mobile access and fixed access
  - Increased affordability due to falling prices of mobile handsets
  - Mobile access provides mobility over and above voice connectivity that fixed access provides.
  - Lower waiting time for getting a mobile connection

## Widening Urban-Rural<sup>1</sup> Divide

In the past decade, India has made significant strides in increasing its telecommunication access with manifold increase in its overall teledensity. However there is a large urban–rural divide in terms of deployment of lines vis-à-vis population that is getting serviced through the available telecom services. The approximately 70% of the Indian population living in rural areas is served by only 22% of the total access lines in the country.

Contribution of Urban teledensity and fixed teledensity to Total teledensity



Source: TRAI reports, PwC Analysis

~ Rural mobile subscribers (33 Million) were reported for the first time in TRAI Report on Quarterly Performance Indicators, January – March, 2007

<sup>1</sup> The urban and rural India is classified based on the Census of India definition. The census classifies urban areas as:

- Statutory towns: "All the places with local authorities like Municipal Corporations, Municipalities, Cantonments and Notified town areas"
- Non-Municipal towns or Census towns :All places which are not statutory towns and satisfy **all** the following criteria:
  - a minimum population of at least 5,000 AND
  - at least 75 per cent male working population in engaged in non-agricultural and allied pursuits AND
  - a population density of at least 400 per square kilometer".

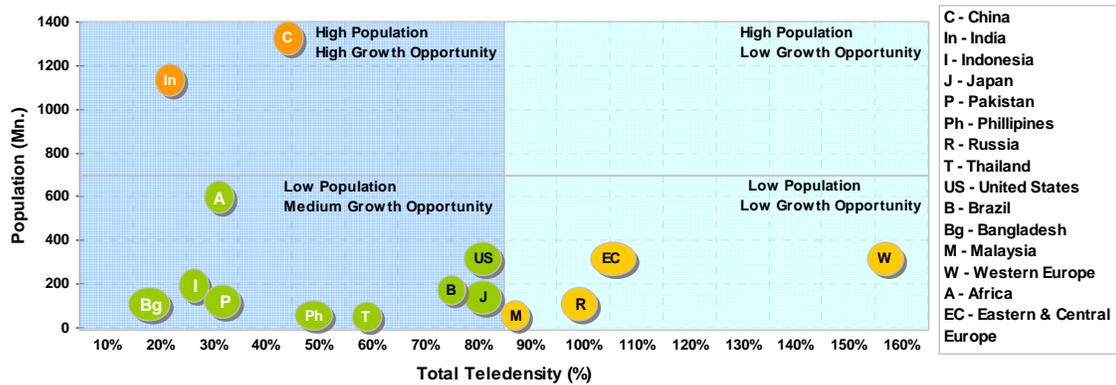
Rural India, by definition, comprises all areas that are not urban by the above census definition.

The gap between the urban and rural teledensities has been widening with urban teledensity currently at more than 50 and rural teledensity at less than 7 access lines per 100 rural population . In urban areas, Metros are estimated to have mobile teledensity of about 70 compared to rest of urban India at less than 40% mobile teledensity. In rural India, majority of the total teledensity of 7 is contributed by mobile services to 37 million rural subscribers resulting in about 5% rural mobile teledensity, balance being contributed by fixed line services.

**Comparison with International markets**

The teledensity of India at about 20 coupled with its billion plus population offers immense growth potential for the telecom services sector in the coming years when compared with growth expectations from most developed markets with teledensities of over 70-80. The attraction of the Indian growth potential seems higher when it is compared even with its Asian neighbours such as Indonesia, Thailand, Philippines etc, that have higher teledensities but much smaller population base.

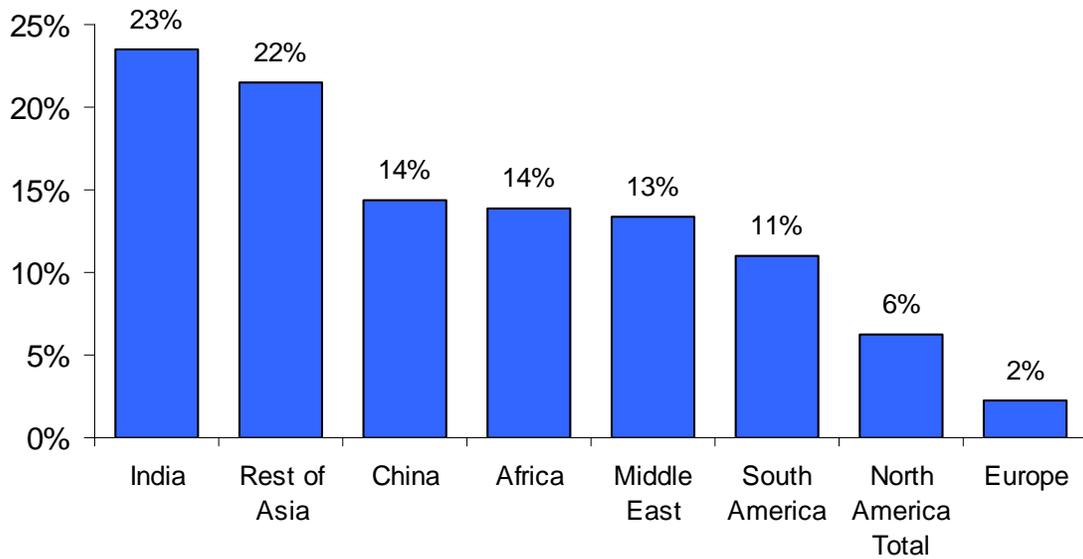
**Population vs Tele-density**



Source: Telecommunications Industry Association (TIA) Study, PwC Analysis

In terms of future growth estimates, European and North American markets are saturating other international markets are still experiencing significant growth and are led by the highest growth projections for the Indian market.

**Projected growth in regional mobile subscribers 2007-10 (CAGR %)**

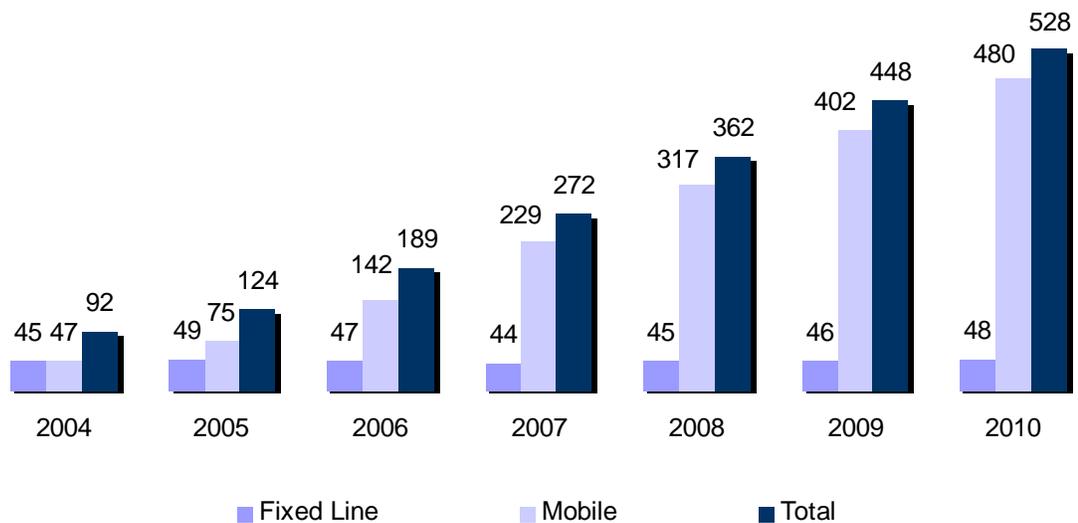


Source: Telecommunications Industry Association (TIA) Study, PwC Analysis

### **Growth Projections**

It is estimated that the total access line subscriber base in India would continue its strong growth pattern to reach over 500 million by 2010. This growth will continue to be contributed by the mobile services segment which would be the preferred rollout medium even for rural markets which are expected to contribute to the majority of the next phase of growth in the country.

#### **Access Subscriber Base Forecasts**



Source: PwC Analysis

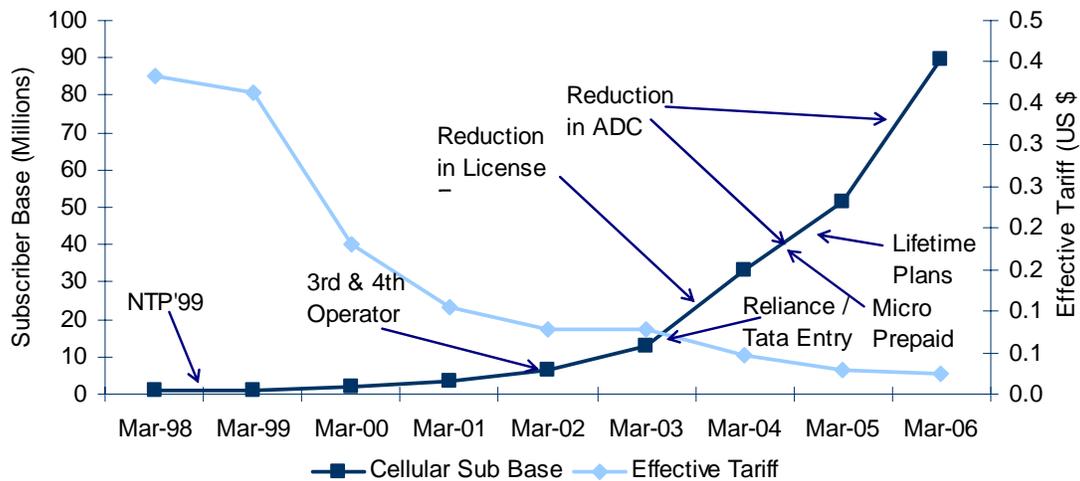


## Section IV – India Telecom Sector: Key Highlights

### ***Impact of market, policy and regulatory interventions on mobile pricing***

Since liberalization, the timely interventions carried out by the policy and regulatory institutions of Government of India coupled with the operators initiative has resulted in steep fall in tariffs with current airtimes rates of between 2-3 cents per minute, amongst the lowest in the world. The chart shows the impact of interventions: National Telecom Policy 99(NTP 99), Introduction of newer cellular licensees, introduction of Calling Party Pays (CPP) regime, reduction of Access Deficit Charges (ADC), introduction of innovative tariffs schemes by Operators on the cellular tariffs which have fallen by an unprecedented 90% in the last seven years and have been the driver for the mobile boom in the country.

**Impact of Market and Regulatory Interventions on Mobile Pricing**



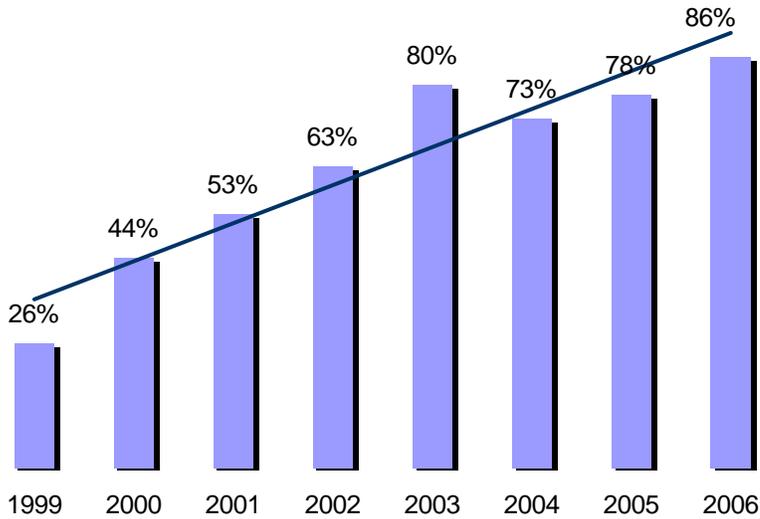
Source: TRAI, PwC Analysis

### ***Pre-paid as the dominant platform***

The Indian mobile sector continues to be predominantly prepaid, with more than 80% of the subscribers on the prepaid platform and almost 90% of incremental additions on this platform. This is also an indicator of the increasing addition of marginal subscribers on the network as the network expands to increase its reach.

Pre-paid penetration in Circles is higher than metros. Circle 'B', which has the highest subscriber growth rate, also has the highest adoption rate for pre-paid platform.

**Pre-Paid subscriber base as % of GSM mobile subscriber base**

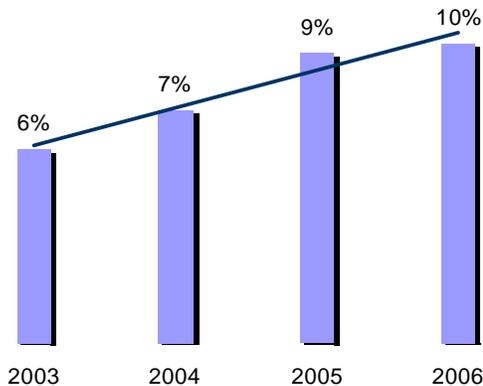


Source: COAI -PwC GSM Benchmarking Study 2006

**Value Added Services (VAS) growing in strength**

The Indian mobile phone market is transforming from a voice-only market to a platform offering varied value added services. This segment in India though still dominated by peer-to-peer SMS has seen increasing acceptance by subscribers for other personalized services such as ringtones, ringback tones etc. . Indian mobile VAS market is growing at a rapid pace and has been contributing to an increasing share in mobile operator revenues.

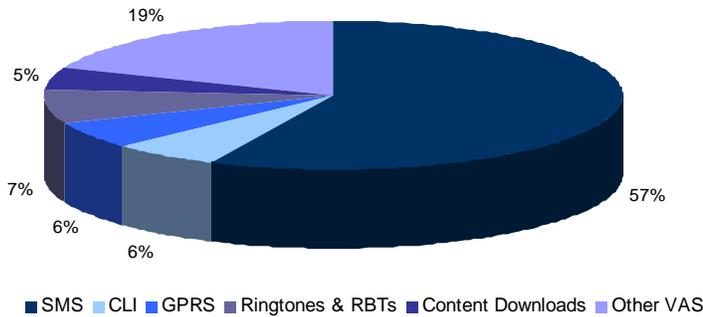
**VAS Revenue as a % of Gross Service Revenue**



Source: COAI-PwC GSM Benchmarking Study 2006

SMS still remains the most popular service and has seen a surge in its revenues over the years. This surge can be attributed to new subscribers adopting SMS as the first VAS service.

**VAS Revenue Breakup (2006)**



Source: COAI-PwC GSM Benchmarking Study 2006

In the near to medium term, VAS surge will continue to be led by ringtones, ringback tones, voice-based & text-based services with games emerging as a strong niche. In terms of nature of services, pure entertainment service would continue to appeal to the youth but there would be shift towards utility based services led by mobile based financial transactions and location based services

In order to reach these wide gamuts of services to the end customer, a mobile VAS ecosystem is taking shape. It consists of content providers, aggregators and mobile operators along with the application service provider's (ASPs). The ASPs provide the technology platform and make the integration of mobile networks and content servers possible. The value chain is consistent across the delivery platforms i.e. SMS (text), voice and GPRS.

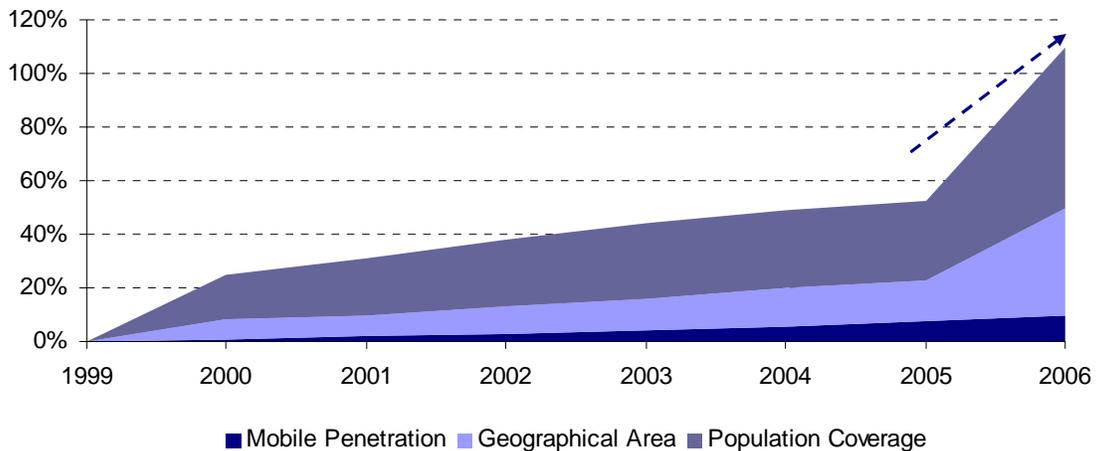
VAS growth has been fuelled by increasing quality of handsets, lowering age profile of handset owners and innovative content and packaging. Increasing number of handsets are now enabled with colour screens, polyphonic tones and GPRS and provide greater opportunities for offering innovative VAS services. Mobile penetration in India is still comparatively low and there is further scope of accelerated pick up in the coming years. India has one of the youngest average ages of population, considered more amenable to such services, providing impetus to adoption of new services. As mobile penetration and VAS volumes increase, VAS related tariffs are expected to come down, further fuelling uptake of these services.

A concerted effort by all stakeholders of the mobile Vas ecosystem towards addressing issues to such as revenue sharing between Operators and content developers, ensuring copyright protection and focused development of innovative products for specific target segments will ensure sustained growth in this segment.

## ***Shifting focus of telecom coverage from urban to rural***

Currently, of the total fixed lines in India, about 70% of these lines cater to urban areas and only 30% of these lines service the rural areas. In mobile services, an even higher share of 80% of the total mobile lines are servicing urban areas and only 20% are catering to rural subscribers. In terms of coverage it is estimated that mobile signals have reached an estimated 40% of the geographical area and about 65% of the overall population of India.

### **Telecom Spread**

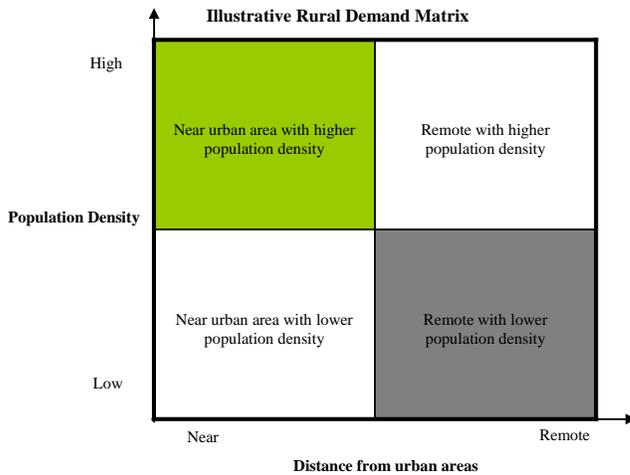


Source: GSMA

It is estimated that the rural population coverage is largely due to signal overflow from urban areas to adjoining rural areas and attempts are being made by Operators to achieve presence in rural markets so as to sustain their growth momentum and overcome the increasing saturation in the maturing urban markets like Metros and towns.

***Saturation in urban markets and the need to sustain growth is providing the impetus for India's mobile operators to reach out to fulfill rural demand, a virtually untapped market***

Over the last few years, the major thrust area for telecom service providers has been urban areas as it offered higher population density with higher spending power, relatively easier rollout and comparatively better support infrastructure. In contrast, rural rollout is slowed down by issues pertaining to higher per subscriber entry and operational costs and lower ARPU expectations.



Source: PwC Study on “Assessment of Issues and Strategy for Accelerated Telecommunications Connectivity” - A Study on Rural Telecommunications Development in India for The World Bank

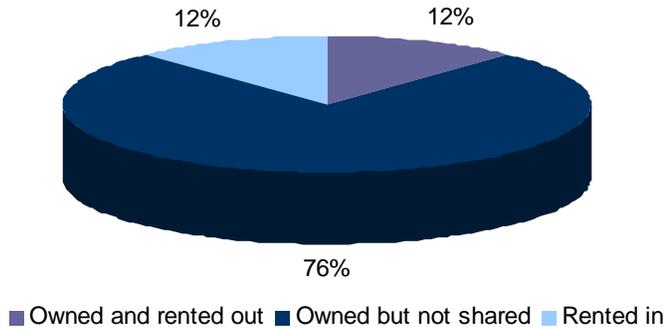
In the illustrative demand matrix above, the area marked in ‘Green’ due to its proximity to urban areas and higher population density is expected to have lower cost of provision and higher demand for telecom connectivity respectively and conversely the area marked as ‘Grey’ is expected to have relatively higher cost of provision and lower demand. Since rural rollout are relatively less documented, it is estimated that the current rural mobile subscriber base is contributed by the area marked in Green. The areas marked in white will be the next areas to be targeted by the mobile providers whereas as the “Grey” areas would be the ones demanding maximum policy and regulatory intervention for mobile coverage

### ***Tower sharing as means to affordable access***

Sharing of towers, which are essential building blocks for any mobile network, is becoming a necessity in the Indian context. With seven operators, increasing rural rollout and declining margins per minute, Operators are constantly on the lookout to cut costs in order to maintain and improve their margins. For the smaller players, shared tower infrastructure is also a way to catch up faster with their more established peers in terms of coverage. Once 2-3 operators start sharing and lower their costs, the rest of the industry cannot stay away for too long, thus making it a virtuous cycle. In a marked departure from its earlier stance, it has been reported recently that now BSNL wants to follow the industry trend of sharing infrastructure. It wants to utilise passive telecom structures like towers, space and associated power from infrastructure companies and telecom service providers on shared basis along with all related operations and maintenance activities in various locations of its different telecom circles.

Currently, out of the 1,20,000 towers in India, private mobile operators are sharing about 24% of their passive infrastructure on a twin sharing basis with operators in their respective service areas.

**Cell Site Sharing (2006)**



Source: COAI-PwC GSM Benchmarking Study 2006

An emerging trend in this area has been the increasing acceptance of the independent infrastructure (tower) providers. Consequently, from being viewed as a support infrastructure for mobile companies, mobile tower is emerging as a business with legitimate and lucrative business model on its own and with expectations of high-quality annuity revenues and cash flows.

**Drivers for growth**

- Need to sustain expected subscriber growth
- High network expansion costs in rural areas
- Anticipated launch of 3G / WiMax based services
- Rising site rentals
- Numerous governmental required clearances for cellsites .

**Benefits**

- Significant capital expenditure reduction due to site sharing
- Faster roll out of service
- Additional revenue stream due to site rentals and reduced operating expenses on shared sites

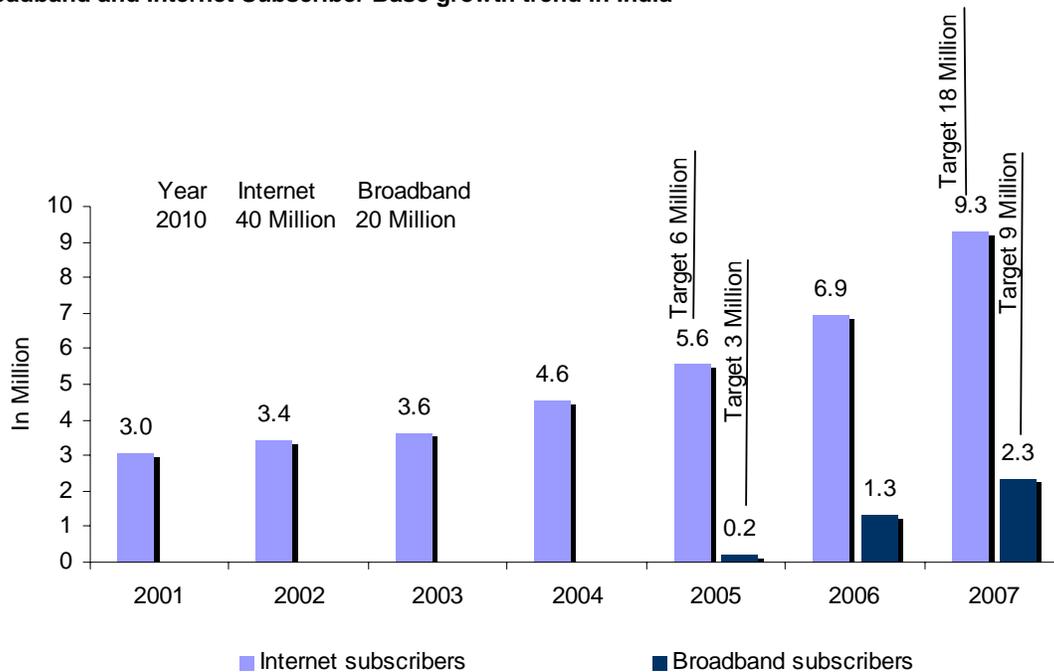
The industry projects a need for 350,000 towers to cater to about 480 million mobile subscribers by 2010.

Taking cognizance of the criticality of the tower infrastructure for mobile rollout in rural areas, DoT under the aegis of the Universal Services Fund (USF) extended its usage to include passive infrastructure and has concluded a tender for setting up about 8,000 towers in rural India with support from USF.

## Need for Broadband services

Year 2007 has been declared as the Year of Broadband with a target of 9 million broadband subscribers by year end. India currently has less than 2.5 million broadband connections and is well short of its year end target and till now has not been able to replicate the success of its mobile market model for achievement of its broadband targets.

### Broadband and Internet Subscriber Base growth trend in India



Source: TRAI, PwC Analysis

India with its powerhouse IT and IT enabled industries exhibiting consistent growth and enjoying international brand equity was expected to be a natural leader in Broadband uptake and usage in the early 2000s when the expected pecking order of countries was being drawn for potential success of these services. This however did not happen as we are witness to India repeatedly falling very short of its broadband targets year on year and has one of the lowest broadband penetration numbers in the Asia Pacific region

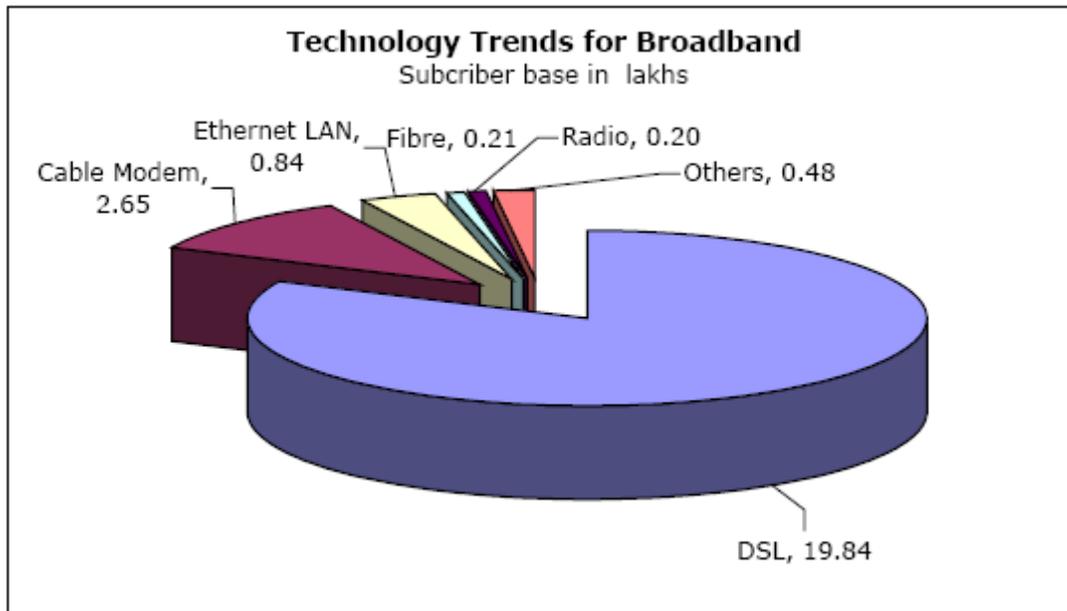
Broadband Subscribers in Asia/Pacific (Millions)	
Country	2006
South Korea	29%
Hong Kong	22%
Japan	19%
Taiwan	18%
Australia	15%

Singapore	11%
Malaysia	5%
New Zealand	5%
China	4%
Thailand	1%
India	0.2%
Philippines	0.2%
Indonesia	0.1%
Pakistan	0.06%

Source: Telecommunications Industry Association (TIA) Study

Broadband services per Broadband Policy announced in 2004 are defined as 'Always-On' data connection that is able to support various interactive services including Internet access and having the capacity of a minimum download speed of 256 Kbps to an individual subscriber from the point of presence of the service provider. In India these services were launched in 2005 and are essentially dominated by DSL connectivity over copper based fixed lines. The other broadband access mediums like cable, wireless etc. used internationally have very low relative penetration in India.

**Technology trends for Broadband in India – To be represented in % Terms !!**



Source: TRAI

There is an emerging consensus in the Industry that the key essentials for broadband services to take off are: Connectivity, End user Device (mostly PCs) and relevant local content. These are the building blocks for a "broadband" enabled system. Currently India is lagging in both easy and cost effective availability of all the three building blocks resulting in low broadband penetration.

Adoption of Broadband services on a mass scale is important for India as Broadband services can reduce the disadvantages of remote locations and low physical service availability in the country. It is very relevant for India with 70% of its population living in the rural areas which are characterized by their remoteness and poor infrastructure availability. A variety of applications are expected to take advantage of the comprehensive communication capability of broadband to provide a wide range of services including:

- Telemedicine
- Teleworking
- E-Government
- Agriculture
- Distance education / learning
- Public safety
- National security
- Applications for people with difficulty
- Small business assistance
- Information gathering
- Tourism
- E-commerce and Entertainment.

In addition to the above, in the knowledge economy of the 21st Century, for which India has positioned itself with investments and capabilities in IT/ ITES –BPO, Biotech and R&D, the knowledge “worker” would need to be connected both to share knowledge and conduct work across geographies and national boundaries, which can be very efficiently facilitated by broadband services. However, the drivers for Broadband services for the various stakeholders viz. Government, Service provider and Customer vary according to their needs.

<b>Drivers for Government of India</b>	<b>Drivers for Broadband Customer</b>	<b>Drivers for Broadband Service provider</b>
<ul style="list-style-type: none"> <li>▪ Sustain India's economic development</li> <li>▪ Respond to market demand</li> <li>▪ Bridge digital divide (98% of total population)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Get efficient access to relevant content and applications</li> <li>▪ Limited budget for spend on broadband services</li> <li>▪ Ease of use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Optimise business case</li> <li>▪ Extend the reach</li> <li>▪ Provide value added content</li> </ul>

The key issues related to Broadband are:

1. Price of Customer Price Equipment (CPE) and Service
2. Last Mile Access to the customer
  - Lack of access to the incumbent's copper loop for DSL by competitors
  - Low quality of cable TV infrastructure and lack of industry organization
  - High costs for DTH and VSAT access
  - Bottlenecks preventing wireless solutions from spreading
  - Cumbersome processes for Right Of Way (ROW)
3. Cost of connectivity
  - Lack of effective competition in the “within city”/ last mile access networks
  - High costs of international bandwidth

- Ineffective implementation of National Internet Exchange of India (NIXI)
- 4. Fiscal policies
  - High taxes and duties, and lack of fiscal incentives for faster growth
- 5. Content and applications
  - Lack of locally relevant content and absence of “change agent” to drive growth

*Source: Presentation by TRAI on Roadblocks for Broadband, 2006*

## ***Emerging Enterprise market segment***

Years 2006 and 2007 in India will be remembered for the interest shown by a wide array of both domestic and international operators vying for the revamped national and international long distance licenses. A majority of these are intended for tapping the growing Enterprise market for both voice and data connectivity. Most of the large Indian Telcos and global players such as AT&T, British Telecom, Verizon, Cable & Wireless, Equant, Singtel, Telstra etc. have set up or are in the process of setting up operations to cater to the communication requirements of their target customers. Till now majority of the international operators had been operating in India with an ISP license with partnership arrangements with Indian domestic operators to service their multinational customers in India. However, the revised international and national long distance licenses coupled with the growth in the Indian economy has provided the impetus for their increased presence in India. Domestic telcos such as Bharti, Reliance, Tatas etc. are also revamping their respective businesses units to provide targeted services to this growing segment. Operators such as Sify and Tulip-IT are also providing services in this space.

Voice over IP (VoIP) is considered one of key applications that enterprises in India are reviewing to deploy as a means to lower their operating costs. It has provided impetus for increased demand for IP based virtual private networks (IP-VPN) services in India. However the regulatory restrictions related to interconnection of data and public switched voice networks is an impediment in realizing the full potential of these services in enterprises. The other key services relevant for this segment are international private leased circuits, internet connectivity, MPLS based IP-VPN services and national voice and data connectivity. Majority of the Operators in this space are also in the process of extending their offering to include non-Telco value added services such as network security services, network integration services, network management services, network storage services, enterprise voice solutions etc..

The Indian enterprise market ( for both Telco and non-Telco services) was estimated at about US\$ 2.4 Billion in FY'06 and expected to grow at about 25% annually to touch about US\$ 6 Billion by FY'10. Growth in this segment is primarily being led by the demand for connectivity from the IT, ITeS, Government and the financial service segments.

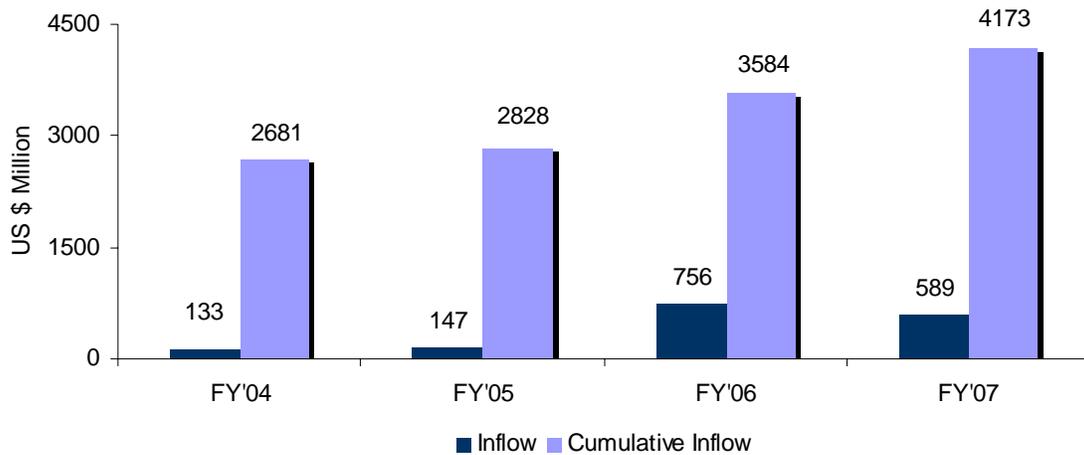
### Key Emerging Trends

- Relaxation in license and investment norms have attracted global telco's to setup in country presence to serve their target customers in India.
- Domestic operators are also focusing on this growing segment.
- Increasing demand for international private leased circuits, internet connectivity, MPLS based IP-VPN services , managed services, business continuity, data center and security solutions.

### Increasing investment inflow in Indian Telecom Sector

The strong growth expectations in the Indian telecom sector compared to near matured markets in developed countries is attracting foreign direct investments as well as institutional investments including significant private equity (PE) inflow in the country.

#### FDI Inflow in Telecom Sector



Source: TRAI Reports

Cumulative FDI inflow has reached over USD 4 billion dollars in the sector and majority of which has been targeted toward mobile sector. It is estimated that in 2006, PE funds flow directed at the Telecom sector was more than USD 3 billion and accounted for over 40% of all private equity deals in India. The attention on the Indian telecom sector from private equity firms is due reasons such as surge in consumer demand, rapid growth in the services sector, existence of laid out laws and financial systems and a booming stock market which provides easy exit opportunities.

### **Recent prominent deals in India**

- UK based GLG Partners picked up 8% stake in Idea cellular for USD 213 million
- ChrysCapital invested USD116 million for 5% stake in Idea Cellular
- Providence Equity Partners invested USD 400 million for 16% stake in Idea
- Temasek Holdings and Sterling Infotech invested USD 397 million in Tata Teleservices
- Aureos Capital announced an USD 8-10 million investment in Ordyn Technologies
- Sequoia Capital has investments in Mauj (USD 10 million), Bharti Telesoft (USD12 million), Nazara (USD 2 million) and Bubbly Motion (USD10 million)
- Lehman Brothers recently invested about US \$ 15 million in Cellebrum
- Northwest Venture Partners and Nexus have invested about USD 12-15 million in Mobile2Win.com

*Source: The Smart Cube*

The Indian Telecom infrastructure segment specifically the tower business is attracting special attention from PE funds. This can be alluded to the fact that Operators like Reliance Communications, Tata Teleservices, Bharti Airtel and Idea Cellular have announced their intentions to partly divest interest in their tower business, that is expected to grow significantly with the anticipated large rollouts planned for the Indian operations.

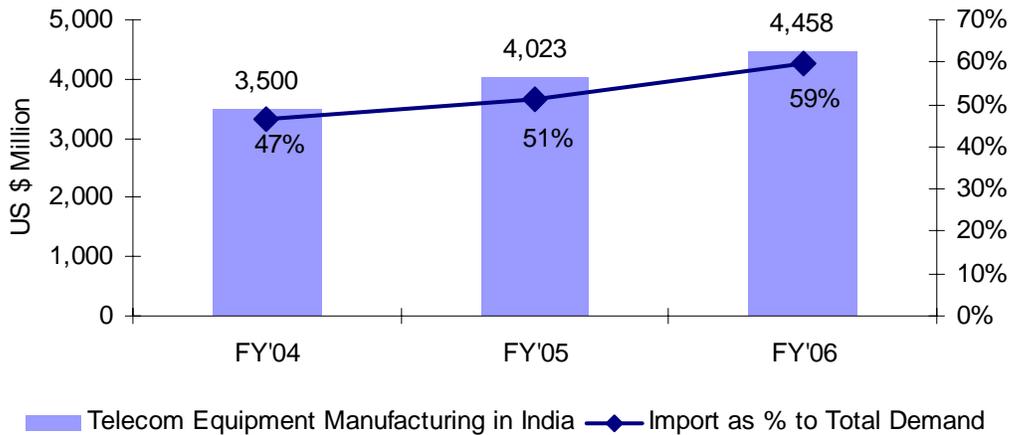
Investments are also flowing in areas related to Value Added services(VAS) content aggregation and new telecom technology companies. The attractive return on investments is resulting in focus on funding for initial capital to acquiring minority stakes and even control from start-ups to mid size and mature listed companies.

## Section V – Telecom Manufacturing Sector in India

### Current scenario

The Telecom manufacturing sector in India is estimated to be US\$ 4.5 billion and has grown at a average growth rate of less than 8% in last 10 years inspite of spectacular growth in the Telecom services market. Consequently share of import in fulfilling Indian telecom equipment demand has gone up from 47% in FY 2004 to 59% in FY 2006. The reason for increasing dependence on imports is the increase in demand from segments such as wireless, transmission and broadband where India currently has negligible manufacturing capacity.

#### Telecom Equipment Manufacturing in India and increasing dependence on Imports



Source: TEMA, PwC Analysis

According to TEMA (Telecom Equipment Manufacturers Association), the apex organization representing the Telecom manufacturers in India, the value addition in India is around only 11% (or US \$ 44.6 Million) of the total equipment manufacturing industry revenues in FY'06.

Most of the product categories in which indigenous manufacturing is happening in India are products with low technology requirements. This is largely due to the fact that telecom technology is constantly evolving and requires huge amounts of research and development efforts which has not been taking place in India in any significant measure either in the Government funded institutions or the private sector. The locally manufactured equipments such as transmission and switching equipments, mobile infrastructure (non-electronic portion), telecom turnkey solutions, telecom cables and fixed phone instruments contribute a total of about 70% to the telecom manufacturing revenues.

### Recent developments

In recent years there has been a renewed focus on Telecom manufacturing in India led by mobile handset production set up by Nokia for catering to the domestic Indian market and also using India as a hub for exports. Other global majors including Cisco, Motorola, Ericsson, ZTE and a number of other global manufacturers are also firming up their plans for presence in India. Electronic Manufacturing Service (EMS) providers like Flextronics and Foxconn who supply to Original equipment manufacturers (OEMs) around the globe are also setting up operations in special economic zones (SEZs). With the setting up of operations by component suppliers, there are strong indications of a desirable ecosystem being developed for telecom equipment manufacturing in India.

**Illustrations of proposed Investments by Global vendors in Telecom Manufacturing in India**

<b>Global Vendors</b>	<b>Indicated Investment</b>	<b>Products</b>
Nokia	USD 150 Million	Handset, Base Stations
Motorola	USD 100 Million	Handset, Base Stations
<b>EMS</b>	<b>Indicated Investment</b>	<b>Products</b>
Foxconn	USD 110 Million	Handset, Base Stations, Set-top Box, Computers
Flextronics	USD 100 Million	Handset, Base Stations, Set-top Box, Laser Printer
<b>Component Suppliers</b>	<b>Indicated Investment</b>	<b>Products</b>
Aspocomp	USD 70 Million	PCBs
Powerwave Tech	USD 70 Million	BST casing
Sanmina-Sci	USD 70 Million	Network Components
Perlos	USD 12 Million	Mechanics
Salcomp	USD 10 Million	Chargers

Source: DoT, Ministry of Communication and IT, Business World

**Government initiatives**

The sustenance of the unprecedented growth rate in Telecom and reduction in the urban-rural divide necessitates need for extensive research and talent development to overcome the barriers that have lead to the growth being confined to urban areas. Additionally, the increased use of new technologies, the move towards corporatisation and competition, and the separation of regulatory functions from operational services requires advanced level policy, regulatory, managerial and technological expertise.

In order to develop and strengthen the capability to generate this expertise in India, Department of Telecommunications (DoT), India has proposed setting up of Telecom Centre of Excellence (TCoE) in Public-Private Partnership (PPP) mode in different parts of the country with the partnership of the industry stakeholders.

It is proposed to set up eight TCoEs across India. In order to bring in excellence, each TCoE will focus on one primary activity areas in telecom domain. The areas of specialization have been assigned to each COE depending on their current/potential core strength:

<b>Sl. No.</b>	<b>Field of Excellence in Telecom (Tentative)*</b>	<b>Associated Institute</b>	<b>Sponsor</b>
1.	Next Generation Network & Network Technology	IIT, Kharagpur	Vodafone-Essar, Texas Instruments
2.	Telecom Technology & Management	IIT, Delhi	Bharti Airtel
3.	Technology Integration, Multimedia & Computational Mathematics	IIT, Kanpur	BSNL, Alphon
4.	Policy, Regulation, Governance, Customer care & Marketing	IIM, Ahmedabad	IDEA Cellular
5.	Information Security & Disaster Management of Info Infrastructure	IISc Bangalore	Aircel, Texas Instruments
6.	Telecom Infrastructure & Energy	IIT Chennai,	Reliance
7.	Rural Applications	IIT, Mumbai	Tata Teleservices
8.	Spectrum Management (Proposed)	WPC, Chennai	Government, Industry Consortium

Key issues related to Telecom Manufacturing in India are:

- Technology obsolescence & inadequate availability of Technology – Equipment manufacturers in India do not have access to high end technology required for manufacturing of certain class of equipments like Mobile infrastructure & handsets, Transmission and switching etc. Technology and consequent Intellectual property (IP) development for all these class of equipments requires extensive research and development which is currently not happening in India either in the public or private sector.
- Non-availability of reliable component base in India – Equipment manufacturers in India face the problem of unavailability of components due to dearth of components manufacturers in India. As a result, a reliable manufacturing ecosystem did not get established in India and resulted in a vicious loop for both component suppliers and manufacturers. Due to the wide availability of price competitive components from Chinese markets and low production volumes in India, Indian manufacturers and other entrepreneurs are not interested in setting up component supply units.
- Constraints in Import of components – The equipment manufacturers often face problems during the import of components relating to clearance of goods at ports which is mainly due to complex formalities and tedious documentation like Invoices, Packing List, Bill of Landing / Delivery Order, GATT declaration forms, Importers declarations, Import License or attested photocopy when clearance is under license, Letter of Credit / Bank Draft , Insurance memo or insurance policy,

Certificate of country of origin, Technical literature, Split up of value of spares, components and machinery, no commission declaration etc.

- Availability of Finance - Small and medium level equipment manufacturers in India face problems in obtaining finance for setting up operations due to their planned small scale which does not allow for economies which are required to compete effectively in this market. Vendor financing of service providers, which is an accepted norm in the industry, require manufacturers to provide extended credit periods to service providers leading to additional significant finance requirements.
- Poor Infrastructure in India: There is significant deficiency of Infrastructure in India related to roads, ports and electricity which adversely impacts the manufacturing operations in terms of transportation of components and finished equipments, timely arrival and clearance of imported components at ports, logistics issues etc. Competitive destinations in Telecom manufacturing like China, Taiwan etc have or are in the process of speedily developing the required infrastructure thus creating natural for manufacturing operations to flourish
- Cost Competitiveness : The equipment manufacturers in India are not being able to compete with manufacturers like China who have achieved global scale and consequent cost competitiveness mainly due to following :
  - Except for labour, manufacturing costs are higher in India as compared to benchmark countries. In labour costs also experts have raised productivity issues since labour productivity in India is considered to be lower compared to other countries like China.
  - Higher duties on import of components, poor infrastructure related additional direct and indirect costs as compared to benchmark countries are other reasons for lower cost competitiveness of India industry.
- Difficulty for lesser known vendors to procure real estate for manufacturing facilities at reasonable rates and at locations closer to availability of required labour force is also seen as a barrier for telecom manufacturing.
- Numerous Labour laws: There are numerous labour laws in India which are not effectively updated with the change in market scenarios. According to World Bank estimates, in 2004, there were 482 cases of major work stoppages, resulting in 15 million human days of work loss. Between 1995 and 2001 around 9% of factory workers were involved in these stoppages. The comparative figure for China is close to zero. Additionally, India has complex web of legislation which leads to a very slow system of dispute resolution.

## **Section VI – Enabling Regulatory Framework for achieving desired goals**

In India as in most countries, telecommunications policy makers and regulators no longer regulate a static, monopolistic industry that provides essentially a single product, telephone service, but a dynamic, multi-product, multi-operator industry. This environment is a fast-changing and an increasingly complex one where regulators face reduced scope for discretionary decisions.

Increasingly there is also convergence of technologies in telecom, entertainment and media and broadcasting on account of digitalization and increasing use of IP technology resulting in market related convergence in Information, Communication and Entertainment markets. From a regulatory standpoint the important issues are the implications of such convergence on competition and the nature of regulation in future.

### ***Need for predictable policy framework***

The existing policy and regulatory setup in India has in the past provided able support to the Indian telecom sector through its timely policy and regulatory intervention. However, now more than ever when India Telecom services industry has achieved global scale and is attracting interest and investments internationally, there is need to create a predictable framework for policy and regulatory intervention to sustain and grow the interest of the international community and facilitate the expansion of the Indian operators for wider service coverage.

E.g There is no laid out regulatory roadmap and time table announced by Department of Telecommunications for introduction of mobile number portability and carrier pre-selection for long distance services. The need of the Industry is to know beforehand the conditions precedents that will bring forth the review and introduction of these regimes and the key contours of the regime in each case. Such a roadmap available to industry players in advance, would aid in improved business planning and positive impact on the overall image and credibility of the policy and regulatory regime in India.

Even the recent policy announcements relating to mobile number portability, though welcome in the larger consumer interest of increased competitiveness, is silent on the rationale of the move and does not provide concrete policy arguments for the timing and manner of the announcements made and does not provide the stakeholders any guidance on how crucial issues regarding implementation of this announcement are expected to take shape..

### ***Spectrum Management***

In the emerging world of anytime, anywhere communications needs, spectrum is a prerequisite for a diverse range of services such as commercial mobile voice and data services, broadband wireless services, terrestrial broadcasting services, mobile satellite

services etc. These services will require higher amounts of spectrum due to growing demand for higher data rate services in all environments ranging from stationary to highly mobile with the same quality of service. On the other hand, heightened emphasis on national security, need to foster national priorities such as space programs, cooperative international science and technology efforts, providing education and health to users in rural areas etc are the government priorities. The commercial spectrum demands made by the Industry are real but need to be balanced with these government drivers for more spectrum.

Efficient spectrum management has to involve a combination of approaches encompassing increased spectrum sharing, improving efficiency of already allocated spectrum, spectrum reallocation and market based spectrum pricing. With the ongoing convergence in technology and markets, it will also be critical to address the issue of how to transition from a service based and sometimes technology specific spectrum allocation regime to one that is service and technology neutral. The new regime should have flexibility in spectrum allocation to take full advantage of new services and new technologies for existing services that may evolve with time. The role of market mechanisms in such a transition will be crucial for the successful transition to the new regime.

### ***Need to move beyond voice based services regulation towards Convergent Regulation***

With the increasing convergence of technology and markets becoming a reality, there is need for a comprehensive regulatory framework in India that recognizes and provides an enabling environment for new services to grow and enrich the lives of its citizens.

The Communication Convergence Bill, 2001 introduced in Lok Sabha in 2001 was intended as an enabling legislation designed to fully harness the benefits of the converged technologies and the emerging converging technologies of the future to meet the growing social and commercial needs. It intended to set up a single Regulator - Communications Commission of India with powers to deal with the carriage & content. In 2005, TRAI recommended that Unified Licensing Regime be introduced in India. It recommended four categories of licenses, namely Unified License, Class License, Licensing through Authorization and Standalone Broadcasting & Cable TV Licenses with Unified License at the highest hierarchical level. The unified license would have enabled a licensee to provide any or all telecom services by acquiring a single license. None of the above policy and regulatory initiatives have reached the acceptance stage so far.

Internationally, regulatory framework in various countries is moving towards simplified authorization/converged licenses. Such licensing regimes enable provision of various services, both existing and new, by the service providers without the need for separate additional licenses, with the same media being used for different services which builds economies of scale and scope. In these regimes, spectrum is not a part of the license and is awarded separately based on well defined market based mechanisms. Such frameworks have facilitated improved services at lower prices to the customers.

The intent of introduction of new Regulation is that hindrances to growth of new services are removed so that the existing roadblocks that prevent benefits of emerging technology to reach customers are also removed towards establishment of a vibrant Communications sector.

## **Section VII – Key initiatives in the offing**

### ***3G Licensing and Services rollout***

India, while contemplating the various aspects of introduction of 3G services is standing at the threshold of future technology that holds the promise of facilitating converged voice, data, Internet and multimedia services supported by high data rate for its 200 million and growing group of mobile users. In addition, 3G based services is also expected to provide higher voice capacity and improved spectrum efficiency.

Recently, Department of telecom(DoT) has indicated that 3G spectrum will be auctioned but the exact contours of the spectrum allocation policy including timing, bid process, bid eligibility criterion etc. are still to be announced.

Meanwhile, DoT has allocated frequencies to CDMA-based operators in the 1900 Mhz band and to GSM players in the 2100 Mhz band for field trials.

### ***WiMax based broadband services***

WiMax, high-speed internet access over a wireless connection, is a low-cost way to provide internet connectivity in places where laying cables is difficult and is said to be a technology that can be applied in both developed and developing markets. Industry players say the real potential for WiMax is in the developing world as WiMax is much more about data applications, and in developing markets there are huge populations that still do not have fixed line based DSL connections and wireless technologies like 3G and High Speed Packet Access (HSPA) are more expensive and not yet available.

India like other similar economies is pinning its hopes on WiMAX to provide service to underserved rural areas and view this technology as a shortcut to help provide broadband connectivity to rural and remote areas.

Earlier this year, in a move that will help roll-out of WiMax services, DoT has delicensed 50 MHz of spectrum in the 5.8 GHz band for commercial use. The move assumes importance as the global WiMax forum has identified three frequency bands: 5.8 Ghz, 2.5 Ghz and 3.5 GHz, to deploy systems using this technological platform. Of these three frequencies, the world over, only the 5.8 Ghz is a licence-exempt band, and therefore the Department of Telecom's move to delicense this frequency puts India in line with global standards. DoT has already initiated moves to get spectrum vacated for WiMax services in both the 2.5 GHz and 3.5 Ghz frequencies, currently in use respectively for Insat series of satellite communications and satellite television broadcast.

A number of operators in India such as BSNL, MTNL, Aircel, VSNL are currently running WiMax trials to test its readiness for commercial use in India.

## ***Internet Protocol Television (IPTV)***

IPTV is a new method of delivering and viewing television programs using an IP network and high speed broadband technology. IPTV is interactive because of availability of return path. Therefore, it is capable of providing Video on Demand (VOD), time shifted television and many other exciting programs.

Internationally in more developed markets, in the past years, Telecom operators have successfully launched broadband access that became a viable replacement for the declining switched-voice business, impacted mainly from fixed-mobile substitution. With broadband access price decline due to increasing commoditization and competition from the triple-play offerings of cable operators (who provide broadband access, TV, and telephony on a single platform), Telco operators are turning towards IPTV services as a way to support broadband penetration and increase their ARPU. Though more operators are moving to commercial IPTV launches, but adoption is developing slowly. Typically, incumbents have the largest share of IPTV customers. Uptake is fastest in those markets where competition from operators has resulted in aggressive marketing and pricing. Owning networks and supplying set-top boxes are not pre-requisites for delivering television and films over IP networks. Competition to telcos and ISPs is stiffening as media and software companies are making video content available online. Hong Kong's PCCW is globally the leader on IPTV deployment, with over 700,000 subscribers by 2006. In Europe, France Telecom was the largest IPTV provider, with more than 400,000 subscribers at the end of 2006. In USA, Verizon has announced significant investments in fibre till home for its Fios TV which is an IPTV service.

Closer to home, Mahangar Telephone Nigam Limited (MTNL) had announced the launch of its IPTV service in Delhi a year back and is currently working with its partner to tie up content agreements with various TV channels. Bharat Sanchar Nigam Ltd (BSNL) has recently announced launch of its IPTV services using Asynchronous Digital Subscriber Line (ADSL) - two plus technology. According to BSNL, apart from the bouquet of TV channels, the other video content will be provided through outsourcing and it would be delivered through content delivery network centre of the service providers through Video on Demand (VOD) facility. Bharti Airtel is also currently undergoing trials for IPTV services. Recently Reliance Communications and Microsoft have announced a strategic partnership to provide IPTV services in the country by early 2008. Reliance Communications plans to leverage its nation-wide infrastructure to deliver TV services, including video-on-demand, digital video recording, instant channel changing and personal media sharing services on the IPTV platform.

Internet Protocol Television (IPTV) is a term that many people use but few can define. Consumers are confused about what it means. And IPTV services themselves are divided into two forms: one distributed via the PC ('web-TV'); the other via the TV using a set-top-box on a closed broadband connection (IPTV). What's more, IPTV services are entering an already crowded and competitive TV market characterised by established players and ongoing innovations such as HDTV. It is an issue that embraces everyone from telcos, to advertisers, to content providers and to broadcasters.

If telecoms operators' investment in high-bandwidth networks is to create the hoped-for returns from IPTV, they first need to convince consumers of its benefits.

In fact, the most viable IPTV strategy may be a hybrid approach, delivering broadcast TV over platforms such as DTT, satellite or cable, and on-demand and interactive content over broadband.

Whatever approach they choose, any operator delivering IPTV will need to focus on a marketing led solution, and closely look at the organisational and cultural changes that need to accompany a successful IPTV business. Core to this is partnering - possibly including outsourcing - and investment in content and advertising expertise. Once they get the technology to work, they still face the daunting hurdle of knowing what content to offer to customers. This requires thinking beyond exclusive premium sports rights and exploiting the 'long tail' of content.

For IPTV services that launch and operate successfully, the 'ace in the hole' is that IPTV offers a new, more compelling model for advertisers to reach and influence consumers. To exploit this opportunity, operators need to seize the initiative by proactively providing the feedback mechanisms that will support new commercial models.

*Source: PwC white paper "Show me the money" Strategies for success in IPTV\**

## ***mBanking***

Mobile banking (m-banking) involves the use of a mobile phone or another mobile device to undertake financial transactions linked to a client's account. Mbanking is one of the newest approaches to the provision of financial services through ICT, made possible by the widespread adoption of mobile phones even in developing and under developed countries. The roll out of mobile telephony has been rapid, and has extended access well beyond already connected customers in developed countries. A mobile network offers a high technology platform onto which other services can be often provided at very low cost to deliver an effective result. Mobile data channels are often under-used and therefore may be offered at low cost by the network operator. M-banking services which use channels such as SMS can be carried at a cost of less than USd 1 cent per message. The low cost of using existing infrastructure makes such channels more amenable to use by poor customers. Although m-banking is one channel in the wider domain of e-banking, there are reasons to single it out for focus—especially

because mobile phone usage has reached critical mass numbers in countries with few banked individuals

The emerging models of m-banking can be placed in four categories, based on the different roles played by the parties involved: the bank, the telco and in some cases, a third party product provider. The models vary from one in which a bank adds on a mobile channel to its existing product range, through hybrid models where a telco may bring different branding, product set and/or distribution system to a bank-based product, to a telco-dominated model in which the telco itself is responsible for the deposits taken.

M-banking is new in most countries, Outside of East Asia, most m-payments models have operated at limited scale in most of the developed world to date. However, micro-payments connected to the purchase of premium rated services on a mobile phone have relatively grown faster. Among developing countries, Philippines already has around four million users of the mobile financial services offered by its two major network operators, Smart and Globe. Various m-payment and m-banking products are on offer in different parts of Africa today, but they have not reached a substantial scale.

The Indian government had also welcomed the mobile money transfer (MMT) programme promoted by the GSM Association at the 3GSM World Congress 2007. The MMT programme is focused on catering to the needs of the large expatriate community of people from developing countries who live and work away from their homes and families and regularly remit money back to their families. It is relevant and important in the Indian context as India is the largest recipient of international remittances from about 20 to 25 million Indians working across 130 countries and World Bank estimates that in 2005, Indian expatriates remitted over USD 22 billion to India.

### **Launch of mobile based payment service**

It was recently announced that Bharti Airtel is set to unveil a mobile money transfer service in India. It will launch a host of value-added services, primarily related to M-commerce applications. These include the platform that allows both its prepaid and postpaid users to link their credit card, debit card or bank accounts to their mobile connection.

The above launch will make Bharti the first operator in the country to offer such services. Earlier this year, the Reserve Bank of India had given the nod to Bharti Airtel and State Bank of India(SBI) to launch the project in the country as 'not-for-profit companies' under Section 25 of the Companies Act.

The field of m-payments and m-banking involves the overlap of several regulatory domains—those of banking, telco and payment system supervisors, and anti-money laundering agencies. The overlap substantially raises the risk of coordination failure, where legislation or regulatory approaches are inconsistent or contradictory. A comprehensive vision for market development between policy makers, regulators and industry players can help to define obstacles, design proportionate responses to risk

towards establishment of an efficient and cost effective channel for the “unbanked” population in India.

## **Section VIII– The Road ahead**

### ***Resolution of the 2G Spectrum related issues***

The spectrum related roadmap and associated issues of quantum of spectrum, availability and its timing, both for 2G and beyond needs to be resolved amicably with minimum litigation so as to keep sector growth on track. Recently, Government of India(GoI) has accepted the TRAI's recommendation of enhanced subscriber linked criterion for frequency allocation and has set up a committee in Telecom Engineering Centre (TEC) to further study and give a report to the Government. Additionally it has allowed Universal Access Service(UAS) Licensee who is using GSM technology for wireless access to use CDMA technology and vice-versa potentially changing market dynamics and opening the sector to conflicts which should be settled at the earliest.

### ***Expansion of services in rural areas***

Improved rural connectivity is a priority for both the Government and the industry. Some of the initiatives undertaken by the government like subsidy support from USO Fund to set up shared mobile infrastructure in rural areas and measures adopted by the telecom operators like active participation by operators in USO tenders, development of special tariff packages for rural areas, utilization of micro pre-paid cards and local language content highlight the focus towards providing affordable access in rural areas.

WiMax is potentially an effective alternative, suited for last mile wireless connectivity at higher bandwidths and over widespread geographic area, for spreading affordable broadband access in rural areas.

### ***Establish criterion for allocation of 3G service licenses***

It is essential for the Government of India to come out with a timetable for launch of 3G services as the delay in process is setting India back on its path to gain access to technologies that could increase efficiencies in work environment, provide infotainment and open newer revenue streams for its Telecom operators.

Additionally, the world is watching India now for its next move on this tricky 3G licensing issue and in order to build on the "India Rising" story, it would be crucial to announce a well deliberated 3G roadmap that can hold forth on principles that encourage competition and provision of most cost efficient services to the customers.

### ***Reduce high Regulatory Levies***

Indian Telecom has the one of the highest regulatory levies and duties leading to Operators contributing about 15-25% of their gross revenues towards these charges. In light of the increased capital expenditure that will be incurred by the Operators to expand operations in rural and semi-urban areas it is imperative that Gol reduces these charges to International precedents in benchmark economies (less than 5%) to counter per unit falling margins and fuel expansion.

***Promote India as a Telecom manufacturing base and hub for regional exports***

Government of India needs to take cognizance of the increasing dependence of Indian operators on imports to fulfill their telecom equipment demand and actively promote India as a manufacturing base and as a hub for regional exports. This task is less onerous than it was a couple of years back as Indian domestic market with its burgeoning demand for telecom services could provide the scale for manufacturing operations coupled with its strategic geographical location for regional exports.