Telecommunications

9.30 After the announcement of New Telecom Policy 1999, progress in telecom in India has been extremely rapid. The total number of telephones (basic and mobile) rose from 22.8 million in 1999 to 88.6 million at the end of October, 2004. During 2003-04 itself,

Box 9.3 : Salient features of National Electricity Policy

1. **Objectives :**
   (a) Access to electricity-Available for all households in next five years.
   (b) Availability of Power-Demand to be fully met by 2012. Energy and peaking shortages to be overcome and spinning reserve to be available.
   (c) Supply of Reliable and Quality Power at specified standards in an efficient manner at reasonably rates.
   (d) Per capita availability of electricity to be increased to over 1000 units by 2012.
   (e) Minimum lifeline consumption of 1 unit/household/day as a merit good by year 2012.
   (f) Financial Turnaround and Commercial Viability of Electricity Sector.
   (g) Protection of consumers' interests.
2. CEA to notify first National Electricity Plan in six months with a perspective up to 12th Plan period. The Plan prepared by CEA to be used by prospective generating companies, transmission utilities and transmission/ distribution licensees as reference document.
3. Development of Rural Electrification Distribution backbone, village electrification and household electrification to achieve the NCMP target of completing household electrification in next five years. Financial support in terms of capital subsidy to States for rural electrification. Special preference to Dalit Bastis, Tribal Areas and other weaker sections for rural electrification. REC to be nodal agency for rural electrification at Central Government level.
4. Creation of adequate generation capacity with a spinning reserve of at least 5 per cent by 2012 with availability of installed capacity at 85 per cent.
5. Full development of hydro potential. Provision of long term finance for these projects.
6. Choice of fuel for thermal generation to be based on economics of generation and supply of electricity.
7. Development of National Grid.
8. Cost of recovery of service from consumers at tariff reflecting efficient costs to ensure financial viability of the sector.
9. Provision of support to lifeline consumers (households below poverty line having consumption of 30 units per month) in terms of tariffs.
10. Availability based tariff (ABT) to be extended to State level for better grid discipline through economic signaling.
11. Special emphasis on time bound reduction of transmission and distribution losses.
12. Measures to promote competition aimed at consumer benefits.
13. Reliability and quality of power supply to be monitored by State Electricity Regulatory Commissions.
14. Exploitation of non-conventional energy sources such as small hydro, solar, biomass and wind for additional power 'generation capacity.
15. Central Government to facilitate the continued development of national grid. CTU and STU to undertake coordinated planning and development.
16. Transmission capacity to have redundancy level and margins as per international standards.
17. Adequate transitional financial support for reforming power utilities. Encouragement for private sector participation in distribution.
18. The State Regulatory Commissions to put in place independent third party meter testing arrangement.
19. Support for adoption of IT system for ensuring correct billing to consumers.
20. Speedy implementation of stringent measures against theft of electricity.
21. Full emphasis on augmentation of R&D base. Mission approach for identified priorities areas.
22. Demand side management through energy conservation measures. Label regarding energy efficiency to be displayed on appliances. Efficient agricultural pump sets and efficient lighting technologies to be promoted. Appropriate tariff structure for managing the peak load.
23. Special attention for developing training infrastructure in the field of regulation, trading and power market.
24. For giving boost to renewable and non-conventional energy sources, a prescribed percentage of power as specified by State Regulatory Commission to be purchased from such sources of energy at the earliest.
25. Necessary regulations and appointing Ombudsman for redressal of consumers' grievances to be in place in six months.

Table 9.8 : Growth of telephones over years								
Year	Fixed in Million			% of PSUs	Mobile incl. WLL mobile (in Million)			% of PSUs
	PSUs	Pvt.	Total		PSUs	Pvt.	Total	
2001-02	37.90	0.52	38.42	98.65	0.26	6.28	6.54	3.98
2002-03	40.53	1.10	41.63	97.36	2.64	10.35	12.99	20.32
2003-04	40.49	2.36	42.85	94.49	5.99	27.70	33.69	17.78
2004-05 (Oct.)	40.33	3.80	44.13	91.39	8.99	35.50	44.49	20.21

21.92 million telephones were added, which was equal to the total number of phones installed as of 1999. During the first seven months of the 2004-05, 12 million phones have been added. Overall, tele-density rose from just 2.32 in 1999 to 8.2 in October 2004.

9.31 The structure and composition of telecom growth has undergone a substantial change in terms of mobile versus fixed phones and public versus private participation. In 1999, both mobile phones and private sector separately accounted for 5 per cent of total number of phones. In October 2004, mobile phones accounted for 50 per cent of total phones and the private sector accounted for 44 per cent of total phones.

9.32 Mobile phones were once considered a luxury. In recent years, it has become clear that the capital costs of mobile telephony are lower, which makes mobile telephony the technology of choice for low-price telephony. Affluent households are going from one fixed line per family (analogous to a tele-density of 20) to one mobile phone per person (analogous to a tele-density of 100).

9.33 Few areas of India's economy have enjoyed as sharp a pace of structural change as that in the telecom sector. The rapid pace was the outcome of vigorous competition among firms and technologies. This drastic pace of structural change highlights the possibilities in other segments of infrastructure for eliciting massive investment by the private sector, and for benefiting the consumers through competition between old and new technologies.

9.34 Although India's 88.62 million strong telephone network, including mobile phones, is one of the largest in the world, with the low telephone penetration rate of about 8.20 phones per hundred population, the country offers vast scope for growth. Present projections suggest that by the end of 2007, the total number of phones could reach 250 million.

9.35 Over the recent period, public sector operators (BSNL and MTNL) have lost market share in fixed telephony from 98.65 per cent to 91.39 per cent (Table 9.8). In the past two years, Public Sector Undertakings (PSUs) have actually seen a decline in the number of fixed lines, while such lines have grown in the private sector. At the same time, the PSUs actually gained market share in mobile telephony, going from 3.98 per cent to 20.21 per cent share of the market. Overall, the share of PSUs declined from 90 per cent to 55.6 per cent.

9.36 While tele-density has risen sharply, India continues to lag far behind countries like Brazil and China, where the tele-density is more than 40 (Table 9.9). In order to 'catch up', there is a need to maintain vigorous pro-competitive efforts in terms of public policy, rapidly shift to new technologies, encourage entry of new players, and drive prices down through competition. The policy initiatives taken in the telecom sector recently address some of these issues (Box 9.4).

Table 9.9 : International comparison of Teledensity, December, 2003	
Countries	Teledensity
Australia	126.18
Bangladesh	1.56
Brazil	42.38
China	42.32
India	**6.60**
Indonesia	9.17
Nepal	1.70
Pakistan	4.42
Sri Lanka	9.57
U.K.	143.13
U.S.A.	116.43
Source : ITU.	

Box 9.4 : Major Policy Initiatives in Telecom Sector

- Broadband Policy announced on October 14, 2004
- Indoor use of low power equipments in 2.4 GHz band de-licensed from August 2004
- In April 2004, license fee for UAS reduced by 2% is in the range of 6-10% while that for CMTs is in the range of 8-12%
- Performance Bank Guarantee in respect of NLDS license reduced in June 2004 from Rs. 100 crore to Rs. 50 crore for each phase
- License for Infrastructure Provider-II reduced in June 2004 from 15% to 6% of the AGR
- ISPs permitted to use underground copper cable for establishing their own last mile linkages
- In Budget 2004-05 —
  - — Benefits under Section 80-IA provided for companies starting after May 31, 2005
  - — Customs duty exemptions provided on mobile switching centres for Unified Access Service Providers, optical fibre cable and raw materials required for optical fibre
- Bank Guarantee for IP-II category reduced in March 2004 from Rs. 100 crore to Rs. 5 crore
- The operation of Automated spectrum management system has commenced
- National Internet Exchanges set up during September 2003 – February 2004
- Guidelines issued for intra-circle mergers of licenses in January 2004
- After the introduction of Unified Access Service regime, all the Basic Service licensees have migrated to UASL.

Table 9.10 : The Telecom Industry—Firm level data

Company Name	Year	Sales	Profit after tax	Gross fixed assets	Gross value added	Market Cap on NSE as on 27th Jan., 2005
Bharat Sanchar Nigam Ltd.	2002-03	27,492	1,444	94,678	20,177	
Mahanagar Telephone Nigam Ltd.	2003-04	6,370	1,150	14,072	3,966	9,047
Videsh Sanchar Nigam Ltd.	2003-04	3,164	378	2,463	1,861	5,801
Bharti Cellular Ltd.	2003-04	2,187	137	3,652	879	
Bharti Infotel Ltd.	2003-04	2,114	341	3,058	800	
Bharti Mobile Ltd.	2003-04	1,179	182	1,535	568	
Idea Cellular Ltd.	2003-04	1,166	-207	2,388	426	
B P L Mobile Communications Ltd.	2002-03	453	-25	946	210	
Aircel Ltd.	2003-04	247	23	598	205	
Reliance Telecom Ltd.	2002-03	357	-299	522	197	
Escotel Mobile Communications Ltd.	2003-04	421	-105	935	197	
Fascel Ltd.	2002-03	363	11	507	153	
Tata Teleservices (Maharashtra) Ltd.	2003-04	598	-270	2,258	117	4,089
Aircel Cellular Ltd.	2003-04	153	19	280	85	
Hexacom India Ltd.	2002-03	115	13	133	66	
B T A Cellcom Ltd.	2003-04	131	-15	274	44	
Bharti Tele-Ventures Ltd.	2003-04	30	0	32	40	38,847
Aircel Digilink India Ltd.	2001-02	93	-2	262	33	
Comsat Max Ltd.	2003-04	45	3	58	16	
Shyam Telelink Ltd.	2003-04	95	-94	583	12	
Tata Teleservices Ltd.	2003-04	800	-786	3,519	-141	
Aggregate for 21 firms		**46,736**	**2,683**	**129,234**	**30,047**	**57,783**

9.37 The growth of tele-density has required substantial financial investment. One important source for this investment has been FDI. From August 1991 to August 2004, 926 proposals of FDI of Rs. 41,368 crore were approved. The actual FDI inflow of approximately Rs.5,763 crore between January 2001 and August 2004 alone was about 56 per cent of the total FDI flow in telecom since its inception in 1991. In terms of approval of FDI, the telecom sector is the second largest, after power and oil refineries. While the prices of telecom equipment have fallen sharply, India's push from below 100 million lines to the region of 250 million lines will also involve substantial investment.

9.38 Analysis of firm-level data for the latest available year – 2003-04 for most, except some – show that industry as a whole contributes roughly Rs.30,000 crore per year to GDP, or around 1 per cent of GDP (Table 9.10). This value addition is generated by using Rs.129,234 crore of fixed assets. Some of the firms are now listed on the stock market, and have a market value of Rs.57,783 crore. This market value understates the size of the industry, as many of the firms including BSNL and Reliance Infocomm, are not accounted for because of their unlisted status.

The next frontier: broadband

9.39 Indian telecom is set for high growth rates embracing the wider population, when it comes to ordinary voice telephony. While India's tele-density lags behind the world, present trends suggest that catching up is presently underway. India also lags behind the world to a considerable extent in the field of broadband telecom. At end-December, 2003, penetration of Broadband, Internet and Personal Computer (PC) in the country was 0.02 per cent, 0.4 per cent and 0.8 per cent respectively. As per the Broadband Policy announced on October 14, 2004, broadband has been defined as an "always-on" data connection supporting interactive services including Internet access with minimum download speed of 256 Kbps per subscriber. The broadband policy aims to target three million broadband subscribers and six million Internet subscribers with a timeframe of December 2005. Further, it is targeted that, by 2007, the broadband subscribers would be 9 million. By the end of the year 2010, the policy aims to target 20 million broadband subscribers and 40 million Internet subscribers.

9.40 The prime consideration guiding the policy includes affordability and reliability of broadband services, incentives for creation of additional infrastructure, employment opportunities, induction of latest technologies, national security and bringing in a competitive environment to reduce regulatory interventions. The new policy encourages creation and growth of infrastructure through various access technologies which can mutually co-exist like optical fibre technologies, digital subscriber lines on copper loop, cable TV network, satellite, and terrestrial wireless technologies. The choice is left to the service provider.

9.41 Ability to emulate the success of many other Asian countries in the broadband area will have major implications for smoothing intra-India commerce and industry, knowledge flows into India, e-governance, greater integration into the world economy through international voice and videoconferencing traffic and lower prices for NLD and ILD traffic, and services exports such as software and "business process outsourcing".

9.42 Of the more than 40 million copper loops in the country available with BSNL and MTNL, 14 million loops are in the rural areas. Taking into account the condition/life of copper cable and demand potential, around 7 million loops can be leveraged for broadband service by BSNL and MTNL. BSNL and MTNL have decided to provide 1.5 million connections by the end of 2005. The corporate/work plans of these PSUs have been drawn up for this purpose. The core network for 71 cities throughout the country has been set up by BSNL/MTNL. Broadband services have already been launched by BSNL and MTNL on January 14, 2005. They propose to cover 198 cities in addition to Delhi and Mumbai by April 2005.

9.43 The broadband services have been launched only recently and, with the increase in volume and competition, the cost of these

services are likely to decrease. One international comparision, showed in Box 9.5, suggests the opportunities for lower prices in this area. Internet bandwidth will become cheaper to the extent that domestic traffic is switched within the country, and servers accessed by Indian users are located within the country. The National Internet Exchange of India (NIXI) has been set up by DIT to ensure that Internet traffic, originating and destined for India, is routed within India.

Universal Service Obligation Fund

9.44 A challenge common to most infrastructure services is the need to undertake special efforts to ensure coverage in rural areas. The traditional strategy in India has consisted of using cross-subsidies, charging urban consumers more and rural consumers less. The Universal Service Obligation Fund (USOF) in India's telecom sector is a unique institutional innovation which ensures provision of services at minimum cost in rural areas through a system of open bidding. At present, USOF is funded by imposing a levy of 5 per cent of adjusted gross revenue of telecom companies.

9.45 Rural telephony services provided under the aegis of USOF involve payments from the fund for both capital cost and maintenance and operational costs, through an open and transparent bidding system. Through USOF, fiscal support is delivered to pay phones and individual household phones in rural areas and in remote areas where producing telecom services is costly. It endeavours to implement universal public access broadband through installation of High Speed Public Telecom Information Centres at Block headquarters and in villages, with population of more than 2000. Provision of Village Public Telephones (VPTs) in all villages and provision of additional Rural Community Phones (RCPs) in nearly 46,000 villages with population more than 2000 are also covered. From 2002-03 to 2004-05 about Rs.6,696 crore are estimated to have been collected for the USO Fund. The entire budgetary provision of Rs.1700 crore allocated for the financial years 2002-03, 2003-04 and 2004-05 has been fully utilised.

Box 9.5 : Price of Broad band connectivity — one international comparison

	MTNL	UK Online
Bandwidth speed Upload/ Download	512/ 512 kbps	400/ 8192 kbps
Free download (monthly)	2.5 GB	500 GB
Price (monthly)	Rs. 2,399	Rs. 3,239

Note: UK Policy framework uses local loop unbundling.

The Electromagnetic Spectrum

9.46 The electromagnetic Spectrum is a scarce natural resource, which needs to be allocated in ways that maximize its economic value. The trend in modern telecommunications is towards mobility, for which radio frequency spectrum is one of the essential ingredients. Government policies on spectrum allocation are a major factor in shaping the future of the telecom industry. Government has adopted a technology neutral policy in the telecom sector.

9.47 Efforts are being made for introduction of newly emerging radio communication technologies, without unduly constraining the other existing operations. There has been an ongoing process of addressing bottlenecks in spectrum availability as and when they are encountered. In this regard, automated spectrum management system has been commenced in January, 2005.

Trends in Telecom Tariff

9.48 There has been a dramatic fall in the tariffs due to increased competition. The tariffs for local calls have fallen considerably in recent months particularly for cellular and WLL (Table 9.11) The peak long distance tariff between

Table 9.11 : Tariff for local calls

	Mar. 03	June 03	Sept. 03	Dec. 03	Mar. 04	June 04	Sept. 04
Fixed	0.69	0.78	0.78	0.78	0.78	0.65	0.65
Cellular	1.63	1.12	0.77	0.77	0.77	0.77	0.77
WLL(M)	0.71	0.67	0.67	0.57	0.44	0.44	0.44

Table 9.12 : Tariff for long distance calls						
Distance	**1999-2000**	**2001**	**2002**	**March 2003 onwards**	**April 10-Sept. 09, 2004**	**With effect from Sept.10, 2004**
Upto 50 Kms	1.20	1.20	1.20	1.20	1.20	1.20
Above 50 Kms and uto 200 Kms.	6.00	4.80	4.80	2.40	2.40	2.40
Above 200 Kms and upto 500 Kms.	15.60	12.00	4.80	4.80	3.60	2.40
Above 500 Kms. And upto 1000 Kms.	21.60	18.00	9.60	4.80	3.60	2.40
Above 1000 Kms.	30.00	24.00	9.60	4.80	3.60	2.40

Delhi and Mumbai has come down from Rs. 30 per minute in 2000 to less than Rs. 2.40 per minute in 2004 (Table 9.12). In the same fashion, international call charges have also come down drastically from Rs. 61.20 per minute in 2000 to Rs. 7.20 per minute in 2004 for the American continent (Table 9.13). Mobile telephony prices have dropped from Rs. 16 per minute to Re. 1 to Rs. 2 per minute.

9.49 In countries like the U.S., mobile telephony subscription packages typically bundle airtime with national long distance (NLD) consumption into a single price per minute of airtime, where the consumer does not differentiate between local calls and NLD calls. This is in sharp contrast to India, given the tradition of very high NLD rates in the country. However, given the introduction of competition in NLD and the consequent drop in prices, tariff packages, which are competitive by world standards, may now appear in India.

Table 9.13 : Recent changes in ILD Tariff			
Country	**From Oct. 2003 to 9th April 2004**	**With effect from 10th April to 20th Oct. 2004**	**With effect from 21st Oct. 2004**
United Kingdom	7.20	7.20	7.20
USA and Canada	9.60	7.20	7.20
Rest of Europe	9.60	9.60	9.60
South East Africa	12.00	9.60	9.60
SAARC countries	21.18	18.00	18.00
Sri Lanka	21.18	18.00	12.00
Rest of the World	24.00	18.00	18.00

Rural telephony

9.50 As on November 30, 2004, more than 5,20,000 villages were connected using a Village Public Telephone (VPT). The remaining 66,822 villages, excluding around 22,000 villages with population less than 100, in insurgency - prone areas or thick forests will be covered in a phased manner in the next three years. More than 2 lakh Public Call Offices (PCOs) are also providing community access in the rural areas. So far, 129 lakh phones have been provided in the rural areas. A pilot program using mobile phones to run a mobile PCO with 2,592 “Gramin Sanchar Sewaks” serving 11,013 villages, was in operation on November 30, 2004.