

## **White paper on Telecom Centres of Excellence,India (TCOE)**

### **Background**

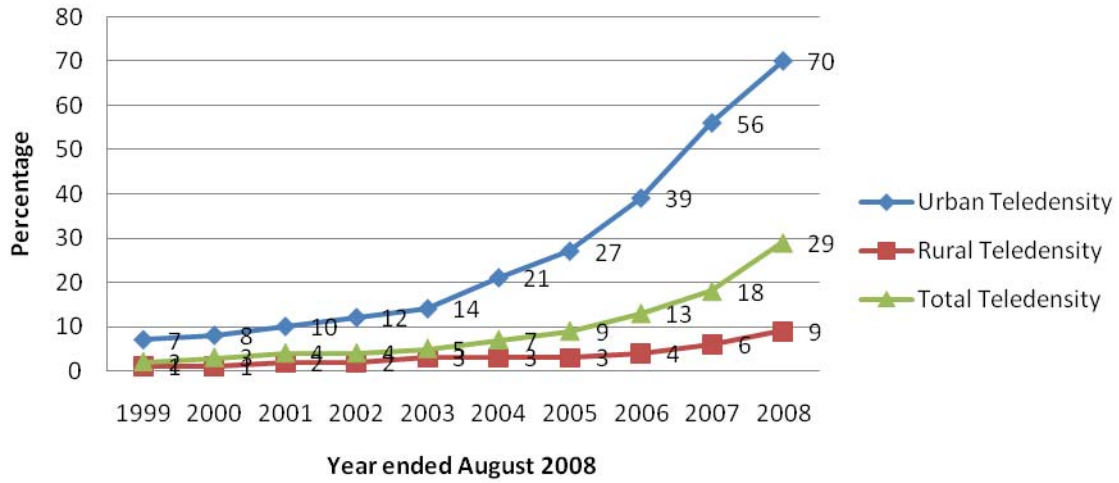
Telecommunication was a state monopoly in India till 1994, when a New Telecom Policy (NTP) ushered in changes. The policy allowed the entry of private sector into both the “Basic” (fixed line or wire line telephony) and the ‘new’ cellular mobile sector that had been left completely un-exploited by the state monopoly. Foreign direct investment up to 49% of total equity was also permitted in these two areas. By 1996 a bill for the setting up of a Telecom Regulatory Authority of India (TRAI) was enacted and by early 1997 the authority had started functioning.

The NTP failed to give the expected impetus to the growth, ostensibly due to lack of entrepreneurial experience in Telecom. However, a comprehensive review involving inputs from a wide circle of experts (economists, finance & telecom) followed and a revised Telecom Policy (New Telecom Policy 1999, NTP99) was introduced in 1999.

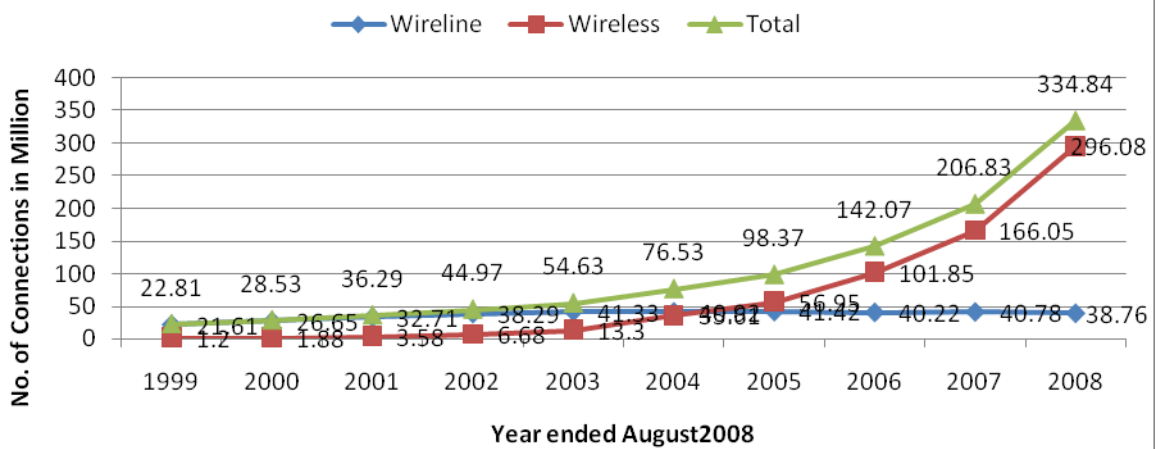
Post NTP99, the growth in Telecom has been stupendous. From an abysmal teledensity of below 1% in 1985, we have now approached teledensity in excess of 26%. Indian telcos are adding 8-10 million subscribers, mostly wireless, a month. The availability and affordability of telecom services have gone hand in hand. The calling rates, including National Long Distance, are among the lowest in the World. The technology has also proved to be an ally in this growth as wireless telecom services can be deployed faster and with much less cost per line as compared to the wireline. Though much needs to be done, particularly in the area of rural telecommunications, which languishes at a teledensity of 8%, much behind the urban teledensity of around 60%, the Government has, on the whole, created a decent eco-system for growth. There are TRAI and TDSAT (Telecom Dispute Settlement and Appellate Tribunal) and frequent consultations with the Industry associations like COAI (Cellular Operators Association of India), AUSPI (Association of Unified Service Providers of India), ISPAI (Internet Service Providers Association of India), Assocham, CII and FICCI.

Indian Telecom has immense future potential. India has already become the second largest country in the world (next to China) in terms of no of subscribers with a projection of 500 Million wireless subscribers and 20 Million Broadband subscribers by 2010. The 3G wireless service is also likely to start by early 2009.

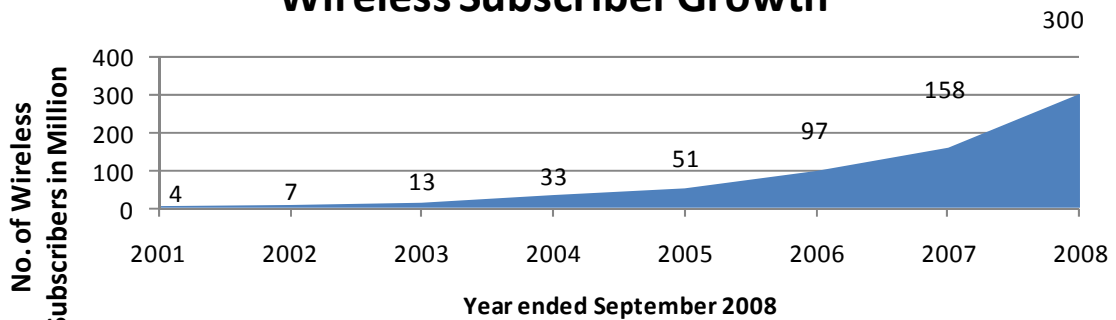
### Teledensity (in percentage)



### Growth of Telephone Connections



### Wireless Subscriber Growth



## **Need for indigenous R&D**

The Telecom sector is considered as the real success story of the economic reforms, having registered impressive growth rate (CAGR) of over 56% during last 4 years. The well known multiplier effect of Telecom has come into play and has played no mean role in registering overall economic growth of 8 to 9% consistently in recent years. The real challenge before the country now is to sustain or further accelerate the growth so that the benefits reach the masses. From now on, the major contribution to growth will come from rural sector where 70% of India lives. As the growth of rest of the infrastructure, literacy and incomes has not kept pace with the Telecom, the challenge of taking telecom services to the remaining, mostly rural, population is going to be different and will require innovative local solutions, not only technical but also of management, regulatory and socio-economic. Such solutions can only come from extensive in-house research and talent development. The New Telecom Policy 1999 (NTP99) of Government of India recognized this and laid great emphasis on Research and Development. An excerpt from the policy is given below:

*'Recognising that telecommunications is a prime pre-requisite for the development of other technologies, telecommunications research and development (R&D) activities would be encouraged. Government would take steps to ensure that the industry invests adequately in R&D for service provision as well as manufacturing. Indigenous R&D would be actively encouraged with a view to accelerate local industrial growth and hasten transfer of technology. Premier technical institutions would be encouraged to undertake R&D activities on a contribution basis by the telecom service providers and manufacturers so as to develop multi-dimensional R&D activities in telecommunications and information technology.'*

It is in pursuance of the NTP99 goals that the idea of Telecom Centres of Excellence initiative was mooted. A committee, comprising officials from DoT, COAI and AUSPI was formed and given responsibility to deliberate and suggest ways for the formation of Telecom Centres of Excellence. The committee submitted its report in May 2007 recommending setting up of seven Telecom Centres of Excellence (TCOE) in Public Private Partnership mode. The TCOE initiative brings together premier technical and management institutions of the country, telecom service providers and the Government (DoT) as an excellent example of PPP mode.

## **Telecom Centres of Excellence India**

The seven Telecom Centres of Excellence (TCOEs) created so far are listed below. Each TCOE is sponsored by a Telecom Operating company (telco) and is hosted by a premier technical / management institute of the country. The main funding comes from the sponsoring telco while Government's support is primarily by way of basic and research infrastructure at the technical / management institutes which are Government established and funded. A focus area of Telecom Research has been identified for each so as not to leave any important area uncovered.

Sl. No.	Name of TCOE	Academic Institute	Principal Sponsor	Focus Area
1	IIMA IDEA Telecom Centre of Excellence (IITCOE)	Indian Institute of Management, Ahmedabad	IDEA Cellular Ltd.	Telecom Policy, Governance, Regulation and Management, esp. Marketing and Customer Care
2	Vodafone-Essar IIT Centre of Excellence in Telecommunications (VEICET)	Indian Institute of Technology, Kharagpur	Vodafone-Essar Ltd.	Next Generation Telecom Networks & Network Technology
3	Aircel IISc Centre of Excellence in Telecommunications (AIIScCET)	Indian Institute of Science, Bengaluru	Aircel Ltd.	Information Security and Disaster Management of Telecom Infrastructure
4	Airtel IIT Delhi Centre of Excellence in Telecommunication (AICET)	Indian Institute of Technology, Delhi	Bharti Airtel Ltd.	Telecom Technology and Management
5	BSNL IITK Telecom Centre of Excellence (BITCOE)	Indian Institute of Technology, Kanpur	Bharat Sanchar Nigam Ltd.	Technology Integration, Multimedia and Computational Maths
6	Tata Teleservices IITB Centre of Excellence in Telecommunications (TICET)	Indian Institute of Technology Bombay at Mumbai	Tata Teleservices Ltd.	Rural Telecom
7	Reliance IITM Telecom Centre of Excellence (RITCOE)	Indian Institute of Technology Madras at Chennai	Reliance Communications Ltd.	Telecom Infrastructure and Energy

### **Vision statement of TCOEs\*\***

To enable all Indians to benefits from telecom technology for improving their quality of life and to also strive to make India a leader in telecom over the next decade.

### **Mission statement of TCOEs\*\***

To create synergy amongst the academia , telecom industry and the government for creation of new services/applications, generation of IPR, development of manufacturing capability, global telecom standardization activities, and promotion of entrepreneurship. To address the technological and management challenges facing the Indian operators in reaching all sections of society through affordable solutions, providing world class services, and having a global presence.

### **Structure of TCOEs**

The TCOEs have, with strong government encouragement and backing, adopted two tier organizational structures consisting of a Governing Council and autonomous local Core Groups (also known as Steering Committees or Boards).

#### **Governing Council**

Formed under the chairmanship of Secretary, DoT, with heads of the seven sponsoring organizations and seven institutes as members, it is the apex strategic planning / decision making body for the TCOEs. A Coordination Centre of TCOEs at New Delhi works as the secretariat to the Governing Council.

#### **Core groups / Steering Committees / Boards**

Each TCOE, vested with full autonomy in management of its local affairs, shall have a local Core Group (also known as Steering Committee or Board). The Core Group shall be chaired by the head of the Institute and shall have representatives from the industry sponsor and the Government (DoT, C-DOT, TEC).

#### **Coordination Centre**

In addition to seven TCOEs, a Coordination Centre has been set up to co-ordinate activities among the TCOEs. It has industry representatives with requisite domain knowledge who have been entrusted responsibility of facilitating working of and sharing of knowledge among the TCOEs so as to bring qualitative improvement in Telecom R&D. It will be the first contact single point interface of TCOEs for external agencies as and when required. Coordination Centre has been set up with infrastructure support from C-DOT and functions from its New Delhi campus.

## **Objectives of TCOEs**

- (a) Creation of market ready talent pool and continuous talent building endeavor through training of the trainer.
- (b) To help create an environment of Innovation in the top academic institutes of the country to enable absorption of the current technology and develop future ready indigenous capability.
- (c) To undertake India specific application development that matches with behavioral pattern of the masses and adds value to their day-to-day activities, both economic and social.
- (d) To provide a platform for think-tank activities to assist Government and Industry decision makers.
- (e) Integration and bench marking of technology that can ultimately lead to form standards for manufacturing and /or rendering services.
- (f) Each TCOE will focus on a niche area of activity in the telecom domain to build excellence that is at par with world standard.
- (g) To undertake cross-pollination of best practices the world over and make it suitable in Indian context. This will help in creating optimal models that avoid duplication and wastage of resources, especially in the field of the converging Information & Communication Technology.
- (h) To facilitate Macro Infrastructure planning that enables a systematic and sustained growth in a cost effective manner.

## **Formation of TCOEs**

The TCOEs came into existence with the signing of tri-partite Memoranda of Understanding (MoU) between the DoT, Government of India, participating institutes and the principal sponsors from the industry. The MoUs define the role and responsibilities of each party. The salient points are given below:

## **Role of hosting Institute**

- a. Facilitate undergraduate/postgraduate/Doctoral/Post Doctoral students or sponsor's nominees to participate in fulfilling the objectives.
- b. Provide requisite technical and residential infrastructure at the campus.
- c. Nominate adequate Principal Investigators (PI) to guide students for result oriented research / training of trainers / project studies / consultancy for Industry.
- d. Facilitate TCOE to work as an autonomous body, retaining the dynamism of private sector, to fast track the process of attainment of objectives.
- e. Make provisions to offer internship to selected B Tech/M Tech students to promote studies /research in telecom domain.

- f. Facilitate TCOE to work out deliverables annually (commercially viable innovations, patents, published papers, prototype development, project/study reports, application development etc) Facilitate Centre to become self reliant through innovative mechanisms after 5 years.
- g. Permit naming of the Centre with the brand name of the sponsor as a healthy symbol of collaboration even beyond the funding period.
- h. Permit first right of refusal to sponsor in case of commercialization of innovations originating from the centre and predetermined revenue sharing models.
- i. Facilitate posting of one full time officer of the sponsor / TCOE to function as resident Project co-coordinator
- j. Provide concessional fee model for training of the sponsor's employees.
- k. Organize seminars and workshops from time to time with mutual agreement among the signatories of the MoU.
- l. Facilitate project review meetings once in six months by the Core group along with other Funding Agency/Industry and co-opted members.

**Role of the principal sponsor**

- a. Timely release of approved budgeted funds as per the payment schedule contained in the MoU or agreed to subsequently.
- b. Registration of TCOE as society under Society's Act with the State Government and to obtain necessary financial clearances to the advantage of the society.
- c. Define priorities when TCOE works on preparation of project proposals.
- d. Facilitate / make available a suitable platform to the TCOE for testing of / demonstration of individual projects.
- e. Help provide necessary technical information that may be necessary to execute assigned projects. Identify a suitable Officer to function as immediate interface for project Coordination.
- f. Facilitate attachment of students /research scholars to the industry for study / data collection / vocational training.
- g. Help TCOE in working out desired deliverables on an annual basis.
- h. Endeavor to recruit students working in TCOE so as to make it an attractive proposition for them.
- i. Help Institute in commercialization of innovations and finding industry partners.

## **Role of DoT**

- a. Form a Coordinating Centre of TCOEs with public private participation, retaining private sector's dynamism for effective & efficient running and provide the needed infrastructure.
- b. Ensure that research takes place in all aspects of the telecom domain in various TCOE with minimal duplication.
- c. Create a VPN network connecting all TCOE for knowledge sharing.
- d. Help in obtaining necessary clearances from the Ministry of Finance for Tax exemptions under R&D funding. Further, help TCOEs in getting Income tax exemption.
- e. Help the centers to enter into international collaborations for knowledge sharing, international patenting and standardization activities.
- f. Organize healthy competitions amongst the TCOEs to improve quality of innovation and publish an Annual Telecom Journal.
- g. Nominate Government representatives to the TCOEs from time to time and ensure their active participation.
- h. Conduct governing body meetings under the chairmanship of Secretary, DoT at least once in a year.

## **Intellectual Property Rights (IPRs)**

The MoUs contain guidelines on sharing of IPRs generated as a result of work at TCOEs. The IPRs shall be jointly owned by the hosting institute(s), sponsor and DoT. A formula for sharing of revenues, generated as a result of commercialization of IPRs, among the inventor, the TCOE, the institute, DoT and the principal sponsor is also given.

## **Associate Sponsors**

TCOE initiative encourages wider participation from the industry. Apart from the principal industry sponsors, other organizations are welcome to join as Associate sponsors through signing of MoUs with the TCOE(s) of their choice. Associate sponsors shall have access to the knowledge generated by the TCOE but not a share in the IPR revenues.

## **Research, including Contract Research, at TCOEs**

The TCOEs shall work on real world technical / managerial / operational problems faced by the sponsors. The endeavour would be to work on both short term and long term projects. Apart from sponsors' problems, the TCOEs shall be free to take up Contract Research or other sponsored projects in order to generate revenues. The revenue generation aspect becomes important as the TCOEs are expected to ultimately become self-sustaining after initial years of funding by the sponsors and DoT.

### **Incubation and Entrepreneurship Development**

TCOEs shall have strong in-house incubation and entrepreneurship development programmes to realize the full commercial potential of the innovations, technologies and products coming out of the system. They have been promised fullest cooperation in this regard by the prominent industry associations of the country.