Response to

TRAI

Inputs for Formulation of National Telecom Policy - 2018

Contributed by

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1. Addition to Mission

- **To encourage investment, both by public and private sector, in telecom/ Internet facilities thereby contributing to robust Information and Communication Technology (ICT) infrastructure in the country**

Justification:

1. Despite the 25 of years of liberalization of the telecom sector in the country, the infrastructure (both access and backhaul) have not been upgraded to cope up with the traffic demand.
2. The Quality of Service levels of landline, cellular mobile and Internet services have been very poor, much below the International benchmarks.
3. This necessitates continued investment, both by public and private, Facility Based Operators (FBOs) below the Network Layer levels.

Associated Objective

- To improve the ICT infrastructure in the country to be ranked in the Top 25 in the World.

Associate Strategy

1. Reduce the regulatory levies on FBOs to the International levels of just about 3% of Adjusted Gross Revenue (AGR);
2. If the FBOs have spectrum, and since they acquire spectrum in Auctions, the Spectrum Usage Charge should be eliminated;
3. Since FBOs participate in the infrastructure development, the Universal Service Levy of 5% of AGR should also not be applicable.

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2. Addition to Mission

- **To migrate to Facility Based Operator (FBO) and Service Based Operator (SBO) model of licensing as is being practiced in most of the countries; and to implement Open Access regulation for the assets of FBOs**

Justification:

1. Though we have moved from individual licensing to Unified Access Service License to Unified License over a period of time, there is still no distinction at all between facility and non-facility based operators.
2. This leads to ambiguity in regulatory treatment and levy of regulatory fees.
3. This also leads to ambiguity in responsibility for the Quality of Service.
4. Mobile Network Operator license and Virtual Mobile Network Operator is a step towards this.

Associated Objective

- To migrate towards twin licensing regime: FBO and SBO license

Associate Strategy

1. Clearly lay down conditions for FBO and SBO;
2. Allow regulated entry of FBOs so that investment incentives are higher;
3. Reduce the entry and exit barriers to bare minimum for SBOs for a competitive market;
4. Implement **Open and Non-Discriminatory Access** to the facilities of the FBOs by the SBOs to prevent cartelization, collusions and vertical integration;
5. While FBOs should be tightly regulated, enable light touch regulation for SBOs;
6. Regulatory levies for FBOs should be minimal to encourage investment; on the other hand the SBOs should incur USL so that it can be used for infrastructure augmentation by the public FBOs;
7. Enable **co-investment** and **sharing of facility assets by FBOs** so that risk exposure of FBOs are minimized;
8. Lessons from the European Commission's Digital Agenda 2020 and Digital Economy papers and recommendations.

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3. Addition to Mission.

- Along with Open Access mission, create dynamic spectrum sharing infrastructure for optimal use of licensed spectrum across FBOs, SBOs and Government (http://www.financialexpress.com/archive/defence-must-vacate-spectrum-for-wireless-broadband/1289104/)

Justification:

1. Spectrum owned by the Government (e.g. Defence, Broadcasting) or Pubic Sector firms (e.g. GAIL, Power Grid, and Railways) is not optimally used across time and space;
2. In the U.S. and Europe with the deployment of Shared Spectrum Access and Licensed Shared Access, dynamic spectrum sharing infrastructure is being created and dynamic sharing across spectrum holders are being promoted, including Government spectrum;

Associate Strategy

1. Implement Geo-Location Spectrum database much like most of the EU member countries and US for easy access to which spectrum is being used at what time in which location; this project shall be taken up by WPC of DoT ;
2. Defense, Telecom and other ministries and departments shall work out the modus-operendi for sharing spectrum across time and space with FBOs or SBOs using this database;
3. Introduce "spectrum brokers" who can mediate for exchange of spectrum between interested parties.

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4. Addition to Mission.

- Build "**Software-driven telecom**" and leverage our core competency in Software Development (Please refer to http://www.financialexpress.com/opinion/india-can-

become-a-global-leader-in-telecom-solutions-not-just-stem-job-losses-but-even-reverse-it/965541/)

Justification:

1. On-going mega disruptions in the telecommunications industry due to software defined networks, cloud computing and data management models are driving the switch from hardware to virtualization of software;
2. Taking inspiration from the late Vanu Bose—the pioneer of software-defined radios—our telecom and IT industries should come together to address the needs of emerging "software-driven telecom" and build relevant competencies;
3. It is time to discard our "follow the leader" approach blindly and, instead, leverage our significant strengths to dominate the new world of software-driven telecom.

Associate Strategy

1. Build research labs in coordination with TSDSI and TCOEs for "software driven telecom", through appropriate academia and industry collaborations;
2. Create Technology Parks with suitable security and privacy infrastructure for firms (both small and large) to setup Global Telecom Management Centres for software driven telecom deployed globally.

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5. Addition to Section G.

- By delicensing some of the widely used Industry standard sub GHz bands (e.g. 800 MHz, 450 MHz) for long haul IoT and M2M communications

Justification:

1. Sub GHz hands are perfectly suitable for IoT and M2M communication as these devices and sensors might have to communicate over larger distances than covered by cellular networks;
2. The IoT and M2M communication require very low capacity and hence a very narrow band, if delicensed should be sufficient to cater to the traffic requirements in a specified area;
3. There are already countries in EU (868 MHz), the U.S. (915 MHz), and China have been deploying IoT and M2M services over unlicensed bands; there are industry alliances such as LORA (https://www.lora-alliance.org/) that already provide standards for deployment of IoT services in sub GHz band and hence be used as benchmark for deployment.

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6. Addition to Section G.

- To create business friendly processes for applying experimental licenses for development and testing of radio equipment and solutions, especially for India based Engineering R&D Services companies.

Justification:

1. The process of obtaining experimental licensing (both radiating and non-radiating) for development and testing of innovative new telecom products and services is very cumbersome, lengthy and time consuming;
2. The licenses are issued by Regional Licensing offices of WPC which are not empowered to make any decision regarding allocation of frequencies for experimental use; they depend on the WPC headquarters at Delhi for approvals; this is tedious and time consuming;
3. The experimental licenses for satellite testing is not given to private firms for development and testing; this prevents any global satellite company from outsourcing their development activities to an Indian firm;
4. The above creates a huge barrier for Indian Engineering & R&D firms to overcome to get contracts from global companies for new product development and testing.

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7. Addition to Section D.

- TRAI and DoT in partnerships with academic Institutes train officers in Government and Public operators on emerging technologies, telecommunications management, ICT regulation and policy;

Justification:

1. There is severe shortages of experts in telecommunications technology, techno-economics, management and regulation in our country, given the importance of the sector as backbone of digital economy;
2. Only when decision makers concerned are experts in their fields that they will be able to make correct decisions.

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8. Addition to Section E.

- Enable community based networks based on Wi-Fi to be developed that caters to the local broadband requirements, especially in rural and semi-urban areas of the country to achieve the required Internet penetration

Justification:

1. While we still struggle for licensed operators to invest in rural telecom infrastructure, it is time that we leverage the concept of Community Networks, very popular and widely used in Nordic countries such as Finland as a bottoms-up approach for providing Internet Connectivity through Public Wi-Fi hotspots;
2. With BharatNet providing the backbone up to Panchayat level, public Wi-Fi by local communities can definitely supplement and enhance broadband connectivity in the rural areas of the country.
