EXPORT STRATEGY

for

TELECOM EQUIPMENT

TEPC
Driving Telecom Export

TELECOM EQUIPMENT & SERVICES EXPORT PROMOTION COUNCIL

Gate No. 5, Khursid Lal Bhavan, Jan Path, New Delhi

Preface

TEPC, as an Export Promotion Council, plays a critical role in furtherance of export of Telecom Equipment and services from India and assists its member companies in facilitation of their respective exports. The Council caters to the complete Telecom Ecosystem including Telecom Hardware Manufacturers, Telecom Service Providers, Telecom Software Vendors and Consultants.

The price of any commodity depends on the economies of scale. Consequently, the export of telecom products cannot be seen in isolation as economies of scale cannot be achieved without domestic demand which can be leveraged by domestic companies to create innovative, high-quality products and solutions that not only meet the needs of the highly competitive Indian market, but also compete in the global market.

Considering the present scenario, the future technological developments and national & international projected demand of telecom equipment, there exists ample scope forlarge scale telecom equipment production to meet domestic demand and also be part of a global supply chain.This will need supportive policies and incentives extended to the Indian telecom equipment industry, the current Global situation provides a unique opportunity to the Indian Telecom Equipment Manufacturers which can be fully leveraged with prompt and imaginative policy initiatives under the Make in India initiatives. Telecom Equipments form part of critical and strategic infrastructure which will be reliable and secure and will facilitate march of technology in this sector and enablethe digitisation of our economy.

This document 'Export Strategy for Telecom Equipment & Services' deals with the present scenario, projections during the coming years, with a SWOT analysis of Indian telecom equipment sector, Short-Term, Medium-Term and Long-Term strategy which focuses on the various challenges faced by the Indian telecom manufacturing industry and action points thereof as well as sets the targets for the various indigenously designed, developed and manufactured Indian telecom equipment.

This document is the result of a massive effort by our Director-General with support from TEPC staff and our members. I take this opportunity to thank them all and I sincerely hope this document will galvanise the Telecom Equipment Sector to reach commanding heights.

Shyamal Ghosh
IAS (Rtd.)
Chairman, TEPC

Table of Contents

Executive Summary		**1**
Chapter-1: Introduction		
1.0	Telecom – A Key Driver of Development	**6**
1.1	National Digital Communication Policy 2018	**7**
1.2	Continuous Technological Advancement – The Soul of Telecom World	**8**
1.3	Economies of Scale – A Demand of Globalisation	**8**
1.4	International Scenario - A Never Before Opportunity	**8**
1.5	Security – A National Concern	**9**
1.6	TEPC - A Facilitator	**9**
Chapter-2: Telecom Sector – At a Glance		
2.0	Present Scenario & Projections	**10**
2.1	Indigenous Technology & Products Availability	**10**
2.1.1	Optical transmission and optical access	**10**
2.1.2	Wireless base-stations, radio and core equipment for 4G and 5G Networks	**10**
2.1.3	Ethernet Switches and Routers	**10**
2.1.4	Customer Premise equipment (CPE)	**10**
2.2	Telecom Products - Foreign Trade at a Glance	**10**
2.3	Domestic Telecom Network – A Glance	**11**
2.4	Plans of domestic telecom network	**12**
2.4.1	Broadband Initiatives	**13**
2.5	International Demand	**14**
2.5.1.	Mobile Subscriber Projections	**14**
2.5.2	Projections of 4G/ 5G/ Broadband/ Smart Phone Mobile Connections	**14**
2.5.3	GPON Market Trends	**16**
2.5.4	OLT & ONT Forecast	**16**
2.5.5	Optical Fibre Cable Market Trends	**18**
Chapter-3: Telecom Sector – SWOT at a Glance		
3.0	SWOT Analysis of Manufacturing of Telecom Equipment in India	**19**
Chapter-4: Targets Envisaged		
4.0	Delivering measureable, time-bound results	**21**
4.1	Short Term Goals (One-year Period)	**21**
4.2	Medium-Term Goals (1-3 Years Period)	**21**
4.3	Long-Term Goals (More Than 3 Years Period)	**21**

Chapter-5: Strategies for Export Promotion

5.0	Brief Background	22
5.1	Time Spans of Strategic Planning for Export Promotion	22
5.2	Short Term Strategies (One-year period)	23
5.2.1	Organising Stake Holders Events	23
5.2.2	Study of Various Policies & Suggestions to Government	23
5.2.3	Dissemination of Information to Stakeholders	23
5.2.4	Production Linked Incentives	23
5.2.5	Enforcement of PPP-MII policy	23
5.2.6	Strict Imposition of the Reciprocal Clause-10d of Preference to Make in India (PMI) Order of DPIIT	24
5.2.7	Implementation of the Mandatory Testing & Certification of Telecom Equipment (MTCTE)	24
5.2.8	Imposition of Stipulated Basic Custom Duty	24
5.2.9	Rationalisation of Custom Duty	25
5.2.10	Telecom Investment Summit	25
5.2.11	Over-due Payments from Government & Centre/ State Public Sector Enterprises	25
5.2.12	Incentives to Public Sector/ Private Enterprises for Execution of High Level Projects in Foreign Countries	26
5.2.13	Implementation of PPP-MII Policy in Projects under Line of Credit (LoC)/ Grant-in Aid from Government of India	26
5.2.14	Production of Electronic Components	28
5.2.15	Study of Chinese and Vietnam Models of Attracting Foreign Investments	28
5.2.16	Institutional Mechanism for Monitoring Telecom Equipment Manufacturing	28
5.2.17	Creation of Telecom Finance Corporation for incentivizing buying of indigenous products	29
5.2.18	Training to the Personnel of Purchasing Entities Importing the Indian Telecom Products	29
5.2.19	Action Regarding Non-Tariff Barriers	29
5.2.20	Earnest Money Deposit (EMD) & Performance Bank Guarantee (PBG)	30
5.3	Medium Term Strategies (1-3 Years period)	30
5.3.1	Stricter Enforcement of Anti-Dumping and Anti-Circumvention Rules	30
5.3.2	Support for Research & Development of Telecom Products	30
5.3.3	Incentive for Procurement of Indigenously Designed Products	32
5.3.4	Corpus for Export Promotion	32
5.3.5	Financial Support to Export Oriented Telecom Equipment Manufacturers	32
5.3.6	Rationalisation of Electricity & Water Supply Rates	33
5.3.7	Compensation for Higher Cost of Capital & Labour	33
5.3.8	Channelising the Investment in Telecom Manufacturing Sector	33

5.4 Long Term Strategies (More than 3 Years period) **33**

5.4.1 Indigenous Production of Electronic Components **33**

List of Tables

Table-1 Telecom Subscription Data as on 31st March, 2020 **13**

Table-2 Details of Export, Import & Trade Deficit of Telecom Equipment during Last Five Years **35**

Table-3 Details of Pending Payments with BSNL, Government Departments & CPSES/SPSEs **37**

List of Charts

Chart-1 Foreign Trade of Telecom Equipment **11**

Chart-2 Access Service Provider-wise Wireless Subscribers Market Shares (as on 31st March, 2020) **12**

Chart-3 Access Service Provider-wise Wireline Subscribers Market Shares (as on 31st March, 2020) **13**

Chart-4 New Mobile Subscribers Projections by 2025 **14**

Chart-5 5G Adoption by 2025 (In percentage of connections) **16**

Chart-6 GPON Projected Revenue **17**

Chart-7 OLT Shipments Projections **17**

Chart-8 ONT Shipments Projections **17**

Chart-9 Optical Fibre Cable Projections **18**

List of Figures

Figure-1 Mile Stone for Mobile Industry – A new decade begins as growth continues. **15**

List of Annexure

Annexure-1 Details of Export, Import & Trade Deficit of Telecom Equipment during Last Five Years **35**

Annexure-2 Details of Notification Issued by DGFT Regarding Telecom & IT Equipment **36**

Annexure-3 Details of Pending Payments with BSNL, Government Departments & CPSEs/ SPSEs **37**

Annexure-4 Extract of Clause-24.3, Chapter-4, CF Unified Service License Agreement **39**

Annexure-5 Proposal for Incentivising Telecom Service Providers for Purchasing Indigenously Designed, Developed & Manufactured Equipment **40**

Annexure-6 Non-Tariff Barriers Imposed by Various Countries **43**

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Executive Summary

1. Indian telecom market is the fastest growing in the world with the second largest subscriber base. The telecom is an intensive and rapid changing technology sector which entails rigorous & consistent Research & Development efforts. It is a challenge on one hand whereas it provides ample opportunities for the manufacturing sector.

2. The price of any commodity plays an important role in any market place, be it international or domestic; the price competitiveness depends on the economies of scale, as a result, the export of telecom products cannot be seen in isolation as economies of scale cannot be achieved without the domestic consumption of the product. The large domestic demand can be leveraged by domestic companies to create innovative, high-quality products and solutions that not only meet the needs of the highly competitive Indian market, but also address the global market. Considering the security of the nation and safety & security of persons, the deployment of indigenous telecom products in Indian telecom networks is indispensable.

3. TEPC plays an increasingly important role in helping the Government in formulation of appropriate policies, provide a formidable platform to its members for increasing their export's business by various promotional activities such as participation in international exhibitions, setting up of highly focused 'international B2B' meets in India & abroad and establishing trade links abroad etc.

4. As per an exhaustive industry-wide study by Synergia Foundation 90% of required optical transmission and access equipment are available, 80% and 60% of 4G and 5G required products and technologies respectively are available, 80% of Ethernet switches & routers and 90% of Customer Premises Equipment (CPE) are available. The remaining equipment can be developed over a period ranging from six months to two years period.

5. Our initial focus should be to create fully-secured products based on Indian design (hardware & software) and with full technology control within the country, by using COTS and programmable semiconductor chips. At a later stage, we can focus on creating our own semiconductor chips.

6. During last five years, though slow but consistent increasing trend has been there in export of telecom products i.e. from U.S.$ 1,579.9 million to U.S.$ 6031.7 million during the year 2015-16 and 2019-20 respectively. However, the import of telecom products has also increased from U.S.$ 16,119.47 to U.S.$ 18,623.53 million during the period from 2015-16 to 2018-19. However, import of telecom products was comparatively low during the year 2019-20 i.e. U.S.$ 14, 471.39 million; the factor of Covid-19 pandemic may also have contributed for the same. Barring the financial year 2017-18, the trade deficit has consistently been around U.S. $ 15,000 million each year except for the year 2019-20.

7. Domestic Telecom Market

7.1 As on March 31, 2020, the urban tele-density was 142.31% whereas the rural tele-density was as low as 58.79%. The National Digital Communication Policy envisages universal tele-density of 65 by the 2022. It also envisages 50 Mbps, '1 Gbps by 2020 & 10 Gbps by 2022', 100 mbps broadband to every citizen, Gram Panchyats and various institutions respectively. Under the same policy, Department of Telecom has planned various data connectivity through USOF and PPP model.

7.2 The major share of wireless subscribers, i.e. 89.36% of the total number of subscribers, are served by the private telecom service providers leaving only 10.64% of subscribers who are served by PSU telecom service providers. The PSU service providers, with the market share of 58.46%, dominate the wire-line subscriber market but their wire-line subscriber base has depleting trend; therefore, the expansion of their fixed line network is not envisaged except for the broadband connections.

7.3 Therefore, the domestic market for telecom products is dominated by the purchasers who are private service providers.

8. International Demand Projections:

8.1 As per report of the GSMA on 'Mobile Economy 2020', by the year 2025 the total new mobile subscriber addition, world over, have been projected to be more than 600 million out of which 247 million, i.e. the largest share, will be from the Asia-Pacific region. The second largest number of subscriber additions will be from Sub-Saharan Africa amounting to 142 million. By the year 2025, it has been predicted that the total number of 5G subscribers will be 1.8 billion and will overtake total number of 3G subscribers. Therefore, as far as mobile networks are concerned, there will be large demand of telecom products to be met.

8.2 Global PON market will be growing at a CAGR of 4.3% during the period 2020-25 and PON equipment revenue is forecasted to approach $8.4 billion in 2025. PON equipment revenue is expected to grow significantly as several operators continue investments in PON networks. PON equipment revenue is forecast to grow significantly in Europe, the Middle East, and Africa (EMEA), slightly exceeding $2.2 billion in 2025, representing a CAGR of 13.6% for the period 2018–25.

8.3 10G GPON OLT port shipments is beginning to ramp up in developed markets of Europe and America by late 2020. By 2021, the GPON OLT port shipments in Asia and Africa will shift towards 10G. The shift to 10G PON OLT ports is well underway in China, Japan, and South Korea and with some operators in Europe and North America (NA). The OLT & ONT shipment during the period 2020-25 are projected to be 10,000-11,000 and 1, 12,000-1, 34,000 respectively.

8.4 The demand of optical fibre cable is expected to increase gradually from 4678.4 Lakh fibre kilometres during the year 2020 to 6, 339.4 Lakh fibre kilometres during the year 2024. The same is in line with the world-over expansion of telecom networks and the FTTX facility. The target markets of optical fibre are developing Asia with 57.1% to 62.9% share out of total projected demand of optical fibre during 2020-24. Therefore, the endeavour shall be to concentrate on exploring the export potential of optical fibre cable in the developing Asia countries.

9. Considering the present scenario and the future technological developments and projected demand of the telecom equipment, there exist ample scopes for the telecom equipment production and also for the export. The support, by way of supportive policies, incentives extended to the Indian telecom industry, etc. will act as a catalyst for the purpose.

10. The strategy involving various activities, for promotion of export of telecom equipment, can be categorised into short, medium and long term spread over a period of one year, one to three years and more than three years respectively. Some of the activities, which are under short-term category, are repetitive in nature whereas the others require one-time measure.

11. Short Term Strategies (One-year period)

11.1 Due to the Covid-19 pandemic, spread all over the world, virtual events like Africa-Com, Mobile World Congress, India-Africa Telecom Expo, India-ASEAN Telecom Expo, India Telecom etc can be organised/ participated to promote the telecom products and build brand India image in the global market with the support of Department of Commerce & Department of Telecommunications schemes.

11.2 TEPC will Study various policies and interface with Govt. for policy concerns/ suggestions to promote export of telecom equipment gradually and steady. TEPC will Keep ICT stakeholders'/ exporters updated on latest developments in policy and Regulatory front including PMI, NDCP, 5G field trial, Budget Proposals etc. and will take up the issues faced by them with the appropriate authorities.

11.3 Production Linked Incentive Scheme is under consideration of Department of Telecommunications. The scheme will provide the thrust to the telecom manufacturing in the country, and therefore, shall be implemented on priority. The scheme must not limit itself to increased capital investment.

11.4 The PPP-MII policies shall be enforced strictly. The Department of Telecom, as a nodal

department must act swiftly and address any non-compliance in any tender involving telecom products.

11.5 The procurement agency should check with the nodal Ministry for names of such countries where the reciprocity clause 10d of PPP-MII Order of DPIIT should be applied. The strict compliance to the aforesaid list must be ensured by the purchasers.

11.6 Considering the security of the country and the security & safety of the users, it becomes indispensable to implement the Mandatory Testing & Certification for all the telecom equipment on immediate basis as telecom equipment are capable of routing or redirecting user data traffic, permitting visibility into user data or packet, causing network traffic to be disrupted remotely and the espionage & malafide nature of the countries such as Peoples Republic of China, hence, poses an "unacceptable risk". Therefore, Mandatory Testing & Certification of Telecom Equipment (MTCTE) shall be immediately implemented.

11.7 The category 'Others' included in the list of items under ITA-1 is ambiguous and can be exploited by the foreign manufacturers to import their items in India with applicable exemptions under ITA-1. Further, many equipment, which did not even exist at the time when India signed WTO ITA-1 agreement, are given the benefit of zero duty. Levying zero custom duty or less than the stipulated rate, on the import of the goods, defeats the very purpose of imposing it. Such practices badly impact the domestic industry and thereby even defeating the Make in India programme of Government of India. Therefore, levying the stipulated custom duty rate on the goods shall be ensured in order to safeguard the Indian domestic telecom industry. Further, an experts group should identify the telecom products, which are not covered under the provisions of ITA-1 and BCD to be imposed.

11.8 The custom duty is levied on import of certain electronic components. On the other hand, an equipment, in which such electronic components are integral part, is imported at zero BCD. The issue of import duty structure on 'components used in telecom equipment' and 'finished telecom equipment' needs to be reviewed in details to remove such anomalies as such BCD structure makes the Indian manufactured finished product costlier as compared to the imported finished telecom equipment/ products.

11.9 Telecom Investment Summit may be organised by the Department of Commerce and Department of Telecommunications considering the huge quantum of the investment requirement in telecom product manufacturing sector.

11.10 Overdue payments (amounting to Rs. 3, 098 crores approximately as on August 26, 2020) of domestic telecom products manufacturers from BSNL, Government departments and CPSEs/ SCPEs which are delayed shall be released on urgent basis as any further delay in the current situation is increasing the risk of survival of the domestic industry, which is already stressed, especially after the COVID-19 pandemic. Most of the companies, for whom payment is pending, are in MSME category and such an amount is substantial for such size of the enterprises; **such a huge pending payment creates a substantial stress on company's working capital needs and** may make them non-competitive vis-à-vis the Multi-National Companies (MNCs) enjoying the economies of scale.

11.11 To promote deployment of indigenous products in the telecom networks in friendly countries, capabilities of Indian System Integrators like TCIL, ITI and other private entities should be harnessed by extending suitable incentives.

11.12 Government of India extends Line of Credit/ Grant-in Aid to various countries under Indian Development & Economic Assistance Scheme (IDEAS). IDEAS guidelines were issued during the year 2015 when the Public Procurement (Preference to Make in India) policy issued by DPIIT didn't exist. During the implementation of LoC/ Grant-in Aid projects, certain issues have evolved after issue of latest IDEAS guidelines and PPP-MII orders. Therefore, for addressing various issues, IDEAS guidelines need to be revised; PPP-MII policy order of DPIIT and subsequent notification of DoT shall also be followed while procuring telecom equipment for LoC/ Grant-in-Aid projects.

11.13 The import of telecom products includes the import of Integrated Circuits (ICs) and discrete electronic components. The production of integrated circuits involves designing, fabricating the chips and packaging the same. Indian engineers have the talent of designing the integrated circuits. The fabrication of ICs involves huge capital investments. Therefore, to minimize the import of ICs and discrete electronic components, as a first step the multi-national companies, which are world leaders in manufacturing of ICs and discrete electronic components, may be invited for establishing their divisions for designing & packaging of ICs in India.

11.14 With a view to adapt suitable model for promoting manufacturing base in India, study of the commercial environment, policies and the Government support extended to telecom/ other equipment manufacturing companies by China and Vietnam is required. A study group needs to be constituted for the aforesaid study; the study group shall submit their report within a shortest stipulated time period.

11.15 In order to ensure the focussed attention of DoT on manufacturing of telecom equipment within the country, the progress of telecommunication equipment manufacturing in the country should be monitored in DoT at least at the level of Member, Digital Communications Commission. For a time bound progress, a dedicated unit in DoT should be made responsible for facilitation and monitoring of telecommunication equipment design, development, and manufacturing in the country.

11.16 On the lines of Indian Railway Finance Corporation and NHAI, Infrastructure Investment Trusts (InvIT), a Telecom Finance Corporation/ InvIT may be established, by the Government of India, for telecom sector for providing long term soft loans with certain moratorium period to the telecom service providers, equivalent to the vendor's credit extended by MNC telecom vendors, for buying the indigenous telecom equipment.

11.17 With the objective of providing additional support to the exporters of telecom equipment and boost to the export of Indian telecom equipment in ITEC countries, the training may be provided to the personnel of the foreign purchasing entities who import the Indian telecom products under Indian Technical and Economic Cooperation (ITEC) Programme of Ministry of External Affairs, Government of India.

11.18 Indian telecom manufacturers have reported non-tariff barriers imposed in number of countries, therefore, steps need to be taken to overcome such non-tariff barriers so as to enable the Indian telecom equipment manufacturers to export their equipment to such countries.

11.19 The Performance Bank Guarantee (PBG) & Earnest Money Deposit (EMD) is takne by CPSEs at the rate of 5-10% and 2-5% respectively. As a result very huge amount is locked up which is non-productive and sheer wastage of money. In present scenario of Covid-19 pandemic, the PBG and EMD may be reduced to 1-2% and 0.5-1% respectively. Alternatively point system may be adopted.

12. Medium Term Strategies (1-3 Years period)

12.1 Stricter enforcement of anti-dumping and anti-circumvention rules with regard to telecom product imports, as per various notifications/ Office Memorandum/ Orders issued by GoI from time to time, needs to be ensured.

12.2 The conversion ratio from research to filing of patent by academic institutions in India is very poor as compared to developed nations. There is, therefore, a need to encourage active participation of industry and academia in R&D. Support is required for the same from Government. The various steps to be taken includes revamping the C-DoT, setting-up more Research & Development institutions by Government of India, setting up the Institution under Public-Private-Partnership (PPP) Model, constituting multi-disciplinary Telecom Equipment Development Board (TEDB) etc.

12.3 Department of Telecommunications as Licensor, as per powers conferred from the Clause-24.3, Chapter-4 of the Unified Service License Agreement can mandate all the TSPs, including private service providers, for

Preferential Market Access for procurement of indigenously manufactured products, however, if for some binding reason DoT itself finds unable to enforce powers conferred from the Unified Service License Agreement, telecom service providers may be incentivised for procurement of domestically manufactured telecom equipment as per National Digital Communications Policy 2018. Either by invoking the aforesaid Unified Service License Agreement condition or incentivising the Telecom Service Providers for purchase of indigenously designed, developed & manufactured equipment, will pave the way for आत्म-निर्भर भारत in telecom sector.

12.4 The Indian Telecom Operators are reluctant in using the Indian telecom products due to predatory prices offered by the MNCs. Therefore, to encourage the Indian telecom operators for using the indigenously designed products incentive such as the low-cost long-term loans for purchasing the indigenously designed telecom products needs to be extended. A corpus, of sufficient amount, shall be created from the 'Universal Service Obligation Fund (USOF)' to serve the incentive portion of the interest on the debt used for purchasing the indigenously designed Indian telecom products.

12.5 It is important to invest in effective branding of Indian telecom products and solutions in international markets. A telecom export promotion fund should be set up for this purpose; for market development, grant-in-aid, marketing subsidy for participating in global trade shows, both physical & virtual, and business development etc.

12.6 Availability of capital, soft-loans, contract financing, credit default insurance etc. are important for promoting the productivity of existing units and promoting the manufacturing in the telecom equipment sector. India has in place ECGC Ltd., a Government of India enterprise, with similar objectives but probably the level of support it extends to the telecom equipment manufacturers may not be the same as Chinese companies get in their country. DoT should coordinate with Ministry of Finance for making available the financing options, such as Venture capital in the form of equity & soft loans, Project finance, Contract financing options, Credit default insurance etc.

12.7 The industrial electricity and water supply charges are higher than the normal rates. For strengthening the industry financially and making the cost of production competitive, the electricity & water supply rates, for the industry, should be rationalised.

12.8 The cost of Capital, Power and Infrastructure is higher by 13-15%, in India, in comparison with the developed countries. In order to be competitive in the domestic as well as international market places, the cost disadvantage in respect of capital & labour needs to be compensated through sector specific financial incentives.

12.9 The investment from the big Indian industrial giants like L&T, Tata, Birla, Adani, Mahindra, Reliance etc., who had shown their inclination/ signed an agreement during the telecom investment summit for investing in telecom equipment manufacturing sector will be channelised to broaden the manufacturing base in the country.

13. Long Term Strategies (More than 3 Years period)

13.1 The long-term strategy for the manufacturing of telecom products and export promotion shall be to achieve the target of our honourable Prime Minister viz. आत्म-निर्भर भारत i.e. to achieve level of zero import of all telecom products (CKD, SKD and even the discrete components) and large quantum of export leading to the positive trade balance in telecom sector products and services.

13.2 The Multi-National Companies may be encouraged & motivated to set-up complete manufacturing base for manufacturing of ICs and discrete electronic component in India including their fabrication. The Indian giant companies may also be invited for setting-up the designing, fabricating and packaging of Integrated Circuits and other electronic components in India.

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Chapter-1: Introduction

1.0 Telecom – A Key Driver of Development:

The infrastructure is a critical-asset of any country as it is a key growth enabler. Telecommunication has emerged as a key driver of economic and social development in an increasingly knowledge intensive global scenario, in which India needs to play a leadership role. The Telecommunication sector plays an increasingly important role in the growth of any economy. Telecom sector contributes to the economic growth and GDP in addition to generating employment opportunities to the vast number of people. Therefore, telecom sector has multiplier impact on the economy. Telecom networks are mission-critical elements for secure and timely communications. It is the delivery vehicle for a large number of IT and IT-enabled services including healthcare, education, financial services, e-governance etc. both to the urban as well as rural masses. In a pandemic situation of Covid-19, it has gained utmost importance as various activities have shifted from physical to virtual.

Investment in Infrastructure is necessary for growth; to achieve the GDP of $5 trillion by 2024-25, India needs to spend about $1.4 trillion[1] (100 lakh crore) over these years on infrastructure. The Finance Minister released the Report of the Task Force on 'National Infrastructure Pipeline' (abridged version) on 31.12.2019. The NIP has projected total infrastructure investment of Rs. 102 lakh crores during financial year 2020 to 2025 in India; the telecom sector investment, in NIP projects, will be Rs. 3, 20,498 Crores.

Indian telecom market is the fastest growing in the world with the second largest subscriber base. Rapid growth of the sector has fueled the demand for telecom equipment. This large domestic demand can be leveraged by domestic companies to create innovative, high-quality products and solutions that not only meet the needs of the highly competitive Indian market, but also address the global market.

In the past, when we built our 2G, 3G and even 4G networks, we missed the opportunity to nurture and create our own domestic telecom equipment industry. As a result, over the last 15 years, we imported over US$ 100 Billion worth of telecom equipment. The Economic Survey 2020[1] stipulates that ***"India must focus on a group of industries, referred to as "network products", where production processes are globally fragmented and controlled by leading Multi-National Enterprises (MNEs) within their "producer driven" global production networks. Examples of network products include computers, electronic and electrical equipment, telecommunication equipment, road vehicles ……."***

The world's total export of Telecommunication and sound recording equipment is U.S. $ 0.65 trillion out of which India's share[1] is only 3.42%. As per Economic Survey 2019-20, the two sub-categories where India can achieve significant export growth are 'Office machines and automatic data processing machines (SITC 75)' and 'Telecommunication and sound recording equipment (SITC 76)'. Indian manufacturers can make significant strides in exports of telecom products to several countries especially in emerging markets if they produce telecom products of world-class quality which are globally competitive on technology and price. Having a large, young, skilled manpower is our another strengths. Various flagship programmes of the Government of India like Make in India, Digital India & Skilling India, National Infrastructure Pipeline etc. will further help this cause.

The design, development and manufacturing of its own telecom equipment are a big opportunity for India, creating huge value as well as large employment. As reflected in large amount of

[1] https://www.indiabudget.gov.in/economicsurvey/

telecom design and development work that is carried out in India for multinational companies, India has the design capabilities. Setting up of indigenous Chip set and basic components manufacturing capacity in the country needs full support and encouragement by all concerned.

A thriving telecom manufacturing industry right from R&D down to basic component levels would have a large positive impact on many other elements of the manufacturing value chain. This will also provide employment, increased share of manufacturing in GDP and export of equipment and services. Moreover, technical knowledge and IPR creation will also have spill over effects for other industries. India has missed having stake in technology standardisation, development and commercialisation so far and a couple of more years of apathy would seal the fate of telecom manufacturing in the country forever.

There are reasons for the Indian Manufacturing Industry not being able to meet the demand through domestic equipment manufacture. It includes lack of basic research to IPR generation, product design and development, product commercialisation and achieving economies of scales so that the product can compete with the imported one. Manufacturing needs support of other components of the value chain to flourish. Manufacture of components and sub-assemblies in India would help both the Indian product companies and Indian manufactured product companies. Large global EMS vendors need to be encouraged to set-up competitive large scale operations in India. This would not only reduce the input cost but also enable the same infrastructure to be used across the entire electronics sector. Smaller domestic players face the problem of not having economies of scale and availability of long term financing at low interest rates. R&D facilities, access to low cost funds and testing & certification are other areas which need to be strengthened to make the manufacturing environment more conducive. Several measures need to be taken to increase domestic production and enhance the progressive value addition to the products being manufactured in the country. A robust telecom network needs a strong telecom manufacturing base which will in turn contribute handsomely to the GDP and employment in the country. There is, therefore, a need to give the country a definite direction and to facilitate it to evolve as a strong telecom manufacturing hub. In the past, we have not been able to leverage our market opportunity and Indian Total Addressable Market size (TAM) for spurring indigenous manufacturing.

1.1 National Digital Communications Policy 2018:

The National Digital Communications Policy, 2018 (NDCP 2018) seeks to unlock the transformative power of digital communications networks - to achieve the goal of digital empowerment and improved well-being of the people of India; and towards this end, attempts to outline a set of goals, initiatives, strategies and intended policy outcomes.

The National Digital Communications Policy aims to accomplish the following Strategic Objectives by 2022:

a. Provisioning of Broadband for All.

b. Creating 4 Million additional jobs in the Digital Communication sector.

c. Enhancing the contribution of the Digital Communications sector to 8% of India's GDP from 6% in 2017.

d. Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017.

e. Enhancing India's contribution to Global Value Chains.

f. Ensuring Digital Sovereignty.

In pursuit of accomplishing these objectives by year 2022, the National Digital Communications Policy, 2018 envisages 'One Mission **Propel India**: Enabling Next Generation Technologies and Services through Investments, Innovation and IPR generation relevant for India to become a leader in cutting edge, state of the art technologies through R&D and creation and incorporation of Indian IPRs in global standards'. This will require measures for boosting entrepreneurship and creating a

major global manufacturing hub for telecommunication equipment to achieve self-sufficiency while squarely addressing security and strategic concerns. A concerted effort to boost manufacturing activity is now exigent as robust economic growth in the country is leading to an extraordinarily high demand for electronic products in general and telecom products in particular.

NDCP 2018 has defined Strategies for Ensuring a holistic and harmonised approach for harnessing Emerging Technologies including Research and Development, Promoting Start-ups and SMEs and Local Manufacturing and Value Addition. Thus, NDCP 2018 has clearly outlined vision, mission and strategies for making India a technology developer (creation of IPRs), contribution in global standardisation, development of home-grown products and telecom equipment manufacturing hub. Implementation of NDCP 2018 recommendations will translate into making India a net exporters of telecom equipment and services.

1.2 Continuous Technological Advancement – The Soul of Telecom World: Telecom is not only technology intensive sector but at the same time the technology develops at a very fast pace. Therefore, continuous rigorous efforts are indispensable to upgrade the products and services which entails focused research & development activities. Invariably, world over such research & development are supported by the concerned Governments be it China, United States of America or Europe. Centre for Development of Telematics (C-DoT) was established for the purpose, however, considering quantum of the requisite developmental work the efforts are insignificant.

India spent[2] 0.7% of its GDP on R&D in 2017-18, while the same among other developing BRICS countries was Brazil 1.3%, Russian Federation 1.1%, China 2.1% and South Africa 0.8%. Most of the developed countries spent more than 2% of their Gross Domestic Product (GDP) on R&D. Therefore, India needs to review the research & development policy specifically in the technology intensive sectors such as telecommunication.

1.3 Economies of Scale – A Demand of Globalisation: In international market-place, the Indian products have to compete with the products of Multi-National Companies (MNCs) including Chinese companies i.e. Huawei & ZTE, specifically price-wise. For price of the product to be competitive, the economies of scale is the key factor. As a result, the export of telecom products cannot be seen in isolation as economies of scale cannot be achieved without the domestic consumption of the product. Though the Indigenous products get preference in public purchases under PPP-MII orders of Govt. of India but due to predatory pricing quoted by the MNCs, Indian manufacturers are not able to compete for the products purchased by the private telecom service providers. Consequently, the Indian manufacturers are unable to achieve economies of scale and the dimension needs to be addressed for promotion of export of telecom equipment & services. In addition, the trust shown by Indian service providers, in the indigenous products, will prove to be benchmark in international telecom market-place.

1.4 International Scenario - A Never Before Opportunity: Due to trade war between United States of America and Peoples Republic of China and also international sentiments against the world-over spread of Covid-19 virus from China and taking the shape of pandemic, the companies having manufacturing plants in China are considering to shift the same elsewhere. Such companies need permanent measures to avoid the risk of tariffs and be eligible for U.S. government procurement. However, large number of such companies have shifted/ are shifting to Vietnam[3] whereas India

[2] https://dst.gov.in/sites/default/files/R%26D%20Statistics%20at%20a%20Glance%202019-20.pdf

[3] https://www.indiatoday.in/business/story/covid-spillover-firms-shifting-from-china-to-vietnam-has-lesson-for-india-1687344-2020-06-10

may also be a strong contender if the industrial investment environment proves to be congenial to them. Further, it shall be our endeavour that such companies not only establish their assembly line in India but to have product design, development, production and testing facilities also in India.

1.5 Security – A National Concern: Strengthening the research & development, designing, production and supply chain of the telecom product is not only a commercial activity but is also related to the security of any country. The telecom equipment are capable of routing or redirecting user data traffic, permitting visibility into user data or packets, causing network traffic to be disrupted remotely. As a result, poses an "unacceptable risk" to the national security and the security & safety of persons. Telecom networks globally, irrespective of whether they are owned by the private sector or government entities, intersect and communicate with each other. This is the reason why countries like U.S have been persuading large private telecommunication companies to stop using products from certain countries perceived to be threats to national security[4]. As per the Data Breach Investigations Report[5], several incidents of data breach due to embedded malicious hardware and software have been reported in the recent past. Therefore, it is need of the hour to have indigenously designed, developed and produced telecom products in our telecom network irrespective of type of ownership viz. public or private.

1.6 TEPC - A Facilitator: TEPC plays an increasingly important role in helping the Government in formulation of appropriate policies by making recommendations on strengthening domestic product development & manufacturing and creation of an environment conducive for increasing exports of telecom equipment & services. TEPC strives to provide a formidable platform to its members for increasing their exports business by various promotional activities such as participation in international exhibitions, setting up of highly focused 'international B2B' meets in India & abroad and establishing trade links abroad. It also uses the resources of Indian embassies abroad more effectively.

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[4] https://intelligence.house.gov/sites/intelligence.house.gov/files/documents/huaweizte%20investigative%20report%20(final).pdf

[5] https://www.verizonenterprise.com/resources/reports/2017_dbir_en_xg.pdf

Chapter-2: Telecom Sector – At a Glance

2.0 Present Scenario & Projections

2.1 Indigenous Technology & Products Availability: An estimate on the R&D capabilities available within the country, for each of the core telecom technology areas was recently done in an exhaustive industry-wide study and was reported by Synergia Foundation. These core technology areas, and the level of domestic capabilities and products that are available, are listed as under (the smart phones have not been included in the list, since the focus is on core telecom equipment):

2.1.1 Optical transmission and optical access: 90% of the required products and technologies are available. The rest can be developed within a period of six to nine months.

2.1.2 Wireless base-stations, radio and core equipment for 4G and 5G Networks:

a. **For 4G:** Eighty percent of the required products and technologies are available and the remaining products can be developed within twelve months.

b. **For 5G:** Sixty-five percent of the required products and technologies are already available. The remaining products can be developed within a period of two years.

2.1.3 Ethernet Switches and Routers: Eighty percent of the required products and technologies are available. Within one year, the remaining products can be developed.

2.1.4 Customer Premise equipment (CPE): Ninety percent of the required products and technologies are available as on date and the remaining can be developed within 6-9 months.

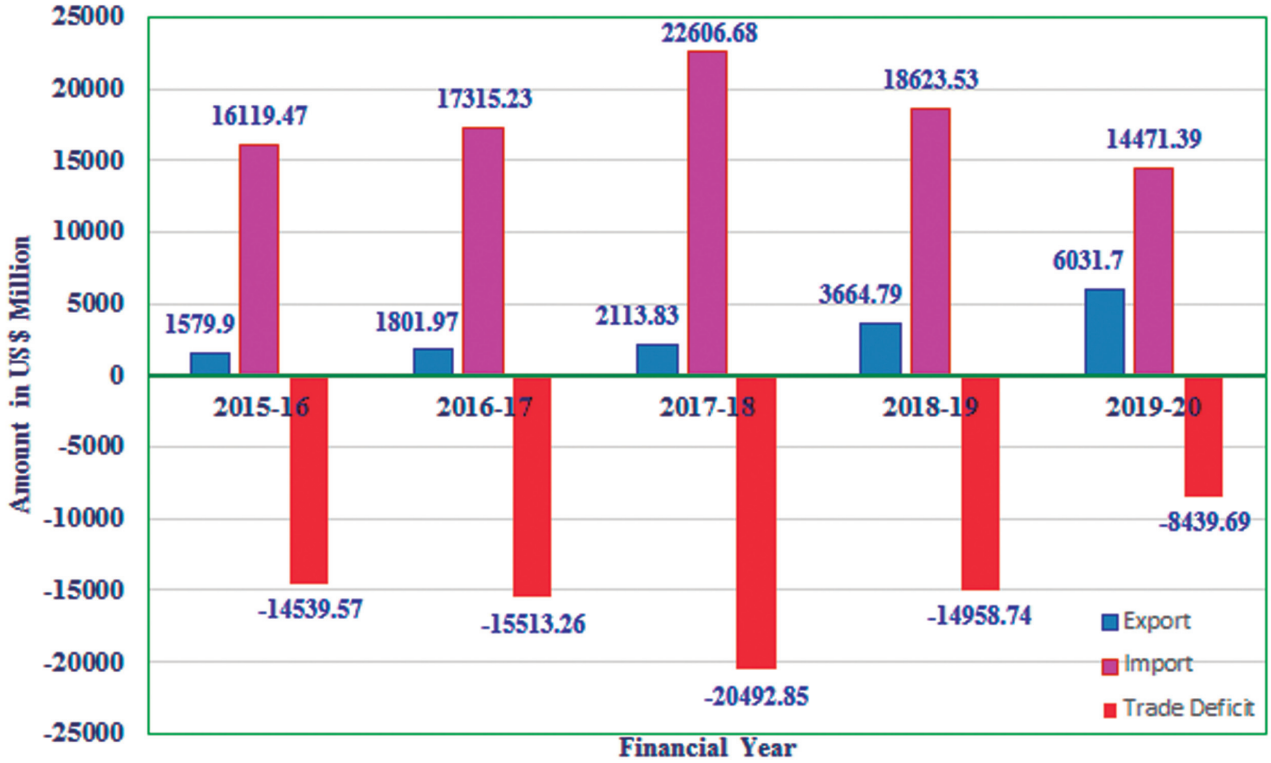
Our initial focus should be to create fully-secured products based on Indian design (hardware and software) and with full technology control within the country, by using COTS and programmable semiconductor chips. At a later stage, we can focus on creating our own semiconductor chips.

Inspite of the referred outcome of the study conducted by Synergia Foundation, it needs to be considered that the technology, in telecom sector, is not stand still but ever changing and it changes at a very fast rate. Consequently, consistent and focused efforts are required not only for keeping pace with the world-wide technological developments but also have to be product innovators to gain first mover advantage to have competitive edge over the international competitors.

2.2 Telecom Products - Foreign Trade at a Glance: The export, import and the trade deficit of telecom products, for last five years, are tabulated in Annexure-1 and depicted in Chart-1.

It is evident that though slow but there has been consistent increasing trend in export of telecom products i.e. from U.S.$ 1,579.9 million to U.S.$ 6031.7 million during the year 2015-16 and 2019-20 respectively; the export of telecom products has been U.S.$ 6031.7 million during the year 2019-20, inspite of the turmoil in the telecom sector due to spread of Covid-19 pandemic during the fag end of the financial year. However, the import of telecom products has also increased from U.S.$ 16,119.47 to U.S.$ 18,623.53 million during the period from 2015-16 to 2018-19. However, import of telecom products was comparatively low during the year 2019-20 i.e. U.S.$ 14, 471.39 million; the factor of Covid-19 pandemic may also have contributed for the same.

Chart-1: Foreign Trade of Telecom Equipment



The import of telecom products, during the year 2017-18, has shown some spurt which happened due to large quantity import of populated, loaded or stuffed printed circuit boards. It is observed that barring the financial year 2017-18, the trade deficit has consistently been around U.S.$ 15,000 million each year except for the year 2019-20.

2.3 Domestic Telecom Network – A Glance:

The details of telecom subscription data, as on March 31, 2020, issued by TRAI[6] is given in table-1. It may be seen that with the total telephone subscribers of 1,177.97 million and overall tele-density of 87.37%, the rural tele-density in India is still as low as 58.79% which

Particular	Wireless	Wire-line	Total
Total Telephone Subscribers (Million)	1157.75	20.22	1177.97
Urban Telephone Subscribers (Million)	638.48	17.97	656.46
Rural Telephone Subscribers (Million)	519.27	2.24	521.51
Urban Tele-density*(%)	138.41%	3.90%	142.31%
Rural Tele-density*(%)	58.54%	0.25%	58.79%
Overall Tele-density*(%)	85.87%	1.50%	87.37%
Broadband Subscribers (Million)	668.26	19.18	687.44
Source: Press release No. 49/2020 of Telecom Regulatory Authority of India			
Table-1: Telecom Subscription Data as on 31st March, 2020			

[6] https://www.trai.gov.in/sites/default/files/PR_No.49of2020_1.pdf

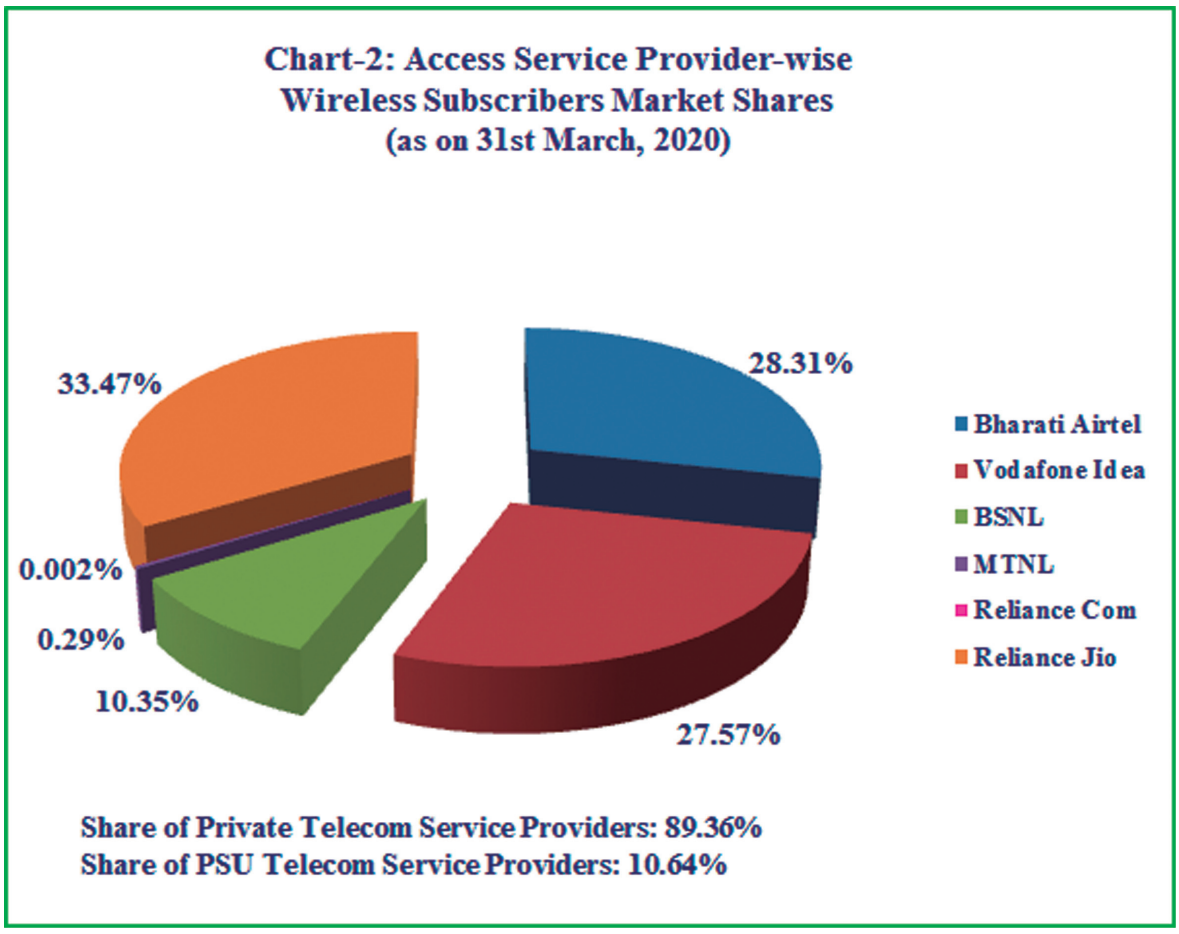
reveals that there is vast scope of expansion of telephone service in rural area.

As regards wireless subscribers, Chart-2 depicts that the major share of subscribers, i.e. 89.36% of the total number of subscribers[7], are served by the private telecom service providers leaving only 10.64% of subscribers who are served by PSU telecom service providers. Therefore, the domestic market for telecom products, in respect of wireless networks, is dominated by the purchasers who are private service providers.

Chart-3 encompasses the access service provider-wise market shares of wire-line Subscribers[7] as on March 31, 2020. Though the PSU service providers, with the market share of 58.46%, dominate the wire-line subscriber market but their wire-line subscriber base has depleting trend; therefore, the expansion of their fixed line network is not envisaged except for the broadband connections.

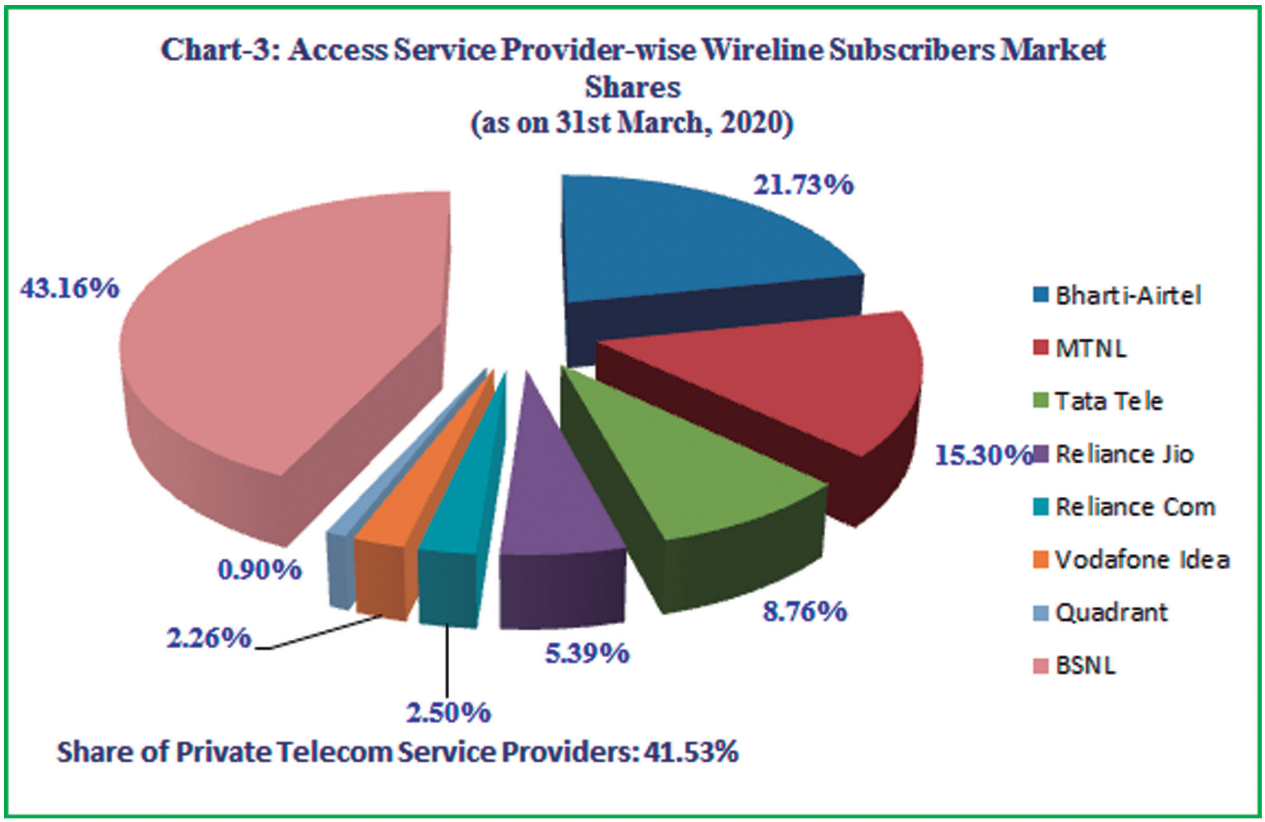
2.4 Plans of domestic telecom network

The domestic demand of telecom equipment is driven by the goals set by Department of Telecommunications vide 'National Digital Communication Policy 2018'. The goals defined in the said policy, targeted to be achieved by the year 2022, are as under:



Source: Press release No. 49/2020 of Telecom Regulatory Authority of India

[7] https://www.trai.gov.in/sites/default/files/PR_No.49of2020_0.pdf



Source: Source: Press release No. 49/2020 of Telecom Regulatory Authority of India.

a. Provide Universal broadband connectivity at 50 Mbps to every citizen.

b. Provide 1 Gbps connectivity to all Gram Panchayats of India by 2020 and 10 Gbps by 2022.

c. Enable 100 Mbps broadband on demand to all key development institutions; including all educational institutions.

d. Enable fixed line broadband access to 50% of households.

e. Achieve 'unique mobile subscriber density' of 55 by 2020 and 65 by 2022.

f. Enable deployment of public Wi-Fi Hotspots; to reach 5 million by 2020 and 10 million by 2022.

g. Ensure connectivity to all uncovered areas.

2.4.1 Broadband Initiatives: As per National Digital Communication Policy 2018[8], to achieve the universal broadband access, Department of Telecommunications, through USOF and Public Private Partnership, planned the initiatives such as Bharat Net (Providing 1 Gbps to Gram Panchayats upgradeable to 10 Gbps), GramNet (Connecting all key rural development institutions with 10 Mbps upgradeable to 100 Mbps), NagarNet (Establishing 1 Million public Wi-Fi Hotspots in urban areas), Jan WiFi (Establishing 2 Million Wi-Fi Hotspots in rural areas). The scope of BharatNet has recently been expanded beyond Gram Panchayats to cover each of the 600,000+ villages in the country within the next 1000 days (by 2023). Further, DoT has envisaged implementation of a 'Fibre First Initiative' to take fibre to the home, to enterprises and to key development institutions in Tier I, II and III towns and to rural clusters.

The above said universal broadband access initiatives are envisaged to generate sufficient demand for the telecom equipment which will provide an impetus to the domestic telecom

[8] https://dot.gov.in/sites/default/files/Final%20NDCP-2018_0.pdf

industry if the Public Procurement (Preference to Make in India) policy is applied scrupulously by the purchasing authorities.

The Ministry of Communications has launched 'National Broadband Mission' that will facilitate universal and equitable access to broadband services across the country, especially in rural and remote areas.

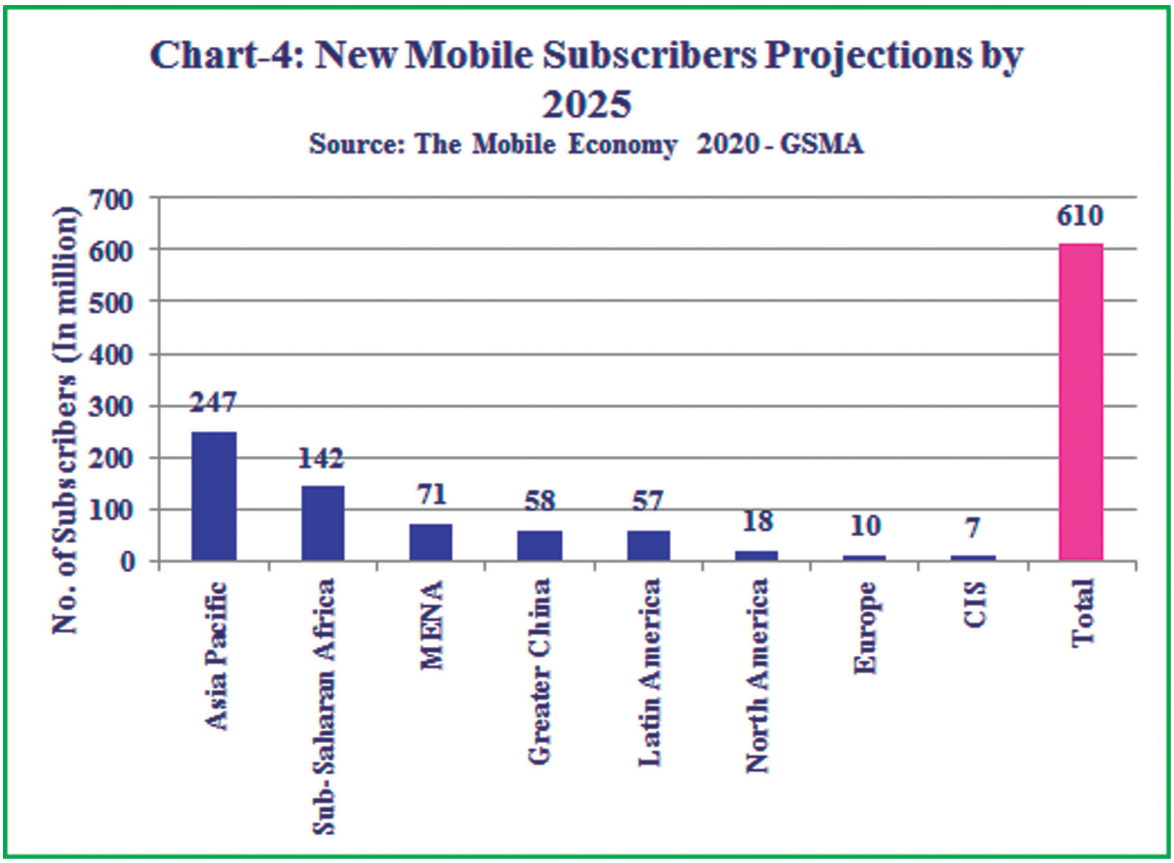
The Mission is part of the National Digital Communications Policy, 2018.

The vision of the Mission is to fast-track growth of digital communications infrastructure, bridge the digital divide, facilitate digital empowerment & inclusion and provide affordable and universal access of broadband for all.

The mission aims to offer broadband for all by 2022 including remotely-located hospitals, schools and post offices.

2.5 International Demand

2.5.1 Mobile Subscriber Projections: As per report of the GSMA on Mobile Economy 2020[9], by the year 2025 the total new mobile subscriber addition, world over, have been projected to be more than 600 million of which 247 million, i.e. the largest share, will be from the Asia-Pacific region. The second largest number of subscriber additions will be from Sub-Saharan Africa amounting to 142 million. The details of the all the regions are depicted in the chart-4.



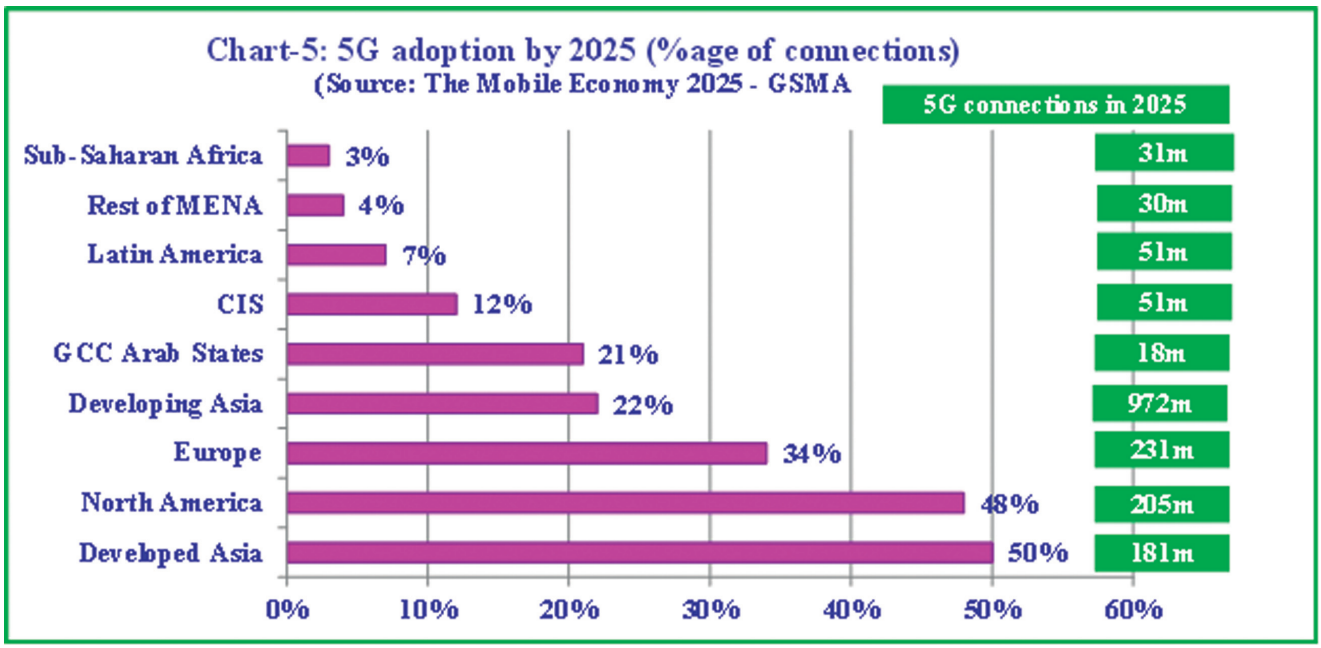
2.5.2 Projections of 4G/ 5G/ Broadband/ Smart Phone Mobile Connections: The consolidated projections for the number of subscribers, mobile Internet subscribers, number of connections, number of 4G connections, 5G connections, mobile broadband (MBB) and smart phone connections, as per GSMA[9] for the period from 2019 to 2025 are given in figure-1. By the year 2025, it has been predicted that the total number of 5G subscribers will be 1.8 billion and will will overtake total number of 3G subscribers.

[9] https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Global.pdf

	2019	2020	2021	2022	2023	2024	2025
subscribers	Two thirds of global population subscribe to mobile **services**			5.5 billion **subscribers**			70% of population subscribes to mobile services
Mobile Internet Subscribers		4 billion mobile Internet subscribers Half of the population using mobile Internet					5 billion mobile Internet subscribers 60% population using mobile Internet
Connections		8 billion mobile connections			8.5 billion mobile connections		
4G Connections	4 billion 4G connections 4G accounts for over 50% of total connections				4G peaks of just under 60 % of total connections	5 billion 4G connections	
5G Connections					1 billion 5G connections 5G overtakes 2G		1.8 billion 5G connections 5G overtakes 3G
Mobile Broadband (MBB)			MBB accounts for over 85% of total connections				MBB accounts for 95% of total connections
Smartphone Connections	5.2 billion smartphone connections 65% smartphone adoption			75% smartphone adoption			7.1 billion smartphone connections 80% smartphone adoption

Figure-1: Mile Stone for Mobile Industry – A new decade begins as growth continues.
Source: The Mobile Economy 2020 published by GSMA[9]

The region-wise projections of the 5G subscribers, 1.81 billions in total, are given in chart-5. Therefore, it is evident that as far as mobile networks are concerned, there will be large demand of telecom products to be met.



2.5.3 GPON Market Trends: Global PON market will grow at a CAGR of 4.3% during the period 2020-2025 (Source: Ovum). The annual global revenue forecast, from the GPON, are shown in chart-6. At the global level, PON equipment revenue is forecast to approach $8.4 billion in 2025. This market remains in an upswing as operators continue to expand and upgrade their fibre-based access networks for both residential and non-residential subscribers and applications.

In North America, tier-1 operators are expected to invest more heavily in PON in the later forecast years than in the earlier forecast years given current focus on 5G network builds. In Asia and Oceania, PON equipment revenue will continue to grow as numerous operators expand and upgrade their respective networks. Operators will begin to use their respective PON networks to support non-residential subscribers and applications such as enterprises and smart cities. In Latin America and the Caribbean regions, PON equipment revenue is expected to grow significantly as several operators continue investments in PON networks. PON equipment revenue is forecast to grow significantly in Europe, the Middle East, and Africa (EMEA), slightly exceeding $2.2bn in 2025, representing a CAGR of 13.6% for 2018–25.

2.5.4 OLT & ONT Forecast: The forecast of OLT and ONT for the GPON, for the period 2020-25, are given in chart-7 & 8 respectively. 10G GPON OLT port shipments is beginning to ramp up in developed markets of Europe and America by late 2020. By 2021, the GPON OLT port shipments in Asia and Africa will shift towards 10G. The shift to 10G PON OLT ports is well underway in China, Japan, South Korea and with some operators in Europe and NA (North America). ONT/ONU upgrades will lag network upgrades but will represent more than 50% of forecasted units in 2024. NG-PON2 revenue is forecast to remain small during the forecast period.

It may be seen that the GPON market has lot of opportunities for Indian GPON manufacturers to carve out their respective niche.

Chart-6: GPON Projected Revenue

(Source: OVUM)

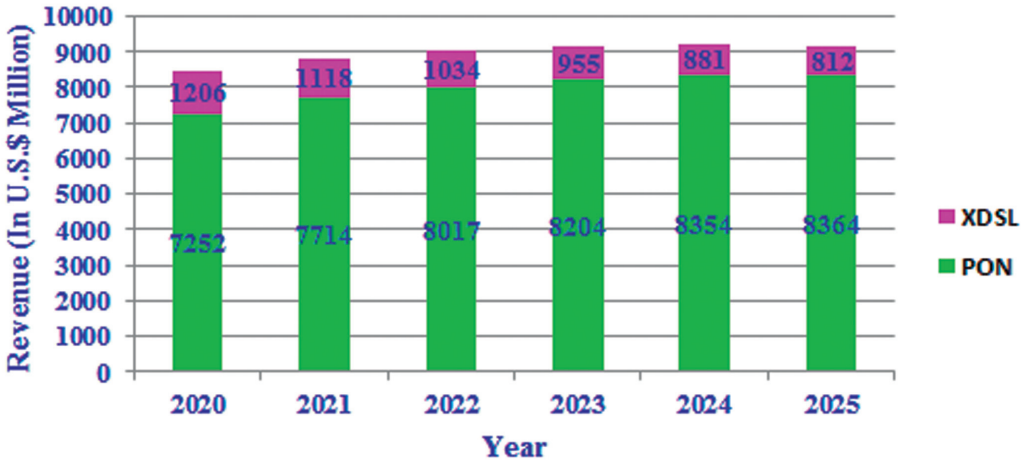


Chart-7: OLT Shipments Projections

(Source: OVUM)

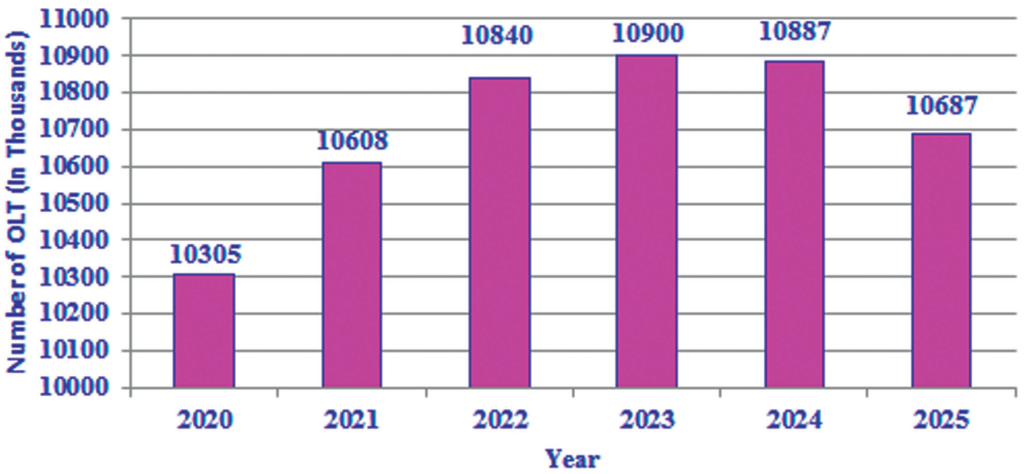
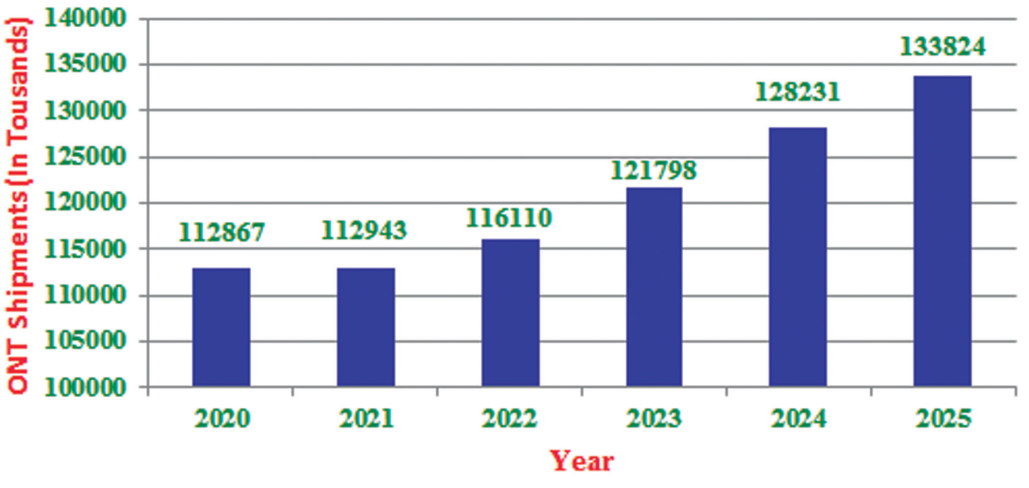


Chart-8: ONT Shipments Projections

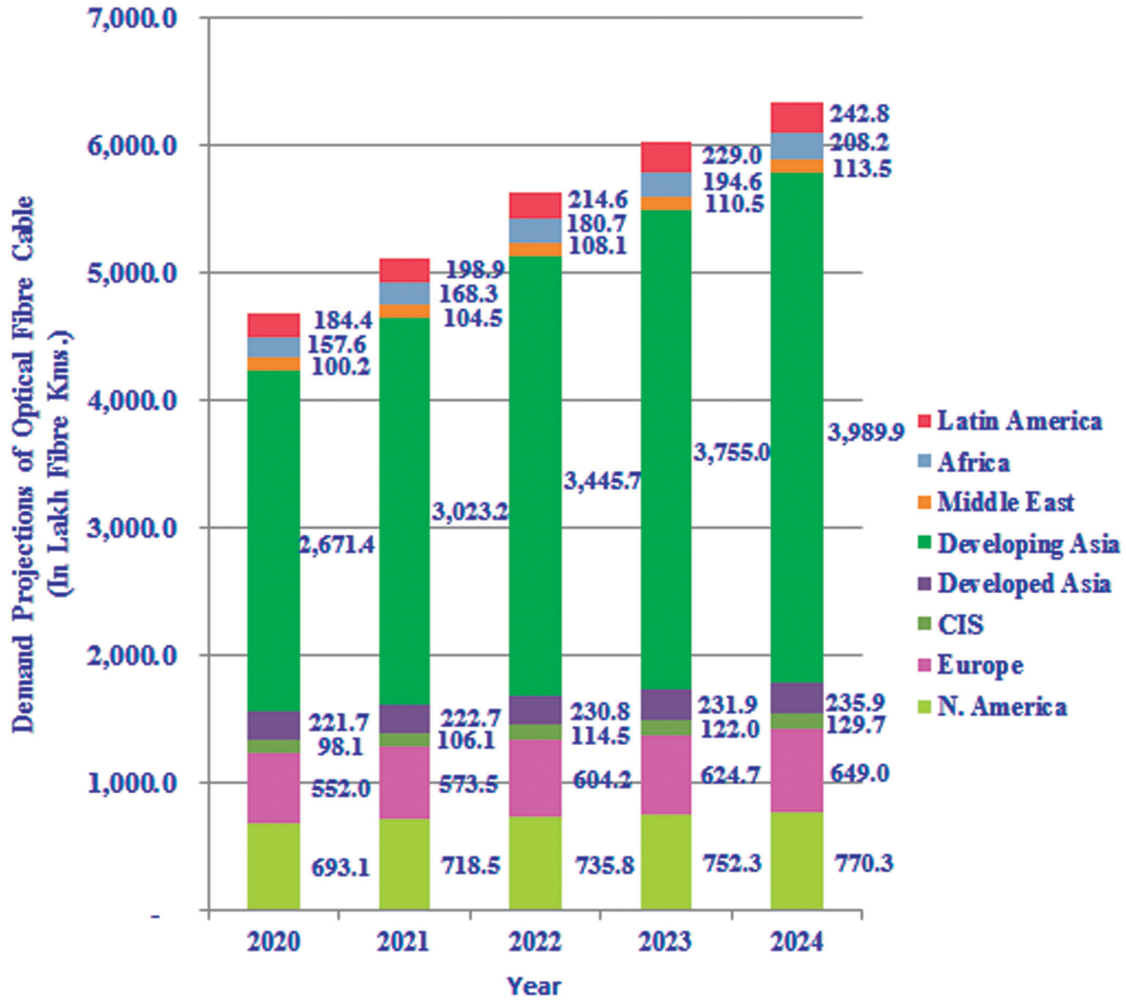
(Source: OVUM)



2.5.5 Optical Fibre Cable Market Trends: The chart-9 shows the projected demand of optical fibre for the period 2020 to 2024. The demand of optical fibre is expected to increase gradually from 4678.4 Lakh fibre kilometres during the year 2020 to 6, 339.4 Lakh fibre kilometres during the year 2024.

The same is in line with the world-over expansion of telecom networks and the FTTX facility. It may be seen that the target markets of optical fibre are developing Asia and North America. Developing Asia itself will have 57.1% to 62.9% of the total projected demand of optical fibre cable, world over, during 2020-24. Therefore, the endeavour shall be to concentrate on exploring the export potential of optical fibre cable in the developing Asian countries.

Chart-9: Optical Fibre Cable Projections (In Lakh Fibre Kms)
Source: Commodity Research Unit (CRU)



Considering the present scenario and the future technological developments and projected demand of the telecom equipment, there exist ample scopes for the telecom equipment production and also for the export. The support, by way of supportive policies and in terms of incentives, extended to the Indian telecom industry, will act as a catalyst for the purpose.

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Chapter-3: Telecom Sector – SWOT at a Glance

3.0 SWOT Analysis of Manufacturing of Telecom Equipment in India:

Indian local telecom manufacturing industry, over the past, has not been growing at a pace required to support the service providers as well as the consumers inspite of several initiatives taken by both i.e. the government as well as the industry. Therefore, it is imperative to conduct the SWOT analysis for finding the ground level situation/ circumstances.

Strengths

a. Software development & designing capabilities of Indian engineers.

b. Cost advantage in R&D.

c. Cost competitiveness in terms of Labour cost in the country.

d. High growth rate of the telecom networks world-wide in general and Indian network in specific.

e. Short technology cycle which require fast upgradation of the networks to cater to the technological upgradation.

f. Vast pool of talent and young population in the country who are capable of conducting research, innovation, design & development.

g. Trusted partners & secured information infrastructure.

h. A strong foundation of talent, capabilities and technology for creating our own world-class 4G and 5G telecom products.

i. Availability of big industrial groups who are capable of investing in the design, development and manufacturing of telecom equipment.

Weaknesses

a. High cost of testing & certification

b. Poor Infrastructure

c. Restrictive tender conditions, unreasonable technical specifications and non-implementation of the Make-in-India policies in tenders in public procurements.

d. Inability of domestic industry to reach economies-of-scale due to lack of business.

e. Due to poor market presence and lesser acceptance of indigenously manufactured products, the manufacturers find it difficult and financially unviable to put in place end to end repairs/maintenance network/facilities for their products.

f. Lack of any incentives to private telecom operators to buy domestic products.

g. Non-availability of financing options for indigenous manufacturers.

h. Lack of business results in domestic industry's inability to continually invest in R&D.

i. Lack of investment in design, development and manufacturing of indigenous telecom equipment vis-à-vis the development of telecom technologies.

j. Weak monitoring mechanism for design, development and manufacturing of indigenous telecom equipment.

k. Insufficient support for Design, R&D etc. from Government.

l. Lack of sufficient mechanism for enhancing innovation, active creation and filing of patents as well as ensuring high conversion rates of patents into commercially successful products. Further, non-availability of facility to know the number of patents that would be forming part of their products, there was no methodology of knowing the rates of royalties beforehand, and the manufacturers are drawn into legal suits once their product is successful and profitable.

m. Absence of design, development and manufacturing units for the electronic components.

n. Multiple Standardisation Agencies.

o. The higher cost of Capital, Power, and Infrastructure etc in the country in comparison with the developed countries. As

	per E&Y survey[10] and World Bank Report 2016[11], it is 13-14% and 15 % higher respectively; the competitiveness is affected due to higher costs. **p.** Most of the semiconductor components are required to be imported for manufacturing of electronic equipment.
Opportunities **a.** Huge domestic market. **b.** The demand of telecom equipment for core & access networks may multiply in future due to programmes like Digital India, Smart Cities, Industry 4.0, 5G implementation etc. **c.** Most of the future technologies would also ride on the telecom networks hence rapid adoption and deployment of these technologies would require a robust local telecom manufacturing support to reap the benefits of early mover. **d.** Requirements of 5G networks to enable high speed all-pervasive broadband, Internet-of-Things (IOT), Machine-to-Machine (M2M) communication and Digitalisation of societies. **e.** A big market in ASEAN/ SAARC, Africa and Latin American countries for export. **f.** Geopolitical concerns surrounding U.S-China trade tensions providing an economic tailwind. **g.** Introduction of various government initiatives like Make in India, Digital India, etc. resulting in the growth of domestic manufacturing. **h.** Line of Credit and Grant in Aid projects financed by the Government of India.	**Threats** **a.** Competition from other global players who enjoys economies of scale. **b.** Unfair trade practices, long-term credit terms, ready-to-use products and predatory pricing used by OEMs from foreign countries. **c.** Inadequate local market size as the demands are skewed in favour of imported telecom equipment from MNCs. **d.** Higher entry barrier for local telecom manufacturers as MNCs are supported by credit finance agencies, enjoys economies of scale and earn higher revenues due to large volumes resulting in higher entry barrier for the local telecom equipment manufacturers. **e.** Importing finished products as Semi Knock Down (SKD) kits, e.g. Populated PCB and modules of all equipment under ITA-1, inspite of the fact that the same are not included in ITA-1[12].

The strategy, for supporting the Indian industry for promotion of the export of telecom products, shall be such as to utilise the strengths of our country in general and telecom sector in specific, after taking care of the threats and removing the weaknesses by exploiting the opportunities available to achieve the targets of export with zero import of telecom products.

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[10] https://www.ey.com/Publication/vwLUAssets/ey-cost-of-capital-india-survey2017/$FILE/ey-cost-of-capital-india-survey-2017.pdf

[11] https://lpi.worldbank.org/sites/default/files/International_LPI_from_2007_to_2016.xlsx

[12] https://www.meity.gov.in/writereaddata/files/Information_Technology_Agreement_1996.pdf

Chapter-4: Targets Envisaged

4.0 Delivering measureable, time-bound results: The following can be the measureable, timeline-wise targets for becoming 'आत्मनिर्भर भारत' in telecom sector:

4.1 Short Term Goals (One year Period):

a. Import substitution of over Rs. 10,000 Crores, with domestic value-addition of more than 40%.

b. Development and commercialization of all core telecom equipment required for 4G networks roll out as well as high-speed home broadband rollout (GPON).

4.2 Medium-Term Goals (1-3 Years Period):

a. Development and commercialization of all core telecom equipment for 5G networks.

b. Import substitution of over Rs. 50,000 Crores.

c. Exports of over Rs 50,000 Crores.

d. India becomes fully self-reliant for all its strategic telecom needs.

e. Becomes a global player in 4G and 5G core telecom equipment.

f. Net-zero imports of telecom equipment in the country

4.3 Long-Term Goals (More Than 3 Years Period):

a. Net-zero import of discrete components used for the manufacture of telecom products.

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Chapter-5: Strategies for Export Promotion

5.0 **Brief Background:** Trading in goods have been taking place since time immemorial. It proliferated with use of land trade routes like the famous silk route and establishment of maritime routes which also led to establishment of colonial empires. The concept of mercantilism came to be perceived in the 16th century whereby the objective was to promote trade surplus by boosting exports and restricting imports through protectionism and thereby avoid trade deficit to earn more gold. In spite of all the subsequent sophistry in developing nuanced trade theory models, earning trade surplus is the core principle even now. How this happens have been subject to intense research over the years. The first analytical model was conceived by Adam Smith in 1776 in his treatise on Wealth of Nations where he propounded the theory of Absolute Advantage whereby countries would trade in goods where they had absolute advantage. This was modified by David Ricardo (1817) who is called the father of international trade. He propounded the theory of relative or comparative advantage. Countries would trade in goods where they had relative advantage. Hekschar-Ohlin further fine-tuned this approach to factor proportions theory related to the four factors of production. Others like Schumpeter denoted the swings in trade cycle to gales of creative destruction caused by inventions/ game changing technological changes or innovations. In fact technological innovation could be possibly conceived as a fifth factor of production.

5.0.1 Paul Krugman, Nobel prize winner in 2008, gave a new slant to the concept of comparative advantage in trade theory recognizing the role of Monopolistic Competition in giving comparative advantage. The factors contributing to this situation are the advantages of being an early bird and achieving significant economies of scale which makes it difficult for later entrants to compete leading to a situation of Monopolistic Competition. Therefore, for a new entrant to reach a level of maturity early gives it a very strong comparative advantage. This is in some respects a corollary of technogical innovations happening in the IT and IT enabled services sector.

5.0.2 There were institutional changes in the framework of International Trade after the Second World War. There was a move away from Bilateralism to Multilateralism. In 1947 there was a General Agreement on Tariffs and Trade (GATT) to reduce trade barriers by reducing tariffs and Quotas. However, ITO (International Trade Organisation) could not be set-up but later came in 1995 as WTO which covered not only Goods but also Services and Intellectual Property rights and also had a dispute settlement body. Regional Trade Agreements also happened for further facilitating free trade within that region.

5.0.3 However, presently Multilateralism is facing challenges from centrifugal forces and unilateral action is being taken. The Appellate Body for dispute resolution is practically non- functional. At the same time rapid technological changes, particularly in the field of information technology, are throwing up new challenges. Networking is promoting the concept of a global village which is breaking down barriers with far reaching effect by raising concerns of Privacy, Data Protection and Cyber Security. The immediate challenge is to become part of a global supply chain so as to accelerate trade promotion and exploit relative advantages by using and creating new technologies. **All the strategies delineated in the subsequent sections are for achieving this goal at the earliest in a challenging environment where both centripetal and centrifugal forces are at work.**

5.1 **Time Spans of Strategic Planning for Export Promotion:** The strategy involving various activities, for promotion of export of telecom equipment, can be categorised into short, medium and long term spread over a period of one year, one to three years and more

than three years respectively. Some of the activities, which are under short-term category, are repetitive in nature whereas the others require one-time measure. The activities, of repetitive nature, needs to be undertaken year after year for promotion of the export, however, the implementation of one time activities shall have to be monitored closely for their requisite results. All the steps/ activities have been listed in detail with short, medium and long-term objectives as under:

5.2 Short Term Strategies (One year period)

5.2.1 Organising Stake Holder Events: Due to the Covid-19 pandemic, spread all over the world, it is not possible to organise the physical events at various places. Therefore, virtual events will be organised to promote the telecom products as under:

a. Organising Indian Pavilion in important International trade shows, such as Africa-Com, ConnecTech Asia, Broadband World Forum, Mobile World Congress, BASIS Soft Expo etc. in order to create Brand India Image.

b. Holding of Sector Specific Telecom/ICT Shows in focus Area to explore new markets and strengthen the existing markets such as :

i. India-Africa Telecom Expo

ii. India-ASEAN Telecom Expo

iii. India-CIS Telecom Expo

iv. India Telecom

c. Organise Reverse Buyer-Seller meet in India and abroad.

The above activities will be repeated year after year for promotion of the telecom manufacturing industry of India to achieve self-reliance in domestic market and increasing export year by year. After Successful eradication of Covid-19 pandemic, the physical events will be organised due to their comparative advantage vis-à-vis the virtual events.

Action by: TEPC with the financial support from Department of Commerce & Department of Telecommunications.

5.2.2 Study of Various Policies & Suggestions to Government: Studying various policies and interface with Government for policy concerns/ suggestions to promote export of telecom equipment gradually and steady.

Action by: TEPC

5.2.3 Dissemination of Information to Stakeholders: Keep ICT stakeholders'/ exporters updated on latest developments in Policy and Regulatory front including PMI, NDCP, 5G field trial, Budget Proposals etc. and take up the issues faced by them with the appropriate authorities.

Action by: TEPC

5.2.4 Production Linked Incentives: Attaining economies of scale would be the key to our export competitiveness hence domestic companies need to be encouraged to enhance production capacities and substitute import of telecom equipment to mitigate the handicaps. Production Linked Incentive Scheme is under consideration in Department of Telecommunications which should encourage existing and new units by extending fiscal incentives for incremental production. Scheme should promote production efficiencies of existing units by outsourcing or subcontracting to specialised units within India to optimise production cost and this scheme must not limit itself to increased capital investment. The scheme, when implemented, will provide the thrust to the telecom manufacturing in the country to attain economies of scale and become globally competitive.

Action by: Department of Telecommunications

5.2.5 Enforcement of PPP-MII policy: The PPP-MII is a single most powerful policy that can help resurrect the domestic manufacturing industry but its ground level implementation needs clarifications and amendments to arrest policy circumvention by procuring agencies. Scope of policy needs to be enhanced to include purchases made by Private Telecom service providers and

also 'State level projects'. Clarifications and strict implementation in the desired spirit will resurrect domestic industry and increase Global competitiveness. The Department of Telecom, as a nodal department must act swiftly and address any non-compliance of PPP-MII orders in any tender involving telecom products.

Action by: Department of Telecommunications and Department for Promotion of Industry and Internal Trade.

5.2.6 Strict Imposition of the Reciprocal Clause-10d of Preference to Make in India (PMI) Order of DPIIT: Department of Telecommunications, Ministry of Communications must keep a list of such countries along with the list of products updated from time to time. Countries that don't import products from India, for which capability and capacity exists in India, should be considered as restricting free import by erecting tariff or non-tariff barriers. The procurement agency should check with the nodal Ministry for details of such countries where this reciprocity clause should be applied. The strict compliance to the aforesaid list must be ensured.

Action by: Department of Telecommunications & Various Purchasing Authorities.

5.2.7 Implementation of the Mandatory Testing & Certification of Telecom Equipment (MTCTE): The telecom equipment are capable of routing or redirecting user data traffic, permitting visibility into user data or packets, causing network traffic to be disrupted remotely and the espionage & malafide nature of the countries such as Peoples Republic of China, hence, poses an "unacceptable risk" to the national security and the security & safety of persons.

DoT, vide its notification[13] dated September 05, 2017 had notified that ***"Mandatory Testing- Any telegraph which is used or capable of being used with any telegraph established, maintained or worked under the licence granted by the Central Government in accordance with the provisions of section-4 of the Indian Telegraph Act, 1885 (hereinafter referred to as the said Act), shall have to undergo prior mandatory testing and certification in respect of parameters as determined by the telegraph authority from time to time."***

However, till now though almost all the 'Essential Requirements' have been issued but none of the 'Security Requirements' have yet been issued. Further, the MTCTE has since been implemented only for few of the telecom equipment and the Indian telecom networks are quite vulnerable. Therefore, considering the security of the country and the users, it becomes indispensable to implement the Mandatory Testing & Certification for all the telecom equipment on immediate basis**.**

Action by: Telecommunications Engineering Centre, Department of Telecommunications.

5.2.8 Imposition of Stipulated Basic Custom Duty (BCD): In line with "Make in India" initiative of the Government[1], and to provide level playing field, ensure better capacity utilization and achieve import substitutions, custom duty was increased on goods, inter-alia, like specified electrical/ electronic/ telecom equipment and hardware. The details of various notifications, in respect of custom duty on Telecom & IT equipment, issued by Directorate General of Foreign Trade, Ministry of Finance are given in Annexure-2 where sometimes within an HS code only certain items of specified description attract BCD. It has come to the notice that the goods are often classified under different HS code or in desired HS code but with different description to circumvent the BCD and make it eligible under ITA-1 zero duty structure. The category 'Others' included in the list of items under ITA-1 is ambiguous and often exploited by the foreign manufacturers to import their items in India with applicable exemptions under ITA-1; this incidentally may have worked to the disadvantage of the local telecom equipment manufacturers hence

[13] https://dot.gov.in/sites/default/files/06Sept.pdf?download=1

loopholes for circumvention of BCD need urgent correction.

Levying zero custom duty or less than the stipulated rate, on the import of the goods, defeats the very purpose of imposing it. Such practices badly impact the domestic industry and thereby even defeating the Make in India programme of Government of India.

Further, many equipment, which did not even exist at the time when India signed WTO ITA-1 agreement, are given the benefit of zero duty. In view of above, actions may be taken as under:

a. Levying stipulated custom duty on finished goods must be ensured to safeguard the Indian domestic telecom industry.

b. In order to address the issues concerning the imports of telecom products at zero percent duty rates under the ITA provisions, an experts group comprising of the representatives from telecom sector, trade, taxation, and legal professionals should be constituted to identify the telecom products, which are not covered under the provisions of ITA-1. For immediate push to development of indigenous telecom equipment manufacturing industry, the expert's group should also suggest suitable level of tariffs on import of such telecom products which are not covered under ITA. TRAI has also recommended same through its Recommendations, dated August 3, 2018, on Promoting Local Telecom Equipment Manufacturing.

The Expert Group shall be asked to discuss with the industry, deliberate and submit its report within a shortest stipulated time span.

Action By: Central Board of Indirect Taxes & Customs

5.2.9 Rationalisation of Custom Duty: The custom duty is levied on import of certain electronic components. On the other hand, an equipment, in which such electronic components are built-in, is imported at zero BCD under ITA1. Such BCD structure makes the Indian manufactured finished product costlier as compared to the imported finished telecom equipment/ products. Therefore, the issue of import duty structure on 'components used in telecom equipment' and 'finished telecom equipment' needs to be reviewed in detail to remove such anomalies.

Action By: Central Board of Indirect Taxes & Customs, Department of Telecommunications

5.2.10 Telecom Investment Summit: Telecom manufacturing is an advanced technological and capital-intensive sector. Further, it requires keeping pace with the fast-changing technology and therefore, continuous research & development is the key factor to survive in the competitive international & domestic telecom markets. Considering the huge quantum of the requisite investments, 'Telecom Investment Summit' may be organised by the Department of Commerce and Department of Telecommunications. The big Indian industrial groups like L&T, Tata, Birla, Adani, Mahindra, Reliance etc. may be invited in the summit, motivated and asked for investment in the telecom manufacturing sector. These industrial groups may also collaborate with the companies planning to shift their manufacturing base from Peoples Republic of China.

Action by: Department of Commerce, Department of Telecommunications and TEPC.

5.2.11 Over-due Payments from Government & Centre/ State Public Sector Enterprises: Overdue payments from BSNL (including for the Bharatnet project, which is funded by the USO Fund), other Government departments and CPSEs/ SCPEs, is a serious issue as it adversely affects the financial health of the domestic telecom industry. The payments have been delayed for up to two years and any further delay in the current situation is increasing the risk of survival of the domestic industry, which is already stressed, especially after the COVID-19 pandemic.

It may be noted that most of the companies, for whom payment is pending, are in MSME category and such an amount is substantial for

such size of the enterprises. **Apart from the country's image as far as 'Ease of Doing Business' is concerned, such a huge pending payment creates a substantial stress on company's working capital needs.** In addition, their interest cost increases reflecting, finally, on their future products prices which may make them non-competitive vis-à-vis the Multi-National Companies (MNCs) enjoying the economies of scale due to their world-wide supplies. Consequently, the suppliers as well as the purchasers may suffer. The details of pending payments of various domestic manufacturers, as on July 31, 2020, are enclosed as Annexure-3.

Action by: Department of Telecom/ USO Fund/ Concerned CPSEs/SPSEs/Ministry of Finance.

5.2.12 Incentives to Public Sector/ Private Enterprises for Execution of High-Level Projects in Foreign Countries: Indian PSUs undertake several high value projects for establishing telecom networks in the friendly foreign countries. Deploying indigenous telecom products by these agencies in their projects would not only help in projecting the Indian technical prowess but would also facilitate in promoting the local telecom equipment manufacturing sector. Therefore, to promote deployment of indigenous products in the telecom networks, capabilities of local System Integrators like TCIL, ITI and other private entities should be harnessed by extending suitable incentives. TRAI has also recommended same through its Recommendations, dated August 3, 2018, on Promoting Local Telecom Equipment Manufacturing.

New Bilateral agreements or amendments to existing agreements may be signed with developing countries for supply of telecom equipment coordinated through govt agencies like TCIL with some inbuilt subsidy from Govt.

Action by: Department of Telecommunications/ Department of Commerce.

5.2.13 Implementation of PPP-MII Policy in Projects under Line of Credit (LoC)/ Grant-in Aid from Government of India: Government of India extends Line of Credit to various countries under Indian Development & Economic Assistance Scheme (IDEAS). Department of Economic Affairs, Ministry of Finance issued guidelines in respect of IDEAS vide their Office Memorandum No. 21/6/2008-CIE-II dated July 23, 2010 which were revised vide their OM[14] No. 21/2/2015-IDEAS dated December 7, 2015. At that point of time, the Public Procurement (Preference to Make in India) policy (PPP-MII) was not in existence though certain departments, including Department of Telecommunications, had notified Preference to Make in India (PMI) policy for the respective sector. Subsequently, the then Department of Industrial Policy & Promotion (presently Department for Promotion of Industry & Internal Trade), vide Office Memorandum No. 45021/2/2017-B.E.-II dated June 15, 2017, issued comprehensive PPP-MII order during 2017 wherein concerned nodal departments/ ministries were authorised to notify, inter-alia, local content etc. Further, during the implementation of IDEAS guidelines, certain issues have been observed which needs to be addressed. In view of the above, IDEAS guidelines needs to be revised. PPP-MII policy order of DPIIT and subsequent notification of DoT may be followed while procuring telecom equipment for LoC/ Grant-in-Aid projects.

a. In case of EPC/ Turnkey contracts, the PPP-MII orders shall be applied on line item-wise basis so that the policy is followed in its letter & spirit. Therefore, clause-5 may be revised to include the following:

i. All LoC/ Grant-in-Aid projects of GoI for foreign countries, where GoI provide the fund, Public Procurement

[14] https://www.dea.gov.in/sites/default/files/Exim_LoC.pdf

(Preference to Make in India) Order should apply for sourcing from India. In order of implementation of PPP-MII orders of DPIIT in LoC/ Grant-in-Aid projects, an additional clause in the IDEAS guidelines shall be added as under:

"The Public Procurement (Preference to Make in India) Order 2017 issued by Department for Promotion of Industry & Internal Trade (DPIIT), Government of India, as amended from time to time, in conjunction with such orders that are issued by the concerned nodal department/ ministry under PPP-MII policy mandate shall be applicable for all LoC/ Grant-in Aid Projects."

ii. Existing ceiling of minimum 75%, for sourcing of goods & services from India, should be encouraged to be increased to higher level; best case scenario could be reaching 100% wherever possible.

iii. Sourcing of equipment imported into India and re-exported for LoC/ Grant-in-Aid projects should not be treated as Indian equipment unless there is substantial value addition in India through the process of manufacture (as per PPP-MII order of DPIIT and PMI notifications of respective nodal department/ ministry) and rules of origin are satisfied.

iv. In Line of Credit/ Grant-in-Aid projects involving products from multiple verticals such as IT/ telecom, Power, civil construction etc., threshold of percentage sourcing from India should be applied for each vertical independently.

v. The procurement process should be designed to support Indian domestic Industry and eligibility conditions covering experience, turnover, Indian Standards or their equivalent should be non-discriminatory for Indian Industry.

b. In the procurement of telecom equipment under LoC/ Grant-in Aid projects, the reciprocating clause-10d of PPP-MII order of DPIIT shall be followed. DoT has identified items against reciprocating clause-10d of PPP-MII order of DPIIT. The same may be incorporated for the telecom product procured under IDEAS.

c. It has also been observed in last few tenders that the technical specifications included in the tenders are not generic due to which the Indian OEMs are unable to participate in the tender. It shall be ensured by EXIM Bank/ other agency floating the tender that the specifications are generic in nature so as to enable Indian OEMs to participate in the process. Generally, Indian OEMs comply with the 'Generic Requirements' (GR) issued by Telecom Engineering Centre (TEC), Department of Telecommunications. Therefore, either the GRs issued by TEC shall be referred or their contents shall be used as technical specification in the concerned tenders.

d. The clause-3.7 of IDEAS guidelines stipulates as under:

"3.7 The borrowing country is fully responsible for repayment and servicing of the loan. The borrowing country must provide sovereign guarantee for repayment and servicing of the loan in case the loan is taken by its agency."

The telecom services in almost all the countries are either corporatised or privatised. Therefore, the concerned Governments are reluctant to provide the 'Sovereign Guarantee' in respect to the telecom projects. An alternative option could be considering proposals submitted by a borrowing Government backed guarantee by a Joint Special Purpose Vehicle (JSPV) formed in borrowing country whose partners may include

concerned Government, Telecom Service Provider(s) and Bank(s)/ Financial Institution(s). The operations of JSPV can be limited to the acquisition, operation, maintenance and financing of specific Line of Credit project's assets.

Action by: Ministry of Department of Economic Affairs, Ministry of Finance.

5.2.14 Production of Electronic Components: The basic raw materials, for manufacturing the telecom products, are mainly electronic components, integrated circuits etc. which constitute the major kitty as far as import of components is concerned. The production of integrated circuits involves designing, fabricating the chips and packaging the same. Indian engineers have the talent of designing the integrated circuits. To start with, the multi-national companies, which are world leaders in manufacturing ICs and discrete electronic components, may be invited for establishing their designing divisions in India. Fabricating the integrated chips involves huge capital investment, therefore, may, as a first step, be carried out abroad which may be in Taiwan and subsequently packaging of Integrated circuits may be done in India. MeitY has notified Scheme for Promotion of manufacturing of Electronic Components and Semiconductors (SPECS) on April 1, 2020 to offset the disability for domestic manufacturing of components and semiconductors; there is a need to implement the policy in right perspective as enunciated above.

Action by: Ministry of Electronics & Information Technology (Meity)

5.2.15 Study of Chinese and Vietnam Models of Attracting Foreign Investments: The Peoples Republic of China attracted companies from world-over to establish their manufacturing base in China resulting the country becoming a manufacturing hub. However, due to the trade war between United States of America and China and the suspicious role of China in spreading the Covid-19 virus, large numbers of the companies have either shifted their manufacturing facilities or planning to shift the same elsewhere. Out of them, many companies have shifted to Vietnam ignoring India as one of the contender countries. Therefore, there is a need to study the commercial environment, policies and the Government support extended to telecom/ other equipment manufacturing companies by China and Vietnam with a view to adapt suitable model for promoting manufacturing base in India.

A study group needs to be constituted for the aforesaid study; the study group shall submit their report within a shortest stipulated time period.

Action By: Department of Telecommunications, Department of Commerce, TPES.

5.2.16 Institutional Mechanism for Monitoring Telecom Equipment Manufacturing: In order to promote rapid development in all aspects of telecommunication including technology, production, and services, on March 11, 1989, the Government setup Telecom Commission[15]. As per the resolution dated March 15, 2016, notified in the Gazette of India, the Telecom Commission is composed of Chairman, four full time members i.e. Member (Finance), Member (Production), Member (Services) and Member (Technology); and the four part-time members i.e. Secretary (Ministry of Electronics and Information Technology), Secretary (Department of Economic Affairs), Secretary (Department of Industrial Policy and Promotion) and Chief Executive Officer, NITI Aayog[16].

Accordingly, till late 90s, the progress of telecommunication equipment manufacturing in the country was monitored by Telecom Commission through Member (Production). This resulted in design, development, and

[15] http://www.dot.gov.in/sites/default/files/2016_05_26%20Res%20PolicyI.pdf?download=1%3Cbr%20/%3E
[16] https://dot.gov.in/sites/default/files/Res%20Policy-II.pdf

manufacturing of telecommunication equipment for fixed line networks as well as consumers in the country. In fact, the indigenously developed C-DoT technology telecom exchanges for fixed line networks were exported to many countries.

After liberalisation and privatisation of the telecom sector, perhaps more emphasis may have been given to the development and roll-out of telecom services vis-à-vis indigenous design, development and manufacturing of telecommunication equipment resulting in the phenomenal growth of the telecom services sector. Further, the investments in the R&D and manufacturing space did not keep pace with the rapid developments in the telecommunication technologies during the last two decades. Having considerable progress been made in the development of telecommunications services and emergence of telecommunication infrastructure as backbone for economy as well as national security, it is now equally important to promote the local telecom equipment design, development, and manufacturing to not only meet our domestic equipment requirements but also export these equipment to other countries.

In view of the foregoing, for ensuring the focussed attention in DoT on manufacturing of telecom equipment within the country, the progress of telecommunication equipment manufacturing in the country should be monitored in DoT at least at the level of Member, Digital Communications Commission. For a time bound progress, a dedicated unit in DoT should be made responsible for facilitation and monitoring of telecommunication equipment design, development, and manufacturing in the country.

TRAI also recommended, as above, in its recommendations on 'Promoting Local Telecom Equipment Manufacturing' released on August 3, 2018. The TRAI recommendations may be acceded and implemented.

Action By: Department of Telecommunications.

5.2.17 Creation of Telecom Finance Corporation for incentivising buying of indigenous products: Inspite of availability of the Indigenous products, the private telecom service providers are reluctant to buy the same. One of the main reasons is vendor's credit at low interest rates along with a moratorium period of 4-5 years.

Therefore, on the lines of Indian Railway Finance Corporation and NHAI, Infrastructure Investment Trusts (InvIT), a Telecom Finance Corporation/ InvIT may be established, by the Government of India, for telecom sector for providing long term soft loans with certain moratorium period to the telecom service providers who buy the indigenous telecom equipment.

Action By: Department of Telecommunications.

5.2.18 Training to the Personnel of Purchasing Entities Importing the Indian Telecom Products: Ministry of External Affairs provides training (civilian and defence) in India for nominees from ITEC partner countries under Indian Technical and Economic Cooperation (ITEC) Programme. It is recommended that training may be provided to the personnel of the foreign purchasing entities who import the Indian telecom products. It will provide additional support to the exporters of telecom equipment and will provide a boost to the export of Indian telecom equipment in ITEC countries.

Action By: Department of Telecommunications, Ministry of External Affairs.

5.2.19 Action Regarding Non-Tariff Barriers: Indian telecom manufacturers have reported non-tariff barriers imposed in number of countries as listed in Annexure-6. Steps needs to be taken to overcome such non-tariff barriers so as to enable the Indian telecom equipment manufacturers to export their equipment to such countries.

Action By: Department of Telecommunications, Department of Commerce.

5.2.20 Earnest Money Deposit (EMD) & Performance Bank Guarantee (PBG): The whole telecom industry is facing the problems regarding amount of EMD and PBG and their validity requirements. The PBG is taken by the telecom CPSEs as 5-10% of the contract value whereas the EMD is mostly 2-5% of the contract value. As a result, lot of amounts of vendors gets locked-in against EMD and PBG which is non-productive and a sheer wastage of money. It is estimated that approximately Rs. 4, 000 crores worth of PBG & EMD are locked-in in BSNL, MTNL, TCIL, Bharatnet projects (BBNL) and ITI. In present circumstances, it is unnecessarily adversely affecting the working capital and thereby the cash flows of the MSMEs resulting in financial distress to them. Hence, it is recommended that all the telecom CPSEs shall seek only 1-2% and 0.5-1.0% of the contract value as PBG and EMD respectively. Such value of PBG and EMD will help the manufacturers specifically during the Covid-19 pandemic time.

One of the alternatives may be adopting point system in case of registered vendor without submission of EMD/PBG. In case, PBG is required in that case it shall not be more than 1-2% which can either be submitted against receipt of P.O. or may be deducted from the payments made to the vendor on pro-rata basis.

Action By: Department of Telecommunications, Department of Commerce

5.3 Medium Term Strategies (1-3 Years period)

5.3.1 Stricter Enforcement of Anti-Dumping and Anti-Circumvention Rules:

Stricter enforcement of anti-dumping and anti-circumvention rules with regard to telecom product imports as per various notifications/ Office Memorandum/ Orders issued by Government of India from time to time.

Action By: Department of Commerce, Department of Telecommunications

5.3.2 Support for Research & Development of Telecom Products:

The conversion ratio from research to filing of patent by academic institutions in India is very poor as compared to developed nations[17]. There is, therefore, a need to encourage active participation of industry and academia in R&D. Telecom Centres of Excellence (TCOEs) **TCOE** India was created as a PPP initiative by the Department of Telecommunications, Government of India in 2007, to strengthen the R&D ecosystem in ICT where Government works as a facilitator, Industry as the ultimate user and academia as the research unit.

However, apart from gaining academic knowledge by the academicians and students, there had not been much tangible development of telecom products. In today's competitive environment, private organisations may not be able to venture into the research & development of telecom products as any business organisation weigh the cost benefit analysis; more so when the life of any telecom product is depleting day by day due to continuous & rapid advancement of technology in the sector. Therefore, following shall be adopted:

a. **Revamping the C-DoT:** C-DoT shall function as a scientific research & development organisation rather than a bureaucratic set-up. Therefore, it shall be made a true autonomous institution, headed by a visionary, capable & competent technocrat so as to allow it function independently and concentrate completely on research & development activities. National Digital Communication Policy 2018 also envisages, ***"promoting research & development in Digital Communication Technologies by restructuring C-DOT as a premier Telecom Research and Development Centre for identification, customization, and development of***

[17] http://www.indiaenvironmentportal.org.in/files/file/economic%20survey%202017-18%20- %20vol.1.pdf

digital products and services in the country as per indigenous needs."

b. Setting-up More Research & Development Institutions: Government of India shall invest in the research & development of telecom products and set-up sufficient number of autonomous institutions for the purpose.

c. Setting up the Institution under Public-Private-Partnership (PPP) Model: Apart from the autonomous institutions funded by the Government of India, there could be private sector institutions whom shall be treated in the same way as the Government institutions.

d. Institutional Mechanism for Effective Disbursal & Utilisation of R & D Funds/ Corpus: It is necessary to setup an institutional mechanism for effective disbursal and utilisation of R&D funds recommended in the subsequent Para. The institutional mechanism should be capable of evaluating the proposals in the areas identified by TEPC, and monitoring the effective utilisation of the funds. Accordingly, a multi-disciplinary Telecom Equipment Development Board (TEDB) on the lines of the Technology Development Board (TDB), which works under the Chairmanship of Secretary, Department of Science & Technology, should be constituted in the DoT, under the TEC, for executing speedy and comprehensive decisions related to funding and incentivisation of design, development and manufacturing of telecommunication equipment in the country. Such Board shall also be responsible for facilitating innovation, R&D, and setting up of testing labs for the telecom sector in the country.

Apart from revamping and creating the institutions and institutional mechanism, as above, following is required too:

i. National Digital Communications Policy 2018 envisages, ***"Creating a Fund for R&D in new technologies for start-ups and entrepreneurs to enable innovation in cutting edge communications, 5G, software, content, security and related technologies and applications; and commercialization of products and services through grants, scholarships, venture capital, etc."*** A Research & Development corpus of Rs 5000 Crore may be created, so as to ensure that adequate level of funding can be provided to promote research, innovation, standardisation, design, testing, certification, and manufacturing of indigenous telecom equipment. This should be further augmented on annual basis to attain self-reliance in the space of telecom networking and user equipment. This amount will have a high ROI, and can easily be recovered from the value that the domestic telecom products and eco-system will create within the country.

ii. The research being done in academic institutions must be tightly connected to the needs of the industry. In addition, we must support start-ups, who can bring out the best innovations in specific technology areas and whose products can be successfully commercialised.

iii. Adequate resources should also be dedicated for India's participation in global standards bodies such as ITU, 3GPP, IEEE etc. so that we can drive future standards that have relevance for India, rather than being a follower.

iv. It is important to secure licensing rights to background IPR on FRAND (Fair reasonable and Non-Discriminatory) terms from global players. Any new telecom equipment will often use background IPR, which may have been patented by a foreign player. The need for this has already been envisaged in the Digital Communications Policy of 2018.

v. To incentivize R&D spending, fiscal incentives such as tax breaks (200% on R&D) must be re-instated.

Action by: Department of Telecommunications.

5.3.3 Incentive for Procurement of Indigenously Designed Products: The Indian Telecom Operators are reluctant in using the Indian telecom product due to predatory price offered by the MNCs in general and Chinese companies in specific. Notwithstanding that the Clause-24.3, Chapter-4, Unified Service License Agreement[18] stipulates as under:

"24.3 The licensee shall adhere to the prevailing directions/ instructions and shall also abide by further directions / instructions as may be issued by LICENSOR from time to time in respect of

(a) Preferential Market Access for procurement of indigenous manufactured products,

(b) Mandatory testing of equipment and

(c) Requirements on IPv6 implementation."

The extract of the aforesaid clause of 'Unified Service License Agreement' is enclosed as Annexure-4. Department of Telecommunications as Licensor, as per powers conferred from the above clause of the Unified Service License Agreement can very well mandate all the TSPs, including private service providers, for Preferential Market Access for procurement of indigenous manufactured products; consequently, there is no reason for DoT being not able to invoke the above said clause of the License Agreement as a Licensor.

A separate Preferential Market Access Policy, for procurement of indigenously manufactured products, applicable to the TSP needs to be formulated as the Public Procurement (Preference to Make in India) orders issued by Department for Promotion of Industry & Internal Trade (issued under Rule-153(iii) under General Financial Rules 2017) are applicable for the procurement by various Departments/ Ministries of Government of India.

However, if for some binding reason, DoT finds itself unable to enforce powers conferred from the Unified Service License Agreement, a proposal, on the subject, has been prepared and is enclosed as Annexure-5. It may also be mentioned that National Digital Communications Policy 2018 (NDCP-2018) also stipulates incentivising the telecom service providers for procurement of domestically manufactured telecom equipment.

We are very confident that either by invoking the aforesaid Unified Service License Agreement condition or incentivising the Telecom Service Providers for purchase of indigenously designed, developed & manufactured equipment will pave the way for आत्म निर्भर भारत in telecom sector.

Action by: Department of Telecommunications and Universal Service Obligation Fund.

5.3.4 Corpus for Export Promotion: It is important to invest in effective branding of Indian telecom products and solutions in international markets. We can leverage the fact that India has been a role-model for transforming a traditional economy to digital economy. Our success in Bharatnet, eGovernance, e-education, financial inclusion etc. provides us a great reference.

A telecom export promotion fund should be set up for this purpose for market development, grant-in-aid, marketing subsidy for participating in global trade shows, both physical and virtual, and business development.

Action by: Department of Telecommunications/ Department of Commerce.

5.3.5 Financial Support to Export Oriented Telecom Equipment Manufacturers: Availability of capital, soft-loans, contract financing, and credit default insurance are important for promoting the productivity of existing units and promoting the manufacturing in the telecom equipment sector. Countries like China have state owned organizations like Sinosure[19] which looks after the capital and

[18] https://dot.gov.in/sites/default/files/Unified%20Licence_0.pdf?download=1

insurance requirements of Chinese manufacturers in various sectors. India also has in place ECGC Ltd., a Government of India enterprise, with similar objectives but probably the extent of support, it extends to the telecom equipment manufacturers, may not be the same as Chinese companies get in their country. In order to address the concerns relating to non-availability of financing options for promoting the sales of the indigenous telecom products, DoT should coordinate with Ministry of Finance for making available the following financing options, in line with the practices followed by other export-oriented economies, to indigenous telecom equipment manufacturers:

a. Venture capital in the form of equity and soft loans;

b. Project finance;

c. Contract financing options;

d. Credit default insurance.

TRAI has also recommended, as above, through its Recommendations, dated August 3, 2018, on Promoting Local Telecom Equipment Manufacturing.

Action by: Department of Telecommunications, Department for Promotion of Industry and Internal Trade and Ministry of Finance.

5.3.6 Rationalisation of Electricity & Water Supply Rates: The industrial electricity and water supply charges are higher than the normal rates. The domestic and other customers, such as agriculture customers, are cross-subsidised at the cost of Indian industry. For strengthening the industry financially and making the cost of production competitive, the electricity and water supply rates, for the industry, shall be rationalised. A time-bound action plan needs to be drawn up and implemented for the purpose.

Action by: Ministry of Power, GoI and State Power Distribution Agencies.

5.3.7 Compensation for Higher Cost of Capital & Labour: In the country, the cost of Capital, Power, and Infrastructure etc is higher by 13-15%[20] in comparison with the developed countries. Therefore, to be competitive in the domestic as well as international market places, the cost disadvantage in respect of capital & labour also needs to be compensated through sector specific financial incentives.

Action by: Ministry of Commerce and Ministry of Communications.

5.3.8 Channelising the Investment in Telecom Manufacturing Sector: The investment from the big Indian industrial giants like L&T, Tata, Mahindra, Reliance etc., who showed their inclination/ signed an agreement, during/ after the 'Telecom Investment Summit', for investing in telecom equipment manufacturing will be channelised to broaden the manufacturing base in the country.

Action by: Ministry of Commerce & Department of Communications.

5.4 Long Term Strategies (More than 3 Years period)

The long-term strategy for the manufacturing of telecom products and export promotion shall be to achieve the target of our Hon'ble Prime Minister viz.आत्म निर्भर भारत i.e. to achieve level of zero import of all telecom products (CKD, SKD and even the discrete components) and large quantum of export leading to the positive trade balance in telecom sector products and services. Therefore, the Long-Term Strategy shall include the activities as under:

5.4.1 Indigenous Production of Electronic Components: The Multi-National Companies, which are world leaders in integrated circuits (ICs) and other discrete electronic components and established their designing and packaging of Integrated circuits divisions in India, as per Para-5.2.14 above, may be encouraged & motivated to set-up complete manufacturing

[19] http://www.sinosure.com.cn/en/Sinosure/Profile/index.shtml

[20] https://www.ey.com/Publication/vwLUAssets/ey-cost-of-capital-india-survey2017/$FILE/ey-cost-of-capital-india-survey-2017.pdf

base for manufacturing of ICs and other electronic component in India including their fabrication in India. Further, the Indian giant companies (inclined to set-up such facilities) may be invited for setting-up the designing, fabricating and packaging of Integrated Circuits and other electronic components in India.

Action by: Ministry of Electronics & Information Technology (Meity)

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Annexure-1

Table - 2: Details of Export, Import & Trade Deficit of Telecom Equipment during Last Five Years

All figures are in U. S. $ Million

Categories	2015-16			2016-17			2017-18			2018-19			2019-20		
	Export	Import	Trade Deficit	Export	Import	Trade Deficit	Export	Import	Trade Deficit	Export	Import	Trade Deficit	Export	Import	Trade Deficit
Mobile	223.53	6058.56	-5835.03	171.55	3787.96	-3616.41	212	3537.29	-3325.29	1612.7	1616.48	-3.83	3837.12	1036.22	2800.90
Telegraphic Apparatus	500.96	4411.81	-3910.85	544.15	5508.05	-4963.9	953.52	6741.81	-5788.29	1076.9	7343.36	-6266.5	1019.10	4712.00	-3692.90
Parts of Telephonic/ Telegraphic Apparatus	339.28	5038.28	-4699	529.33	7439.58	-6910.25	258.45	11563.1	-11304.7	258.76	8712.69	-8453.93	304.53	7925.08	-7620.55
Telecom Cables	516.13	610.82	-94.69	556.94	579.64	-22.7	689.86	764.46	-74.6	716.52	951	-234.48	870.95	798.09	72.86
Total	**1579.9**	**16119.5**	**-14539.6**	**1802**	**17315.2**	**-15513.3**	**2113.8**	**22606.7**	**-20492.9**	**3664.8**	**18623.5**	**-14958.7**	**6031.70**	**14471.39**	**-8439.69**

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Details of Notification Issued by DGFT Regarding Telecom & IT Equipment

1. All the IT & Telecom products were brought under zero import duty under ITA-1 agreement vide notification[21] No. 24/2005-Custom Duty dated March 1, 2005 issued by Department of Revenue, Ministry of Finance.

2. Subsequently, vide notification[22] No. 11/2014-Customs, dated July 11, 2014 issued by Department of Revenue, Ministry of Finance, custom duty of 10% was imposed on the following goods:

- **a.** Soft switches and Voice over Internet Protocol (VoIP) equipment, namely, VoIP phones, media gateways, gateway controllers and session border controllers;
- **b.** optical transport equipments, combination of one or more of Packet Optical Transport Product or Switch (POTP or POTS), Optical Transport Network (OTN) products, and IP Radios;
- **c.** Carrier Ethernet Switch, Packet Transport Node (PTN) products, Multiprotocol Label Switching-Transport Profile (MPLS-TP) products;
- **d.** Multiple Input / Multiple Output (MIMO) and Long-Term Evolution (LTE) Products."

3. Later, the custom duty, on certain goods was increased from 10% to 20% vide notification[23] No. 74/2018-Customs dated October 11, 2018 issued by Department of Revenue, Ministry of Finance.

4. In addition, custom duty of 10%, on the Printed Circuit Board Assembly (PCBA) of the following goods (HS Code: 85177010), was imposed vide notification[24] No. 02/2020-Customs dated February 2, 2020:

- **a.** Base station.
- **b.** Optical transport equipment;
- **c.** Combination of one or more of Packet Optical Transport Product or Switch (POTP or POTS);
- **d.** Optical Transport Network (OTN) products;
- **e.** IP Radios;
- **f.** Soft switches and Voice over Internet Protocol (VoIP) equipment, namely, VoIP phones, media gateways, gateway controllers and session border controllers;
- **g.** Carrier Ethernet Switch, Packet Transport Node (PTN) products, Multiprotocol Label Switching Transport Profile (MPLS-TP) products;
- **h.** Multiple Input/Multiple Output (MIMO) and Long-Term Evolution (LTE) products.

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[21] https://www.cbic.gov.in/resources//htdocs-cbec/customs/cs-act/notifications/notfns-2005/cs-tarr2005/cs24-2k5.pdf
[22] https://www.cbic.gov.in/resources//htdocs-cbec/customs/cs-act/notifications/notfns-2014/cs-tarr2014/cs11-2014.pdf
[23] https://www.cbic.gov.in/resources/htdocs-cbec/customs/cs-act/notifications/notfns-2018/cs-tarr2018/cs74-2018.pdf
[24] https://www.cbic.gov.in/resources//htdocs-cbec/customs/cs-act/notifications/notfns-2020/cs-tarr2020/cs02-2020.pdf

Annexure-3

Table-3 : Details of Pending Payments with BSNL, Government Departments & CPSEs/ SPSEs

Rs. In Crores

Sl. No.	Vendor	Details of Pending Payments							
		BSNL	USOF BSNL as implementing agency	MTNL	BBNL	TCIL	ITI	Others*	Total
1.	Sterlite Technologies	130.00	462.00	20.00	7.00	-	-	727.80	**1,346.80**
2.	Prima Telecom Ltd	60.00	-	-	-	-	-	-	**60.00**
3.	Vindhya Telelink Limited, Rewa	33.59	-	-	2.46	-	-	-	**36.05**
4.	Birla Cable Limited.,Rewa	21.37	-	-	0.87	-	-	-	**22.24**
5.	Polycab India Limited	1.86	-	-	23.60	-	-	-	**25.46**
6.	Annu Infra Construct India Pvt. Ltd	15.34	-	-	-	-	12.98	-	**28.32**
7.	Ericcson	515.00	-	-	-	-	-	-	**515.00**
8.	Apar Industries (Uniflex Cables)	9.93	-	0.40	4.14	-	-	-	**14.47**
9.	Pranav Enterprises	0.39	-	-	-	-	-	-	**0.39**
10.	Tejas Networks	177.10	-	-	22.35	-	-	-	**199.45**
11.	Vihaan Network Limited	175.00	-	-	-	-	-	-	**175.00**
12.	Finolex Cables Ltd	33.23	-	-	5.75	32.50	-	-	**71.48**
13.	Paramount Wires & Cables – MSME UNIT	116.91	-	3.57	-	-	-	-	**120.48**
14.	Tirumula Seven Hills	2.53	-	0.02	-	1.43	-	-	**3.98**
15.	Aksh OptiFiber	38.09	-	-	-	-	-	-	**38.09**
16.	Xalted Information Systems Pvt. Ltd	3.50	-	1.10	-	-	-	-	**4.60**
17.	INVAS Technologies Pvt. Ltd.	1.38	-	-	-	-	-	-	**1.38**
18.	Transline Technologies Private Limited	23.36	-	-	-	-	-	-	**23.36**
19.	West Coast Optilinks	2.19	-	-	-	-	-	1.93	**4.12**
20.	VH Securities, MSME		-	-	-	4.30	-	-	**4.30**
21.	Himachal Futuristic Communications Ltd. HFCL	117.59	148.32	-	-	-	-	65.69	**331.60**
22.	Himachal Exicom Ltd.	17.14	-	-	-	-	-	2.27	**19.41**
23.	Matrix Comsec	0.46	-	-	-	-	-	-	**0.46**
24.	Apee Eskay Enterprises Pvt Ltd, New Delhi	-	-	-	-	-	1.03	-	**1.03**

Sl. No.	Vendor	Details of Pending Payments							
		BSNL	USOF BSNL as implementing agency	MTNL	BBNL	TCIL	III	Others*	Total
25.	Tek Components Ltd., Pune MSME	27.96	-	3.80	-	-	-	-	**31.76**
26.	Agmatel, Delhi MSME	15.50	-		-	-	-	-	**15.50**
27.	GAIA SMART CITIES SOLUTIONS PVT LTD	2.23	-	-	-	-	-	-	**2.23**
28.	Sensorise Digital Services Private Limited	-	-	-	-	-	1.05	-	**1.05**
Total		**1,541.65**	**610.32**	**28.89**	**66.17**	**38.23**	**15.06**	**797.69**	**3,098.01**

*** Details Under the Heading Others**

Rs. In Crores

Company	Railway	Other PSU and govt o rganisations	M-SIP	Mahanet	T-Fiber	PGCIL	Kakinada	Outstanding from DOT (indirect)	Total
Sterlite Technologies	1.90	-	129.00	539.00	18.00	15.90	24.00	-	**727.80**
West Coast Optilinks	1.93	-	-	-	-	-	-	-	**1.93**
Himachal Futuristic Communications Ltd.	-	2.27	-	-	-	-	-	63.42	**65.69**
Himachal Exicom Ltd	-	2.27	-	-	-	-	-	-	**2.27**
Total	**3.83**	**4.54**	**129.00**	**539.00**	**18.00**	**15.90**	**24.00**	**63.42**	**797.69**

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Extract of Clause--24.3, Chapter-4 of Unified Service License Agreement

24.2 The Licensee shall adopt Renewable Energy Technologies (RETs) for powering the Telecom Network, deploy energy efficient equipment and reduce the carbon footprint as per prevailing directions/ instructions and shall abide by further directions / instructions as may be issued in this regard by Licensor/ TRAI from time to time.

24.3 The licensee shall adhere to the prevailing directions/ instructions and shall also abide by further directions / instructions as may be issued by LICENSOR from time to time in respect of

(a) Preferential Market Access for procurement of indigenous manufactured products,

(b) Mandatory testing of equipment and

(c) Requirements on IPv6 implementation.

25. The Applicable System:

25.1 In the process of operating the Services, the Licensee shall be responsible for:-

(i) The installation of the systems excluding the installation of the equipment at the subscriber's premises which will be left at the option of the subscriber;

(ii) the proper upkeep and maintenance of the equipment;

(iii) maintaining the criteria of performance;

(iv) maintaining the Quality of Service as per clause-29.

26. Engineering Details:

(a) The Licensee shall furnish to the Licensor or its authorized representative(s), in such manner and at such times as may be required, complete technical details with all calculations for engineering, planning and dimensioning of the system/network, concerned relevant literature, drawings, and installation materials regarding the applicable system.

(b) Licensee shall supply all tools, test instruments and other accessories to the testing party of Licensor and /or TEC for conducting tests at any time during the currency of the License.

27. Network Interconnection:

27.1 Interconnection amongst the networks of Licensees shall take place where specifically provided for in the Service Authorization Chapter in PART-II of the Schedule to the License. In such cases the conditions of interconnections as specified below shall be applicable.

27.2 Transmission links for interconnection shall meet relevant standards or Interface Requirements (IR) issued by TEC from time to time.

27.3 Interconnection between the networks of different Licensees for carrying circuit switched traffic shall be as per national standards of CCS No.7 as amended from time to time by Telecom Engineering Centre (TEC) and also subject to technical feasibility and technical integrity of the Networks and shall be within the overall framework of interconnection regulations/ directions/ orders issued by the TRAI/ Licensor from time to time. For inter-networking between circuit switched and IP based network, the Licensee shall install Media Gateway Switch. Further, the Licensor may direct the LICENSEE to adopt any other technical standards issued by TEC on interconnection related issues.

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Proposal for Incentivising Telecom Service Providers for Purchasing Indigenously Designed, Developed & Manufactured Equipment

1. **Brief Background:** Honourable Prime Minister has launched drive of आत्म-निर्भर भारत and **'Vocal for Local'** for making India a self-reliant nation. The telecom sector is growing at a very fast rate and is an enabler for the economic growth. Further, it is also a technology and capital-intensive sector.

In Indian telecom sector, the major share of wireless subscribers, i.e. 89.36% of the total number of subscribers, are served by the private telecom service providers leaving only 10.64% of subscribers who are served by PSU telecom service providers. Therefore, to be self-reliant in respect of telecom equipment & products, the buying power of the domestic telecom sector dominated by the private service providers needs to be tapped.

Though the Indigenous products get preference in public purchases under PPP-MII orders of DPIIT, Govt. of India, there is no such policy support to either incentivise or mandate private telecom service providers to buy indigenous products. Consequently, due to lack of business, the Indian manufacturers are unable to achieve economies of scale and become globally competitive, in the absence of volumes.

Inspite of availability of the Indigenous products, the private telecom service providers are reluctant to buy the same mainly due to the following reasons:

a. Predatory price offered by the MNCs in general and Chinese companies in specific.

b. Vendor's credit at low interest rates along with a moratorium period of 4-5 years.

c. Further, the cost of Capital, Power, and Infrastructure etc. is higher by 13-15%[25] in comparison with the developed countries; the same also results in the lower prices of telecom equipment/ products manufactured by the MNCs.

Therefore, to be competitive in the domestic as well as international market places, the above handicaps faced by indigenous manufacturers needs to be compensated through sector specific financial incentives.

2. The license fee regime coupled with other levies is possibly one of the highest in the world. To recapitulate while the license fee is only 3%, the Universal Service Obligation Fund contribution is 5%, the spectrum usage charge varies from 1% to 6% depending on the bandwidth being utilised by the service provider. To the best of our knowledge, where spectrum is auctioned, there is no separate spectrum usage charge. In fact, the basic criteria used by most regulatory regime is related to the cost of administration of the relevant regulations. The usage charge was being levied when we migrated during the year 1999 to the revenue sharing regime where instead of auctioning spectrum, need based additional spectrum was being given to the number of subscribers being serviced by a service provider. Therefore, there is a strong case for reducing and rationalising the license fee particularly when we are now auctioning the spectrum. Consequently, there is hardly any justification for imposing spectrum usage charge. This dispensation could be linked to the service provider agreeing to follow the Make in India policy so far as procurement of telecom equipment are concerned.

[25] https://www.ey.com/Publication/vwLUAssets/ey-cost-of-capital-india-survey2017/$FILE/ey-cost-of-capital-india-survey-2017.pdf

3. **Measures for आत्म-निर्भर भारत in respect of Telecom Equipment & Products:** To encourage the Indian telecom operators for using the indigenously designed, developed & manufactured products, and to promote and strengthen the domestic R&D and manufacturing of telecom products, TRAI has also recommended that specific actions need to be taken to promote the growth of the high-value indigenous telecom products. We, therefore, recommend the following specific actions be taken:

a. Incentive to all telecom services providers to buy PPP-MII Compliant Telecom Equipment:

The telecom service provider who buys indigenous products of value X during a given financial year, may be given a credit of 50% of X, to be used against their AGR based levies (3% as annual license fee and 5% towards USOF) that are payable to Government of India. This as an option (not a mandate) that may be made available to the service provider. Given such incentives to buyers will also promote meritocracy, since they will only buy products that meet the technology, quality and price competitiveness benchmarks. The payment of such AGR levies should be deferred by a twenty-four months period, so that they get a buyers credit of 24 months, which foreign vendors are normally offering. The combination of the above recommendations will address both the critical issues - leveraging our domestic market demand and providing long-term financing.

b. Universal Service Obligation Fund (USOF) Projects:

As per existing policy projects, funded by USOF have to mandatorily follow the Make in India policy. This is also applicable where projects are implemented by the private sector and terms & conditions of the tender are required to stipulate this condition. In all USOF funded projects, it must be made mandatory to use only indigenous equipment (i.e. 100% of the telecom equipment shall be used which are domestically designed & manufactured) that are available within the country. Even when such projects are executed by telecom services providers (operators) or system integrators or a state government agency, the requirement to procure only domestic products must be mandated.

c. Creation of R&D Fund by Levying a Cess :

A R&D cess may be levied as a percentage on the AGR of the telecom service providers for promoting indigenous product development within the country. In case the telecom service provider uses the indigenous equipment, the equivalent amount may be deducted from AGR for calculation of the R & D cess. For this purpose, a Telecom Technology Development Board (TTDB) may be constituted (similar to the Technology Development Board under Ministry of Science & Technology) under Telecom Engineering Centre to finance the R&D activities in respect of indigenous telecom equipment/ products as per Para-5.3.2d. Such R&D funding should be extended to private sector companies on a 1:1 matching grant basis, or as advance against future orders.

d. Mandatory use of trusted, domestic products in states that border with certain countries

Finally, using security carveouts, all TSP may be mandated to remove the equipment from certain countries that share land border with India and instead use indigenous equipment, if available. However, in case the required Indian equipment is not available, the TSPs should still replace the equipment from the countries that share land border with India using the equipment from another foreign sources from a country who don't share land borders with India, so that national security is not compromised.

e. Creation of Telecom Finance Corporation for incentivizing buying of indigenous products

On the lines of Indian Railway Finance Corporation and NHAI, infrastructure Investment Trusts (InvIT), a Telecom Finance Corporation/ InvIT may be established, by the Government of India, for telecom sector for providing long term soft loans with certain moratorium period to the telecom service providers who buy the indigenous telecom equipment. A corpus, of sufficient amount, may also be created from the 'Universal Service Obligation Fund (USOF)' to serve the incentive portion of the interest on the debt used for purchasing the indigenously designed & developed Indian telecom products.

f. Production-linked incentive scheme for telecom products, linked to domestic value-addition

Production linked incentives must be given to companies who design and manufacture telecom equipment in the country and do a minimum specified value addition. The %age of incentive should be linked to domestic value addition and not relate to any capital investment, since the main costs for developing high-value addition products is manpower, whereas the manufacturing/ assembly is outsourced to electronics contract manufacturers.

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Non-Tariff Barriers Imposed by Various Countries: The telecom industry has reported Non-Tariff Barriers (NTB) in the following countries, which needs to be addressed:

a. **Brazil:** Since 2004, India has a Preferential Trade Agreement (PTA) with Brazil as part of a framework agreement with MERCOSUR. Ministry of Commerce has prepared a list of 3111 tariff lines for seeking concessions of up to 100% from MERCOSUR but currently the list does not include telecommunication related product lines which should be added. The specific 8-digit NCM codes to be included for full tariff exemption under PTA are:

   i. NCM 8517.61.49/8517.70.91/ 8517.70.10 for TJ1600-xx DWDM products

   ii. NCM 8517.50.41/8517.70.91/ 8517.70.99 for TJ1400-xx GPON products

   iii. NCM 8517.62.59 for Transceivers/ Pluggables

   iv. NCM 8517.62.59 - Ex 045 for Wireless

   MERCOSUR countries like Brazil apply up to 42% import tariff on these tariff lines today. These should be eliminated since India has significant export potential for products that fall within these custom codes. Total margin of preference given to domestic manufactured goods can be up to 25% of the price submitted by the highest ranked foreign proposal. Additional margin of preference in federal "public" purchases for domestic manufactured products arising from development and technological innovation over and above the nominal margin of preference given to other domestic manufactured goods.

b. **Central and Latin America (CALA):** India has signed a PTA agreement with the MERCOSUR trading bloc in CALA. However, MERCOSUR only includes Brazil, Argentina, Uruguay and Paraguay. Similar PTA agreements should be signed with other large CALA countries as well such as Mexico, Colombia, Peru, Bolivia, Chile having a large telecom markets.

c. **Middle East and North Africa (MENA):** Several countries in the MENA region impose special country of origin requirements in their public sector procurements. For example, Egypt, Iraq, KSA, UAE, Azerbaijan mandate EU or USA or Japan origin products in their utility tenders (energy, oil and gas) thus precluding Indian exporters from the bidding process. Significant local content requirements are also mandated in many cases.

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