Cisco Systems (India) Pvt. Limited
First Floor, RMZ Infinity, Plot No 15
Phase IV, Udyog Vihar
Gurugram, Haryana 122015
Tel : 9810139546 Fax : 91-124-4402007
Email : harkris2@cisco.com

Harish Krishnan
Managing Director,
Public Affairs & Strategic Engagements,
India & SAARC

Shri Sunil Kumar Singhal
Advisor
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi – 110002

Dated: 19-Jan 2018

Dear Sir,

Sub: Cisco Response to TRAI Consultation Paper on Inputs for Formulation of National Telecom Policy – 2018

At the outset, we would like to thank TRAI for this important step of a comprehensive consultation on various aspects of National Telecom Policy-2018.

We at Cisco welcome this opportunity and are providing inputs based on our experience as a technology leader and telecom partner for core networking, communication and security products and solutions. We have focused on issues that will enable the stated objectives in the new National Telecom Policy.

Please find enclosed our detailed submission along with Annexures on TRAI consultation paper.

Look forward to your kind consideration of our inputs and opportunity to discuss further.

Thank You.

Best Regards,

Harish Krishnan

Cisco Response to TRAI Consultation Paper on Inputs for Formulation of National Telecom Policy – 2018

Q.1: Stakeholders are requested to give their comments on structure and contents of the proposed inputs for National Telecom Policy, 2018, clearly outlining the specifics along with justification.

Response:

We would like to comment on the following sections of the TRAI Consultation paper:

CHAPTER-II: STRUCTURE OF POLICY FRAMEWORK

D. Common Strategies to leapfrog India amongst top-50 nations in international rankings in terms of network readiness, communications systems and services, to attract an investment of USD 100 billion in telecommunication sector, and to attain average speed of 20 Mbps for wireless and 50 Mbps for wireline internet connectivity:

1. **(g) By easing grant of licenses/ permissions processes for spectrum, wireless apparatus, and SACFA clearance to improve efficiency, innovation, and research;**

i) We request TRAI to elaborate on the above point by including the strategy for a "shift to online processes". Electronic document management and submission is highly needed to achieve the government's stated policy objective of achieving ease of business. A complete shift from manual hard copy submissions to online is needed for achieving comprehensive benefits in terms of faster turnaround times, ease of tracking, transparency and overall efficiency.

ii) Secondly, we would like to highlight the need for easing grant of licenses/ permissions for Other Service Providers as well. There is an urgent need to simplify multiple redundant requirements in OSP licenses such as need for location-based bank guarantee and document submission, and prohibitive work-for-home provisions. A detailed note is given in **Annexure 1** for reference.

We request that this point mentions Other Service Providers as well.

Hence, we suggest that the recommendation D. (g) be modified to "By easing **and making online** grant of licenses/ permissions processes for spectrum, wireless apparatus, **other service providers** and SACFA clearance to improve efficiency, innovation, and research;"

2. We also suggest adding the following strategy – 'by creating a policy framework for enabling and securing critical infrastructure, including communication infrastructure for smart cities.'

Smart Cities:
Smart city infrastructures are critical from a safety and service delivery perspective, and have to be secured from any disruption on the public infrastructures. The policy should address securing these smart city networks from any public network disruption, either by mandating separate networks or laying down the requirements for security.
The Policy should also clearly articulate any licencing conditions for providing services through the smart city networks (eg WiFi Internet access to subscribers), and providing logically separate secure infrastructures for the various entities using the smart city network.
National Critical Infrastructure:
There could be multiple areas where IoT would play a role, in connecting devices across multiple critical installations related to national interest, and public safety and security. The policy should aim to laydown requirements for such networks, and clearly isolate them from any public infrastructure.

G. Strategies to enable access for connecting to 10 billion IoT/ M2M sensors/ devices:

We suggest TRAI to add a policy statement to this section – "enable a policy framework for network scaling that helps in connection of billions of new devices".

Reasons for policy framework for Network Scaling:
IP Addressing is critical for scaling the networks and adding more users to the network. Although there are guidelines to interoperate networks to with the IPv6 networks, there is no clear path to migrate to existing networks to IPv6. The policy needs to articulate and promote the migration to IPV6 networks that would allow the interconnection of millions of IPv6 devices on the network, that are foreseen in light of IoT, M2M and the digitization wave in the country.
The limitation of the number of IPv4 addresses has led to multiple networks adopting techniques like Network Address Translations (NAT) that require huge overheads in terms

of operational expenses, and even lawful interception, and logging. Further, the policy in its existing form allows only for NAT logs from stateful means to be supplied by the Service Providers, while other more scalable technologies like MAP-T that scale much better, are not permissible.
It is suggested to relook at the NAT requirements, and guidelines in the new policy in light of new technologies and expected devices to be connected to the networks.

I. Strategies to become net positive in international trade of telecommunication systems and services:

(h) By incentivising local manufacturing of network equipment and devices;

We request TRAI to elaborate on above recommendation by stating the following – "By incentivising local manufacturing of network equipment and devices **for exports and domestic markets for Indian and Global manufacturers**".
It is essential that for Indian manufacturing policy to succeed, an equal impetus is given to manufacturing for exports as well as for local markets. It is worth noting that India's Domestic Demand for electronic goods was approximately $64 billion in 2014-15. In comparison, the world market in 2014 was $2 trillion. The need for large market and scale directly translates into the necessity for providing incentives not just for producing for domestic markets but for exports as well.
Also, global MNC OEMs and Indian OEMs and component suppliers will have to work together to achieve the larger 'Make in India' objective, create a win-win partnership and simultaneously generate substantial number of jobs and build capability in the country. This could only be achieved through an export-oriented strategy where global and Indian companies work together create a self-sustaining eco-system ranging from products to components.
Please find our detailed inputs illustrating the rationale in **Annexure 2,** which is the response we submitted to TRAI Consultation Paper on Manufacturing.

(k) By making TEC and TSDSI responsible for development and enforcement of standards for telecom products and services;

We request TRAI to also specify that TEC and TSDSI should "increase participation in international standard development process." It is important that Indian agencies contribute to international standard-making rather than just working on national standards. This will enable India to become an equal beneficiary of global innovation/ standards and provide an opportunity for Indian manufacturers to participate in global markets.

Q.2: Stakeholders may also suggest any other issue related to Policy Framework which stakeholders feel is important for growth of telecom sector, along with justification.

Response:

We are particularly encouraged by TRAI's mission statements and objectives, including the goals of establishing "India as a global hub for internet and data communication systems and services in a net-neutral environment" and leapfrogging "India amongst the top-50 nations in international rankings in terms of network readiness, communications systems, and services." TRAI recognizes further that a critical component of reaching those goals is "restructuring . . . legal, licensing and regulatory frameworks for reaping the benefits of convergence." We would like to raise the following important issue for growth of innovative telecom services.

Issue:
<u>Current policy of not allowing IP-PSTN mixing undermines growth and innovation and prohibits India from reaping the full benefits of convergence.</u>

Government of India prohibits any mixing between PSTN endpoints and IP endpoints, except in relatively narrow cases subject to licensing requirements. The policy, created originally to combat toll bypass and advance innovation, now produces the opposite result of undermining TRAI's core goal of propelling "India to become the front-runner in the Fourth Industrial Revolution."

Reasons for allowing IP-PSTN mixing:

a. Innovative, converged services mix IP and PSTN streams

A wide array of innovative offerings often depend on enabling IP and PSTN endpoints simultaneously, particularly in order to extract maximum benefits. A good example of this is collaborative videoconferencing, where multiple end users join a single meeting in which they meet via video, chat via electronic message, and work on documents and virtual whiteboards in real time. For a variety of reasons, including bandwidth limits for some users and physical equipment limitations for others, many participants connect their audio to the meeting via PSTN endpoints, while many others connect directly via IP from laptops and smartphones. Prohibiting IP-PSTN mixing vastly limits the reach and effectiveness of this kind of collaboration service.

The prohibition also impacts many Internet-of-Things services. While the core of most IOT services rests on machine-to-machine communications, many applications include a communication layer that enables factory managers or other observers to interact with each other in real time based on the data the IT service delivers. As with collaboration services, this capability is most valuable when it is open to all end users, including those that do not have ready access to an IP endpoint.

There is little doubt that the IP-PSTN barrier will impact a wide array of innovative services that are still on the drawing board. These include applications ranging from connected homes, to connected classrooms, to healthcare, and to autonomous vehicles. The future scale of the potential impact is immense.

b. The IP-PSTN barrier drive away innovators

For the reasons discussed above, India's current IP-PSTN barrier poses a significant challenge to the innovators developing these services and to the consumers and enterprises that use them. This impacts Indian consumers and enterprises directly, as they are often forced to use significantly pared back versions of the services. It also impacts India more broadly and more indirectly, as service providers and innovators will increasingly consider developing and testing new advanced services in other countries.

c. The barrier is not aligned with global technological convergence

While different transmission technologies were once distinct in their capabilities and uses, they are now virtually interchangeable. Indeed, TRAI's Consultation Paper recognizes the positive changes in access and opportunity that convergence delivers. The IP-PSTN barrier reinforces a distinction that is no longer applicable to advanced technologies; the result is that Indian consumers are not getting the full benefits of technological possibilities as in other countries that allow IP-PSTN mixing.

d. Removing the barrier will allow advanced telecom services to flourish

For these reasons, we urge TRAI to reconsider the prohibition. While it may have served a valid purpose when first crafted, it is now a barrier to India's advancement as a world leader in advanced communications technologies.

Suggestions:

While eliminating the barrier altogether would be the most effective approach, we request that TRAI considers narrowing its scope of applicability in the first stage. At

present, the barrier is almost total, prohibiting IP-PSTN mixing in virtually any context (except for rare applications which anyway require licensing or authorization). To the extent the original purpose was to address toll bypass, TRAI could consider applying the barrier only to point-to-point voice calls because they are the communications most directly responsible for toll bypass losses. Limiting the prohibition to point-to-point calling – but freeing IP-PSTN mixing in other contexts – would allow innovative collaboration and IOT offerings to thrive in India, securing its place as a world leader in tech innovation.

We also suggest that TRAI add a point of "removing policy barriers to innovative telecom solutions and services" under Chapter II Section D on Common Strategies.

ANNEXURE 1

Simplification requirement in OSP License Provisions

ISSUES:

1. **Need to change Location-based OSP licensing and Bank-Guarantee to Company-based licensing and Bank-Guarantee**

Current Challenges:

- Submission of same documentation for each new location(site) and also online and offline
- Inconsistencies with the requirements between the Term Cells.
- Certain regulations are open to interpretation and the officers understanding of telephony.
- Duplication of documentation – submitting multiple signed documents and application on line and then again in hard copy. This is exceedingly cumbersome and time-taking.

Impact: Huge delay, unnecessary cost and uncertainty in getting OSP licenses

Proposed Solution:

We request change in the OSP Terms to allow Company-based Licensing and Bank-Guarantee. Locations (sites) and their related documents could be updated with DoT at the time of submission of annual reports.

2. **Need to urgently simplify the Work-From-Home provisions in OSP License Terms**

Current Challenges:

The OSP Terms require a) individual leased lines from company premises to employee home; and b) submit amendments to licenses; before support engineers are allowed to work from home. New License are required in this case per function/ location. This means for 30 engineers in a particular contact-center, there need to be 30 leased lines. This is a huge cost and impractical, also consider that employees move houses frequently. Such requirement is unique to India.

Impact:

- Such prohibitive restrictions make BCP (Business Continuity Planning) and DR (Disaster Recovery) more difficult as there not always extra buildings (i.e. Licensed sites) to go to, if it is possible to travel.
- Many natural disasters make travel to work impossible (ex.– Mumbai rains/ Chennai flooding) and result in significant business disruption for our customers. A feasible work-from-home option would be of enormous help to the industry.

- Since the current work-from-home option of a direct leased line is impractical and very expensive; MNCs operating in India are also thinking about re-locating contact-center operations from India to other countries (ex. – Eastern Europe and South America) which could result in significant number of job losses.

Proposed Solution:

We request relaxation of the regulation for the need for individual leased lines for home working capabilities and allow option of technologies such as Virtual Office with an always-on, secure connection to the corporate network.

ANNEXURE 2

CISCO Response:

TRAI Consultation Paper on Promoting Local Telecom Equipment Manufacturing 18-Sep 2017

It is important to understand the telecom equipment landscape before we examine the various manufacturing issues in detail. We want to highlight that Telecom products market is comprised of several segments – from high-volume handsets and peripherals to low-volume networking/ datacom products. Each product segment has different drivers for a manufacturing location strategy. The issues and challenges for each of these segments need to be addressed to evolve a holistic telecom manufacturing policy roadmap.

For the purposes of this consultation and keeping in mind Cisco's area of expertise, we have limited our response to the high-complexity, low-volume active enterprise telecom equipment such as routers, switches.

We also want to highlight the importance of integrating India into the global supply chain eco-system to gain larger global market share with sufficient scale to make domestic telecom manufacturing a job-creating engine of Indian economy.

The need for large market and scale directly translates into the necessity for increased focus on an **India for the World strategy** for telecom manufacturing instead of just relying only on an India for India strategy.

Consequently, keeping an India for the World strategy at the front and centre of pragmatic policy making - a judicious combination of incentives and market access measures need to be provided to both domestic firms and large MNC manufacturers to thrive and create a self-sustainable eco-system that can grow exponentially in India. The key constituents in the form of talent and competitive labour are already present in India, all that is needed is the right policy mix.

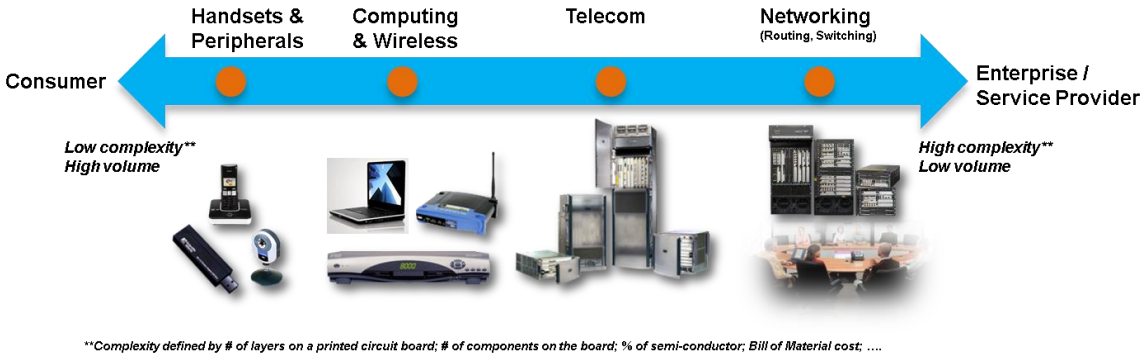
Question 1. Large number of initiatives have been taken by the government to promote electronics manufacturing, while these initiatives have succeeded in attracting significant investments in other sectors like LED, consumer electronics, mobile handsets, automotive

electronics etc., they have failed to attract investments in telecom equipment sector e.g. PMA has worked very effectively in LED sector but did not work so effectively in telecom. Please enumerate the reasons with justifications for the poor performance of local telecom manufacturing industry inspite of numerous initiatives by the government/industry.

Question 2. What policy measures are required to be instituted to boost Innovation and productivity of local Telecom manufacturing in our country? Please provide details in terms of Short-Term, Medium-Term and Long-Term objectives.

We intend to address both these questions together here.

Electronics industry can be decomposed into following spectrum addressing specific industry verticals:



Generally speaking, **consumer products are easier to localize**. Given the high volume and low complexity of such consumer products, one can find more examples of consumer electronics being localized. The manufacturing footprint strategy for consumer products is hinged upon:

- Lowest operating cost – labor, freight, facilities, electricity, etc.
- Proximity to customer base

On the other end of the spectrum are products procured by Enterprise & Service Providers. The **manufacturing for Enterprise / Service Provider products can be characterized as high complexity and low volume.** The manufacturing footprint strategy for Enterprise / Service Provider products is hinged upon:

- Operating cost in balance with operating capabilities – industry maturity; technical talent; new product introduction capabilities; etc.
- Proximity to key suppliers & key customers – esp. for smooth product launches and transitions

Due to high complexity in enterprise telecom manufacturing, it is imperative for companies to establish manufacturing at global locations that can cater to as large a market as possible to achieve economies of scale by maximising volumes. This will also help create a pull-effect for the local component eco-system.

The need for large market and scale directly translates into the necessity for increased focus on an **India for the World strategy** for telecom manufacturing instead of relying only on an India for India strategy. To put the rationale for India for the World strategy in perspective, it is worth noting that India's Domestic Demand for electronic goods was approximately $64 billion in 2014-15. In comparison, the world market in 2014 was $2 trillion.

Following is a table high-lighting the impediments to production scale-up and growth of manufacturing, specially for exports:

	What's stopping exports from India (India vis-à-vis global nodes)	**Characterization**
1	Landed cost parity	~5% landed cost disadvantage • 3% in-bound freight • Conversion cost: At par, with global nodes 2% outbound freight disadvantage
2	PMA implementation	i) Unachievable value-add thresholds for Active Telecom Products - Need to align value-add norms to realistic targets ii) Applies to all products/ models – no consideration for portfolio approach
3	Component ecosystem	Barring few low-end commodities (sheet metals, plastics, wires, …) ecosystem is almost non-existent – Passives Electro-Mechanical Inter-Connectors can be the focus
4	Ease of Doing Business	• Logistics / infra • Tax certainty ….

Elaborating on the Challenges for growth of manufacturing and exports -

1. **Landed cost-parity:** There is about **5% cost differential** in manufacturing in India for Exports.

   There is a cost disparity of exports of India vis-à-vis existing global nodes (e.g. Malaysia, China).

	Landed cost element	**India vs. China / Malaysia / Thailand** (May 2016)
a)	Bill of Material (BoM)	⟷ India comparable • Global pricing list Global pricing for components

	Landed cost element	**India vs. China / Malaysia / Thailand** (May 2016)
b)	Inbound freight for shipping components into India factory	↓ 3% unfavorable (Sized as 3% of Bill of Material cost) Compared to global/regional benchmarks, India is farther away from component factories and the shipping rates are more expensive due to lower volume flowing into India specific transportation lanes vs. the ones going to "mega factories" in Malaysia, Thailand, Mexico, ….
c)	Transformation cost / Conversion (raw material into finished goods)	↔ India comparable India factory lack scale compared to China factories; Advantageous labor rates in India are offset by fully burdened cost of facilities & electricity
d)	Outbound freight for shipping out finished goods	↓ 2% unfavorable (Sized as 2% of Bill of Material cost) Due to low export volumes compared to global benchmarks, the logistics rates are slightly higher. Higher exports volume is needed to offset.

This cost disparity needs to be addressed for India for the World strategy to be successful.

2. PMA Implementation

i) Unachievable Value Addition Norms for active Enterprise Telecom Products:

A. Challenges

✓ The PMA policy, in general, prescribes the following conditions for the government departments for procurement of electronic goods:

- Specified percentage of procurements from domestically manufactured goods
- 25% to 50%+ of the BOM is made of domestically manufactured goods
- Automatic increase of 5% on domestic value addition from year 2 onwards
- Requirement of complete local manufacturing for certain products from year 3 onwards

However, given the industry infancy, the component supply base is practically non-existent in India. Illustrating the BOM table for a set-top box for reference –

An ILLUSTRATIVE Set To Box Bill of Material (BoM)

	Commodity category	Component	Suppliers (incl. global leaders)	Present in India – Y/N	Indicative Sizing
1	Plastics & mechanicals	•Mechanical fabrication (base cover, sheet metal, …) •Plastic fabrication •Cables / wires	•Flextronics, Supreme •Rosti, G-Plast, Nypro •Amphenol, Molex, FCI, Volex	•Y •Y •Y •Y	15% of costed BoM
2	Electro-mechanical (elect.+ specialty)	•Caps & Resistors (thru-hole) •Heat sinks •Batteries & power supplies •Connectors •Printed Circuit Brd. (2-4 lyrs)	•Vishay •Auto ancillary (e.g. Jindal extruders) •Laird Tech, Murata •Tyco, Molex, FCI, Amphenol •AT&S, Epitome, Ascent	•Y •Y •Y •Y •Y	
		•Caps & resistors (SMT) •Inductors & magnetics	•Belfuse, Delta, Lineage, Panasonic •Delta, Jan Mao	•N •N	5 % of costed BoM
3	Semi-conductor (aka Silicon)	•Communications module •Diodes •Linear Voltage Regulator •Logic, Memory •Chipsets; Logic devices •Timing devices •Transistor	•Broadcom, Marvell, Maxim •Diodes Inc, Fairchild, ST Micro, … •Maxim, TI, National Semi, Linear Tec. •NXP, Hynix, Samsung, Fairchild, TI •Freescale, Fairchild, Broadcom, PMC •Maxim, Pericom, Kyocera, Analog •Fairchild, Central Semiconductor	N	80% of costed BoM

- ✓ Apart from the plastics, electro-mechanicals and inter-connectors (PEMIC) that contribute only about 15% to Bill of Materials (BoM) for some of the low value products, there is no presence of specialty electronics and semi-conductor products which contribute about 80% to BoM. The current system of computing value addition for PMA or every product may not be feasible as the prescribed levels of value addition may not be achievable given the depth and breadth of manufacturing in India.

- ✓ The current PMA qualification threshold will constrain the major electronics manufacturers from qualifying for the PMA. Existing global supply agreements with significant existing investments in supply-chain and yet to develop local electronics supply & manufacturing ecosystem, make the current PMA value addition norms un-achievable for any manufacturer seeking to make serious investment.

ii) Lack of portfolio approach in PMA implementation

Challenges

- ✓ The PMA policy prescribes domestic manufacturing criteria at a 'product' level. Currently manufacturing all the products in India may not be feasible or possible from a technology, infrastructure and commercial parameter for any investor or manufacturer willing to Make in India.

- ✓ Global supply chain implies that no site manufactures the entire portfolio of products and only a set of products are manufactured at each facility based on defined parameters

- ✓ Evolution of the supply-chain & manufacturing eco-system in mature countries allude to the fact that products with high-end technology, complex manufacturing processes and low volume would continue to be imported until the required supply and manufacturing ecosystem is developed and fully evolved to support local manufacture of such hi-end products and demand growth makes manufacturing viable.

Suggestions for growth of active Enterprise Telecom Product Manufacturing

The suggestions are further elaborated below:

1. **Removal of cost-disparity for exports**

   There is a need to offset the cost-disparity in exports from India. The specific interventions need to be deliberated with the government-industry consultation and implemented in the immediate term.

2. **Link PMA to Exports and rationalize local value-addition norms**

- ✓ Revising the PMA policy by a) incorporating the substantial transformation rules for value-addition as per global norms and b) providing deemed domestic manufacturing credits i.e. allowing $ for $ to qualify for PMA in lieu of exports.

  a) Incorporating substantial transformation rules

  Current PMA value-add norms are only based on Bill-of-Material (BOM)%.
  This needs to revised along the globally accepted norms of substantial transformation.

  The Substantial transformation norms for the purpose of this policy are following globally accepted stages and can be physically verified on inspection:

  (i) Stage 1: Final Assembly & Test (FA&T);
  (ii) Stage 2: Printed Circuit Board Assembly (PCBA); and
  (iii) Stage 3: Local sourcing of components (based on cost, delivery, quality parity).

b) Providing Deemed Domestic Manufacturing Credits

An export-oriented strategy would focus on achieving large volume for certain products. The larger volumes from the factory based on exports, generate jobs & create ecosystem. However, manufacturing the entire portfolio of an OEM's products would never make economic sense based on India volumes alone.

The Government needs to incentivise such Manufacturers exporting from India. We suggest that DoT adds to the PMA policy a framework for allowing hi-tech companies to sell under PMA based on the total portfolio volume being manufactured out of the India factory – both domestic & exports.

The Original Equipment Manufacturers ("OEMS") should be granted a deemed domestic manufacturing credit for 100% of their manufacturing volume – independent of product, export / domestic consumption. The credit can be used for supply of imported portfolio products against PMA contracts.

Question 3. Are the existing patent laws in India sufficient to address the issues of local manufacturers? If No, then suggest the measures to be adopted and amendments that need to be incorporated for supporting the local telecom manufacturing industry.

Patent laws and promotion of manufacturing are separate issues with different drivers and should not be conflated.

It should also be noted that lack of IP creation has not been a limiting factor in countries becoming a manufacturing hub. Ex. – Vietnam, Thailand, etc.

Several large global organisations have made India the home for their R&D and design which can spur the local eco-system and local companies. This investment in local talent, capability build-up for R&D and design should be promoted further

Moreover, in a global company, a product IP is comprised of several components and developed through collaboration of multiple teams in multiple geographies. It may thus be impractical for a MNC to have IP resident in India. <u>But it is important to encourage MNCs to spur investment in R&D capability in India by giving incentives such as PMA credits based on employees/ turnover of their R&D centres.</u>

Question 4. Is the existing mechanism of Standardisation, Certification and Testing of Telecom Equipment adequate to support the local telecom manufacturing? If not, then please list out the short-comings and suggest a framework for Standardisation, Certification and Testing of Telecom Equipment.

Again quoting from the Niti Aayog's Manufacturing paper (May2016) - "Before we rush to forcing our standards in the domestic market, we need to create a business-friendly ecosystem and grow larger. Premature adoption of standards can scuttle the growth of the industry prematurely. One way to see this is to ask whether the adoption and enforcement of a local standard in mobile telephony in the early 2000s would have permitted the phenomenal expansion of mobile phones that we saw in the last decade."

It is critical that for an **India for the World** strategy to succeed, Indian standards, certification and testing mechanism are harmonised with global standards and best practices. Otherwise, standard-setting in siloes will hamper the growth of Indian Telecom Manufacturing.

Furthermore, it is important that government incentivises setting up a good testing lab infrastructure in the country which are capable of certifying to international standards and practices. STQC-International Common Criteria Certification Scheme is one such example where India can grant international Common Criteria certificates on security aspects.

Sometimes, security is cited as the primary reason for need of local testing and certification. It is worth noting that a global MNC like Cisco is responsible for end-to-end supply chain security independent of the location of manufacturing of product/ components.

For reference, in the below typical model of a Cisco supply chain, our rigorous approach assures security by making use of three foundational elements:

- Physical Security Practices – physical aspects of security such as camera monitoring, security checkpoints, locking devices, alarms, electronic access control etc.;

- Logical Security Processes – systematic, repeatable and auditable security processes designed to target areas of security risk and close them. E.g. ensuring that data is transmission via dedicated lines and/or uses encryption, establishing and validating adherence to scrap handling processes, mandating certifications of production and destruction of key counterfeit protection labels etc.; and

- Security Technology – applying technological innovation to enhance counterfeit detection, terminate functionality or identify a non-authorized component or user. Smart chips, data extracting test beds, and proprietary holographic security labels are a few of the technological innovations that we use in our supply chain security.

Question 5. Please suggest a dispute resolution mechanism for determination of royalty distribution on FRAND (Fair Reasonable and Non Discriminatory) basis.

Disputes regarding SEP valuation between licensors and licensees are frequent, and one of the reasons is the absence of an agreed methodology for valuing SEPs (determining what royalty rates are consistent with the commitment patentees voluntarily assume to grant FRAND licenses). With rare exceptions (the IEEE-SA patent policy text revision in 2015), industry efforts to devise such a methodology have been hampered by the desires of companies with business models based on patent licensing to maximize the value of their SEP portfolios.

We also agree that rules that specify that SEP licensing happen at the level of the smallest saleable patent practicing unit (referred to in the TRAI paper as SSPPC) would be helpful in vindicating the principle that a FRAND commitment means that any implementer of a standard must be licensed to the patented inventions that it implements. Better information about what patents are essential to standards would be helpful, especially in light of widespread over-declaration of patents to ETSI / 3GPP in particular, many of which turn out, when tested in litigation, to be non-essential. The use of NDAs by licensors to cloak licensing practices that are discriminatory is a concern, considering the Non-Discriminatory nature of FRAND.

As to a dispute resolution mechanism, there is no substitute for a well-functioning court system that is empowered to interpret the FRAND commitment and to take evidence regarding the value of particular patents. While the parties should be free to agree to arbitration of SEP disputes, that choice should not be forced upon them.

Q.6 Are the current fiscal incentives sufficient to promote the local telecom manufacturing? Please suggest the fiscal incentives required to be instituted along with the suitable mechanism for implementation of these incentives?

1) There is an urgent need to correct the Cost disparity of about 5% for exports for an India for the World manufacturing strategy to succeed through relevant interventions.

   Reiterating the reasons for the disparity below –

	Landed cost element	**India vs. China / Malaysia / Thailand** (May 2016)
a)	Bill of Material (BoM)	⟷ India comparable • Global pricing list Global pricing for components
b)	Inbound freight for shipping components into India factory	↓ 3% unfavorable (Sized as 3% of Bill of Material cost) Compared to global/regional benchmarks, India is farther away from component factories and the shipping rates are more expensive due to lower volume flowing into India specific transportation lanes vs. the ones going to "mega factories" in Malaysia, Thailand, Mexico, ….
c)	Transformation cost / Conversion (raw material into finished goods)	⟷ India comparable India factory lack scale compared to China factories; Advantageous labor rates in India are offset by fully burdened cost of facilities & electricity
d)	Outbound freight for shipping out finished goods	↓ 2% unfavorable (Sized as 2% of Bill of Material cost) Due to low export volumes compared to global benchmarks, the logistics rates are slightly higher. Higher exports volume is needed to offset.

   This cost-disparity needs to be removed for an export-strategy to succeed.

2) Another fiscal incentive that will make large scale manufacturing in India viable is the reduction in import duties on components to zero.

Q.7 Are there any issues under ITA which need to be addressed for making the local Telecom Manufacturing more competitive and robust

The ITA not only removes tariffs on a vast array of technology products – it also promotes innovation, accelerates productivity, creates new jobs, lowers consumer prices and provides unfettered access to best-of-the-breed technology.

Hence, India needs to remain committed to ITA principles while undertaking measures to promote local telecom manufacturing.

Q.8 Should an export oriented/promotion approach be adopted in the telecom equipment manufacturing sector? If yes, Please suggest the steps to be taken to create suitable environment to attract foreign investment players for setting up establishments which in turn can result in technology dissemination, innovation, generation of jobs, skilled labour force, etc.?

Yes, an export-oriented strategy is essential for the high-end telecom manufacturing sector to achieve the necessary volumes to be globally competitive, thereby creating larger number of jobs, building capabilities within the country and creating pull for local component suppliers to establish and grow.

There is a Unique value-addition of advanced global telecom manufacturing coming into the country. The co-location of R&D and high-tech manufacturing leads to a fly-wheel effect, resulting in faster product development and accelerated time-to-market. This builds the eco-system and achieves self-sustainable continuous growth.

Niti Aayog's Manufacturing paper also points out that ".. import substitution is unlikely to lead to rapid enough expansion of our electronic industry. If we want rapid transformation, we must adopt an export-oriented strategy and work towards creating an ecosystem in which the industry can be globally competitive without import protection."

The rationale for the importance of an **India for the World strategy** at the front and centre of policy-making have been detailed in Answers to Question 1 and 2 above which is reiterated below:

> Due to high complexity in enterprise telecom manufacturing, it is imperative for companies to establish manufacturing at global locations that can cater to as large a market as possible to achieve economies of scale by maximising volumes.
>
> The need for large market and scale directly translates into the necessity for increased focus on an **India for the World strategy** for telecom manufacturing instead of relying only on an India for India strategy. To put the rationale for India for the World strategy in perspective, it is worth noting that India's Domestic Demand for electronic goods was approximately $64 billion in 2014-15. In comparison, the world market in 2014 was $2 trillion.
>
> Consequently, keeping an India for the World strategy at the front and centre of pragmatic policy making – enabling cost parity and market-access measures (such as

PMA-G) need to be used in a judicious combination to provide the required stimulus for both domestic and foreign-owned manufacturers to exponentially increase production in the country.

The increased production volumes through exports and simultaneous capability build-up will have added benefit of opportunities for component manufacturers and suppliers to local factories. This in-turn will create a fly-wheel effect for sustaining and growing the entire manufacturing eco-system.

Q.9 Does the existing PMA policy require any change? If yes, then please provide complete details with justifications.

We present a high-level overview of the current challenges in the PMA faced by the ESDM sector and potential solutions/enablers:

I. Unachievable High Value Addition Norms:

B. Challenges

✓ The PMA policy, in general, prescribes the following conditions for the government departments for procurement of electronic goods:

- Specified percentage of procurements from domestically manufactured goods
- 25% to 50%+ of the BOM is made of domestically manufactured goods
- Automatic increase of 5% on domestic value addition from year 2 onwards
- Requirement of complete local manufacturing for certain products from year 3 onwards

However, given the industry infancy, the component supply base is practically non-existent in India. See below illustrative BOM table for a set-top box for reference -

An ILLUSTRATIVE Set To Box Bill of Material (BoM)

	Commodity category	Component	Suppliers (incl. global leaders)	Present in India – Y/N	Indicative Sizing
1	Plastics & mechanicals	•Mechanical fabrication (base cover, sheet metal, …) •Plastic fabrication •Cables / wires	•Flextronics, Supreme •Rosti, G-Plast, Nypro •Amphenol, Molex, FCI, Volex	•Y •Y •Y •Y	15% of costed BoM
2	Electro-mechanical (elect.+ specialty)	•Caps & Resistors (thru-hole) •Heat sinks •Batteries & power supplies •Connectors •Printed Circuit Brd. (2-4 lyrs)	•Vishay •Auto ancillary (e.g. Jindal extruders) •Laird Tech, Murata •Tyco, Molex, FCI, Amphenol •AT&S, Epitome, Ascent	•Y •Y •Y •Y •Y	
		•Caps & resistors (SMT) •Inductors & magnetics	•Belfuse, Delta, Lineage, Panasonic •Delta, Jan Mao	•N •N	5 % of costed BoM
3	Semi-conductor (aka Silicon)	•Communications module •Diodes •Linear Voltage Regulator •Logic, Memory •Chipsets; Logic devices •Timing devices •Transistor	•Broadcom, Marvell, Maxim •Diodes Inc, Fairchild, ST Micro, … •Maxim, TI, National Semi, Linear Tec. •NXP, Hynix, Samsung, Fairchild, TI •Freescale, Fairchild, Broadcom, PMC •Maxim, Pericom, Kyocera, Analog •Fairchild, Central Semiconductor	N	80% of costed BoM

- ✓ Apart from the plastics & mechanicals and electro-mechanical components that contribute only about 15% to Bill of Materials (BoM) for some of the low value products, there is no presence of specialty electronics and semi-conductor products which contribute about 80% to BoM. The current system of computing value addition for PMA or every product may not be feasible as the prescribed levels of value addition may not be achievable given the depth and breadth of manufacturing in India.

- ✓ The current PMA qualification threshold will constrain the major electronics manufacturers from qualifying for the PMA. Existing global supply agreements with significant existing investments in supply-chain and yet to develop local ESDM supply & manufacturing ecosystem, make the current PMA value addition norms un-achievable for any manufacturer seeking to make serious investment.

The following suggestions would assist supporting India Manufacturing:

C. Enablers:

- ✓ Revising the policy of PMA-G by incorporating the substantial transformation rules for value-addition as per global norms and deemed domestic manufacturing credits i.e. Allowing $ for $ to qualify for PMA-G in lieu of exports.

- ✓ Aligning value-add to the concept of substantial transformation through operational steps of technology assembly basis the stage of eco-system development. The

Substantial transformation norm for the purpose of this policy would mean:

- Goods transformed through final assembly and testing. PMA preference to be provided to companies achieving these stages.

- The OEM commits to develop the manufacturing process over the following three stages spread over a period of 5-15 years dependent on the evolution and maturity of the ESDM ecosystem.
  - (iv) Stage 1: Final Assembly & Test (FA&T);
  - (v) Stage 2: Printed Circuit Board Assembly (PCBA); and
  - (vi) Stage 3: Local sourcing of components (based on cost, delivery, quality parity).

II. Manufacture of select portfolio in India and Import of other products

A. Challenges

- ✓ The PMA policy prescribes domestic manufacturing criteria at a 'product' level. Currently manufacturing all the products in India may not be feasible or possible from a technology, infrastructure and commercial parameter for any investor or manufacturer willing to Make in India.

- ✓ Global supply chain implies that no site manufactures the entire portfolio of products and only a set of products are manufactured at each facility based on defined parameters

- ✓ Evolution of the supply-chain & manufacturing eco-system in mature countries allude to the fact that products with very high end technology, complex manufacturing processes and low volume would continue to be imported until the required supply and manufacturing ecosystem is developed and fully evolved to support local manufacture of such hi-end products and demand growth makes manufacturing viable.

The following suggestions would assist supporting India Manufacturing:

B. Enablers

The product portfolio & technology composition, domestic & global demand, existing global manufacturing base, stage of evolution of the domestic manufacturing ecosystem, global access & export feasibility etc. are factors that would determine the eligible share of product portfolio that can be manufactured in India and those which would have to be imported into India.

- Government of India ("GoI") to take note of the fact that all the products prescribed for PMA may not be feasible to be sourced from the domestic Indian market given the technological, infrastructural and commercial constraints.
- The Original Equipment Manufacturers ("OEMS") should be granted a deemed domestic manufacturing credit for 100% of their manufacturing volume – independent of product, export / domestic consumption. The credit can be used for supply of imported portfolio products against PMA contracts.

Q.10 Any other relevant issues that needs to be addressed to encourage local telecom manufacturing in our country.

Ease-of-business climate in the country is a big limiting factor in decision-making by large manufacturers to enter India. While the government has taken substantial measures to provide fast-tracking and ease-of-business for companies looking to invest in the country, similar focus and urgency is needed to resolve day-to-day operational issues companies face while dealing with the Government.

Some of these issues are –

1) Manual paper-based government processes, yet to move to completely on-line mode. Where even on-line eGovernance systems are implemented, there are often duplicate manual processes still existing.
2) Tax certainty.
3) Infrastructure constraints such as availability and quality of power. Unreliable power leads to fall-back on diesel gensets which is inefficient.