



Telecom Regulatory Authority of India



Consultation Paper

on

“Promoting Local Manufacturing in the Television Broadcasting Sector”

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Comments on the consultation paper are invited from the stakeholders by 19th January 2022. Counter-comments, if any, may be submitted by 02nd February 2022. The comments and counter-comments will be posted on TRAI's website: www.trai.gov.in .

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CHAPTER 1

OVERVIEW OF THE BROADCASTING SECTOR

1.1 Evolution of Television Broadcasting Sector in India

1.1.1 The growth story of the television broadcasting sector in India is as fascinating as the content it delivers. The terrestrial broadcast of Television (TV) service in Delhi commenced on 29th September 1959 by the state-owned Doordarshan (DD). During the 1982 Asian Games held in Delhi, terrestrial broadcasting saw major expansion with DD adding 20 new transmitters to the existing 21¹ to provide national coverage for the first time. Asian Games also introduced color television broadcast in India.

1.1.2 Cable television came to India in 1989 with few entrepreneurs (Cable TV Operators) distributing local video channels that transmitted movies and music videos. Cable Operators usually confined their operations within small areas, such as a housing complex. The advent of satellite television in India was triggered by the broadcast of the Gulf War in the 1990s. The coverage was done by the American news channel, Cable News Network (CNN) which in turn, drove the use of satellite dishes by the Indian cable operators for procuring CNN's signals. The launch of Star TV and Zee TV in 1992 further stimulated the spread of cable TV. According to a study conducted by the market research firm, M/s Frank Small for Star TV, from a mere 412,000 cable TV homes in January 1992, the number of cable homes went up to 1.2 million by November 1992. By the end of 1994, M/s Frank Small estimated the numbers of cable and satellite homes at 11.8 million out of a total of 32.4 million TV-owning homes. The industry has since seen a double-digit growth with current estimates suggesting around 212 million pay television subscribers. Figure 1.1 depicts growth of TV

¹Available at: <https://www.indiatoday.in/magazine/special-report/story/19821231-doordarshan-opens-a-new-chapter-by-transmitting-colour-coverage-of-asian-games-772516-2013-07-29>

households in India. Considering an estimated 40 million subscribers of free-dish, India has 160-165 million pay television consumers.

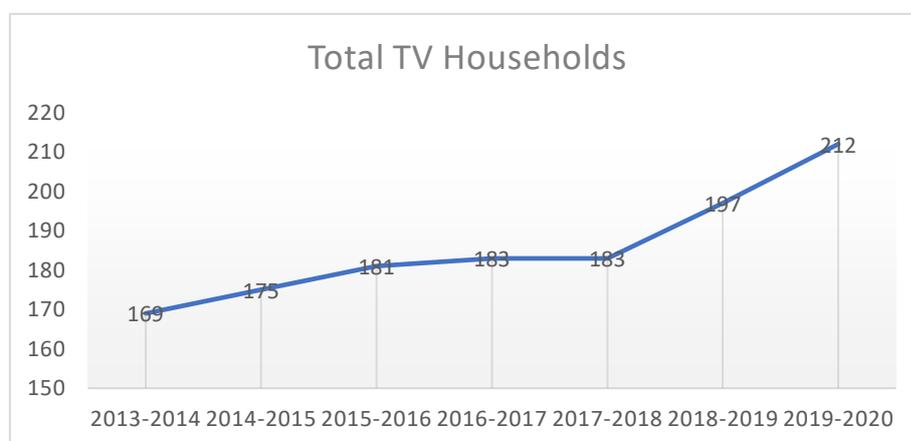


Figure 1.1: - Total TV Households in India

Source: All India Digital Cable Federation

1.1.3 During its inception, the cable TV distribution business was unregulated and fragmented, driven by thousands of small-scale operators with a scattered client base. Lack of regulation resulted in increasing disputes over market control, royalty payments, copyright violations, etc. The Government promulgated the Cable Television Networks (Regulation) Ordinance 1994 on 29th September 1994 to bring order to the Cable TV sector. The ordinance was later converted into the Cable Television Networks (Regulation) Act 1995 (hereinafter referred to as the ‘Cable TV Act/CTN (R) Act’) on 25th March 1995, wherein provisions for cable operator registration, their obligations, program code, etc., have been specified.

1.1.4 The Government brought a standard policy/regulatory framework for satellite broadcasters in 1999. The policy Up linking/Down linking of TV Channels encompasses the issues related to spectrum allocation, content regulation, and other aspects. Guidelines for Direct-to-Home (DTH) platform were issued in 2001², and DTH operations commenced in India in 2003. Subsequently, the Government has brought in guidelines

² MIB order No.8/1/99-PBC (Vol.II) dated 15/03/2001

for Head-end Into The Sky (HITS) operators and the Internet Protocol Television (IPTV).

1.1.5 The 'Cable TV Act' provides a framework for the hitherto unorganized sector. However, the cable TV operations have largely remained analog with poor quality of service and non-transparency in service agreements amongst the stakeholders.

1.1.6 The Central Government, vide a notification dated 9th January 2004³, decided to entrust regulatory functions relating to the broadcasting and cable TV sector to the Telecom Regulatory Authority of India (TRAI/the Authority). Since then, the sector has undergone massive transformation and growth. TRAI has enabled proactive regulations that establish a level playing field and transparency. The transparent regime has engendered all round growth in the sector. Whether one look at revenue wise growth or number of television channels or the number of distribution platform owners, the sector has set up new benchmark of growth under the [able] watch of regulator TRAI and policy makers at MIB. Effective regulatory oversight has enabled one of the lowest prices for television subscription across the globe. At \$5-7 the effective average price of pay television subscription is 1/10th when compared to United States.

1.1.7 With 901 TV channels, including 327 Pay TV channels⁴, offered by 357 broadcasters,⁵ the Indian TV industry is the world's second-largest TV viewing universe across the globe after China⁶. According to Media Partners Asia, there are 169 million TV households in India which includes 42 million Terrestrial/Free Satellite connections. As of 31st March 2021, there are 1726 MSOs registered with the Ministry of Information and

³ Ministry of Communications and Information Technology vide Notification No. 39 dated 09.01.2004 bearing S.O. No. 44(E)

⁴ Available at: https://www.trai.gov.in/sites/default/files/QPIR_27082021.pdf

⁵ TRAI, Consultation Paper On Interoperability of Set Top Box, 11 November 2019; Available at: https://tra.gov.in/sites/default/files/CP_STB_Interoperable_11112019.pdf

⁶ TELEVISION INDUSTRY IN INDIA, IBEF Knowledge Centre, IBEF, January 2020; available at: <https://www.ibef.org/blogs/television-industry-in-india>

Broadcasting (MIB).⁷ Further, there are 12 MSOs & one Headend-In-The-Sky (HITS) operator who have a subscriber base greater than one million each.⁸ There are currently 4 Pay DTH operators functional in India, providing television services to a total of 69.57 million subscribers as on 31st March 2021.⁹ Further, there are 17 registered Internet Protocol Television (IPTV) service providers. The total subscriber base under the IPTV segment is less than a million. However, with the increasing industry shift to convergence, the IPTV segment is likely to see significant growth in days to come.

1.1.8 This consultation focuses on television broadcasting through cable, DTH, HITS and IPTV. There are few other transmission mechanisms that may enable broadcast for wider usage like Digital Terrestrial Transmission (DTT), Radio Broadcast services, satellite uplinking and downlinking facilities etc. However, given the current market structure, pay television broadcasting is predominantly through cable television, DTH, IPTV or HITS. As such, this consultation paper is mainly covering issues related to promotion of local manufacturing in television broadcasting sector.

1.2 Digitalization of the Cable Broadcasting Service

1.2.1 Since inception, the Authority has followed a light-touch regulatory approach, focusing on sustained growth for the sector. TRAI undertook concerted consultations for the digitalization of cable TV distribution networks. Under TRAI's recommendations dated 5th August 2010 on Digital Addressable Systems (DAS), the Government issued a notification dated 11th November 2011, which laid down the roadmap for implementation of digitalization in the cable television sector. Digitalization in the cable television sector was implemented in four phases, which started in 2012 and culminated in March 2017.

⁷TRAI, The Indian Telecom Services Performance Indicators, January – March, 2021; Available at: https://www.trai.gov.in/sites/default/files/QPIR_27082021.pdf

⁸TRAI, The Indian Telecom Services Performance Indicators, January – March, 2021; Available at: https://www.trai.gov.in/sites/default/files/QPIR_27082021.pdf

⁹TRAI, The Indian Telecom Services Performance Indicators, January – March, 2021; Available at: https://www.trai.gov.in/sites/default/files/QPIR_27082021.pdf

1.2.2 In line with the evolving technological landscape, the government allowed entry of other distribution platforms in the television broadcasting sector. The guidelines for Internet Protocol Television (IPTV) and Headend In The Sky (HITS) platforms were issued in 2008¹⁰ and 2009¹¹, respectively. These distribution platforms, i.e., DTH, IPTV, and HITS used Digital Addressable Aystems (DAS) since inception.

1.2.3 DAS comprises a set of digital hardware (digital headend) and software tools used in satellite and cable TV industries for transmitting television channels in an encrypted form to their subscribers. At the subscribers' premises, a set top box (STB) enables to view free, paid, or on-demand encrypted channels, as per the subscriber's authorization based on the subscription. In a cable television network, authorization is given and controlled by the Multi System Operator (MSO), who owns the DAS but may work with different Local Cable Operators (LCO) in different markets.

1.2.4 Post deployment of DAS, the hardware deployed in distribution network can be broadly classified into the following three categories:

- A. **Headend Equipment:** like LNB (low-noise block downconverter), IRD (Integrated receiver/decoder), Encoder, Multiplexers (QAM for cable operators, QPSK for DTH operators), etc.
- B. **Transmission Equipment:** like EDFA, GPON OLT, Optical Fiber Cable, RF Cable, Outdoor Fiber Amplifiers, Signal Amplifiers, Power Distributors, Repeaters, etc.
- C. **Consumer Premises Equipment:** like Set Top Box (STB) and Optical Network Terminal (ONT), etc.

¹⁰MIB order No. 16/03/2006-BP&L Vol. IV dated 08/09/2008

¹¹MIB order No. 9/02/2005-BP&L Vol. III dated 26/11/2009

1.3 Digital Headend equipment

1.3.1 Digital headend comprises a set of equipment that accepts broadcast TV signals as input from satellites, processes them into cable-quality encrypted signals, and then transmits the combined feed to the local cable networks. A headend usually consists of an integrated receiver/decoder, encoders, trans-coders, channel modulators, channel processors, and channel signal combiner. The main functions of Digital Head End are:

- i. Content receiving from the satellite broadcasters
- ii. Data acquisition function performed by IRD, Encoder, etc.
- iii. Data processing function performed by Multiplexers, Switches, QAM Modulators, Combiners, etc.
- iv. Encryption and Addressability, performed by CAS, SMS, STB, etc.

Figure 1.2 depicts a schematic representation of a digital headend.

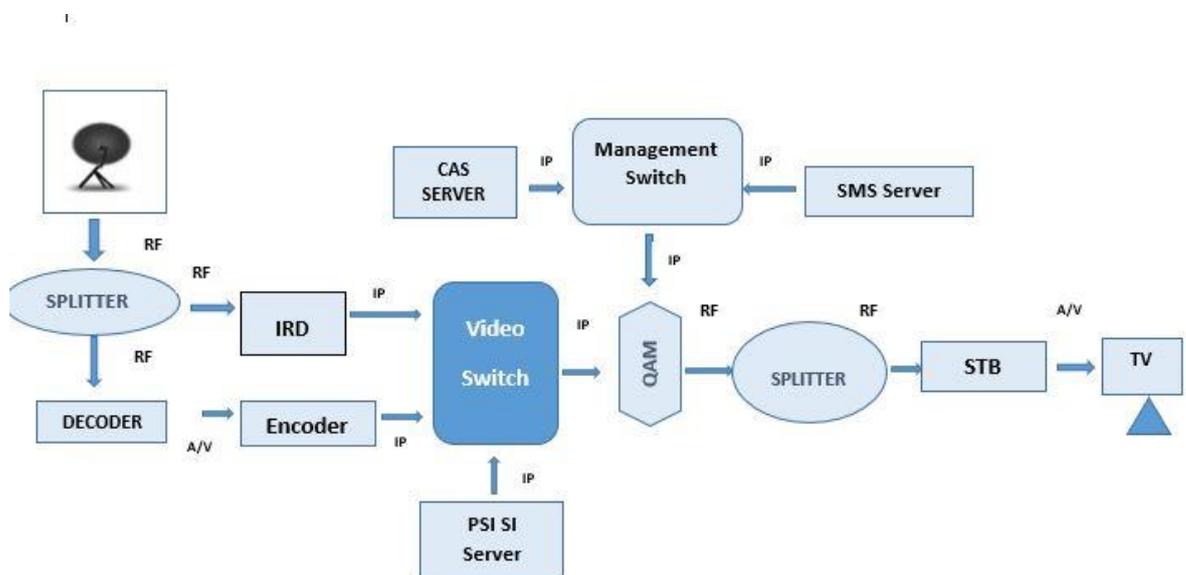


Figure 1.2: - Digital Headend System Block Diagram

1.3.2 The main components of Digital Headend are described below:

- i. Integrated Receiver Decoder (IRD): It is a high-end set-top box with a better receiver quality. An IRD is used in the headend system; it demodulates and decodes the RF signals as received from the satellite receiver. An IRD is issued by the respective broadcaster. It may be used both by Free to Air (FTA) or Pay TV channels if the transmitted signal is encrypted.
- ii. Decoder: It is used to decode the channel. A decoder has RF input and provides the composite audio-video signal.
- iii. Encoder: It is a device that converts information from one format or code to another, for the purposes of standardization, speed, secrecy, security, or for saving space by shrinking size. It generates DVB transport stream and IP output. The IP output from the encoder goes into the video switch. The encoder is used to control the bit rate and volume of the channels. Encoders are of two types: Standard Definition (SD) and High-Definition (HD).
- iv. Program Specific Information (PSI): Service Information (SI) Server is responsible to generate PSI (PAT, PMT, CAT, NIT)/SI (BAT, SDT, EIT) tables. The server maintains LCN Numbers, EPG, Bouquets and Service descriptions.
- v. Video Switch: The output of IRD, PSI-SI server and encoders are fed to the Video switch. The video switch is a typical 48 GB port switch that can be configured to maintain data. Output from the video switch is fed into Quadrature Amplitude Modulator (QAM).
- vi. Quadrature Amplitude Modulator (QAM): It is used to modulate the signal for its transmission to long distances using Transmitters and Amplifiers in the field. The major processes done in QAM are PID mapping, scrambling, and RF conversion.

1.4 Transmission Equipment

1.4.1 The distribution network is part of a cable television system that connects the headend of the system (video and media sources) to the consumer's equipment. Most cable TV networks deploy RF-based HFC (Hybrid Fibre Coax) networks. Herein the last mile is a coaxial cable network; however, the long-distance transmission is on optical fibre network. Various components of the network are Erbium-Doped Fiber Amplifier (EDFA), optic transmitters, optic nodes, and RF amplifiers. The architecture of the network takes the form of a tree, with the "trunk" carrying signals to the neighborhoods and "branches" carrying the signals closer to the homes. Finally, "drops" carry the signals to individual homes. Figure 1.3 illustrates a typical cable distribution network.

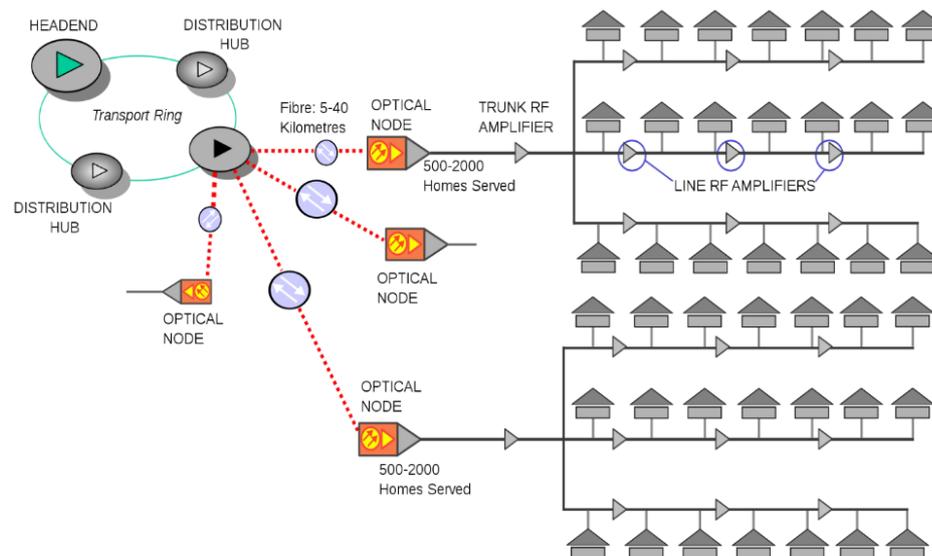


Figure 1.3: Cable Television distribution¹²

1.4.2 Broad functions of the transmission equipment are described below:

- i. Erbium-Doped Fiber Amplifier (EDFA): EDFA is an optical amplifier used in the C-band and L-band to boost the intensity of optical signals

¹² Available at: https://en.wikipedia.org/wiki/Cable_television

being carried through a fiber optic communications system. EDFA is used to compensate for the loss of an optical fiber in long-distance optical communication. Another important characteristic is that EDFA can amplify multiple optical signals simultaneously and thus can be easily combined with WDM technology.

- ii. Optical line termination (OLT): An optical line termination (OLT), also called an optical line terminal, is a device that serves as the service provider endpoint of a passive optical network. It provides two main functions:
 1. to perform the conversion between the electrical signals used by the service provider's equipment and the fiber optic signals used by the passive optical network.
 2. to coordinate the multiplexing between the conversion devices on the other end of that network (called either optical network terminals or optical network units).
- iii. Fiber Optic Node: A fiber optic node has a broadband optical receiver, which converts the downstream optically modulated signal coming from the headend or hub to an electrical signal going to the homes. The fiber optic node also contains a reverse- or return-path transmitter that sends communication from the home back to the headend. Fiber optic cables connect the headend or hub to optical nodes in a point-to-point or star topology, or in some cases, in a protected ring topology.
- iv. RF Power Amplifier: A radio frequency (RF) power amplifier is a type of electronic amplifier that converts a low-power radio-frequency signal into a higher power signal. Typically, RF power amplifiers drive the antenna of a transmitter. The main characteristics of an RF amplifier are linearity, efficiency, output power, and signal gain. However, RF amplifiers are categorized according to their usage.

1.5 Consumer Premises Equipment:

1.5.1 Apart from cables and accessories, the main devices deployed at consumers' end are the Optical Network Terminal (ONT) (used in case of an optical fiber to the home [FTTH] connection) and Set Top Box (STB).

- i. ONT (Optical Network Terminal): ONT, also called ONU (Optical Network Unit), refers to the consumer-end equipment in an optical Fiber to the Home (FTTH) link. The ONT/ONU receives downstream data from the OLT (Optical Line Termination) through the passive optical splitters and provides video, voice, and broadband services to the consumer.

A passive optical network (PON) consists of an optical line terminal (OLT) at the service provider's central office (hub) and several optical network units (ONUs) or optical network terminals (ONTs), near the end users.

- ii. STB: A set top box (STB) is a device that receives a digital signal, decodes, and displays it on television. Based on the transmission type, i.e., cable, satellite, or terrestrial, the STBs are based on corresponding DVB standards, i.e., DVB-C, DVB-S, or DVB-T. Their hardware configuration generally remains the same except for the tuner and demodulator, as it depends on the transmission scheme. The STB retrieves the TV channels and other services from this signal through demodulation, descrambling, and decompression. The STB enables only authorised users to view services as subscribed by them. Further, based on the type of service, three types of STBs are currently being deployed in the Indian market: RF, Hybrid, and IPTV, used in CATV/DTH, Hybrid, and IPTV networks, respectively.

1.6 Software Components

1.6.1 In addition to the equipment and hardware deployed in the network, certain key software components play a vital role in the broadcasting distribution chain. The Conditional Access System (CAS) is responsible for the encryption of content and its secure delivery to

authorized subscribers. CAS is at the core of the Digital Addressable System and is responsible for content security, entitlement management, and entitlement control for the content. The Subscriber Management System (SMS) essentially acts as the management centre for the CAS. The SMS is responsible for the activation/deactivation of STBs, managing subscriber information, channel information, billing, and other such activities.

- i. Conditional Access Server (CAS): It provides access to only an authorized receiver/STB to decrypt the broadcast content. Essentially, CAS ensures that content delivery from the operator to the STB is secure and provides a mechanism of addressing each STB uniquely. CAS comprises a combination of scrambling and encryption to prevent unauthorized reception. Scrambling renders the sound, pictures, and data unintelligible, while protection of the secret keys during transmission is achieved through encryption. Entitlement Control Message (ECM)/Entitlement Management Message (EMM) are two essential parts of the CAS. CAS server generates ECMs, which are sent to QAM. ECM is encrypted and contains the control words (CW) to give access to the subscriber for a particular program or service, while EMM contains the information of subscriber packages.
- ii. Subscriber Management Server (SMS): The SMS is essentially the management center of the CAS. It is a firmware, a combination of hardware and software integrated with the CAS server. SMS stores and manages details of each subscriber and the TV channels that are subscribed to by the subscriber. Based on the channels that the subscriber has paid for, the SMS asks for Entitlement Management Messages (EMM) from the Subscriber Authorization System (SAS). SMS manages essential subscriber-related activities, such as activation, deactivation of STBs, enabling, modifying channel/bouquet authorizations as per the user's subscription, generating subscriber bills, etc. In addition, SMS can also provide a range of services to

support the business needs of the service provider, including, but not limited to, the generation of various operational and system reports.

1.6.2 There are at present more than fifteen CAS systems deployed by the distribution platform owners (DPOs) in India. The list of CASs currently deployed in India, as per the industry information, is appended in **Annexure A**. Similarly, there are different SMSs deployed by DPOs sourced from different vendors, local as well as foreign, appended in **Annexure B**.

1.7 Global trends of Manufacturing in Broadcasting Sector

1.7.1 The global market size of broadcasting equipment is estimated to be at US\$ 6.2 billion in 2021.¹³ The global market size has increased at 6.6% Compound Annual Growth Rate (CAGR) from 2017 to 2020.¹⁴ The figures are estimated to further register an exponential growth to US\$ 15 billion by 2031 at 9.4% CAGR¹⁵ as can be seen in Figure 1.4.

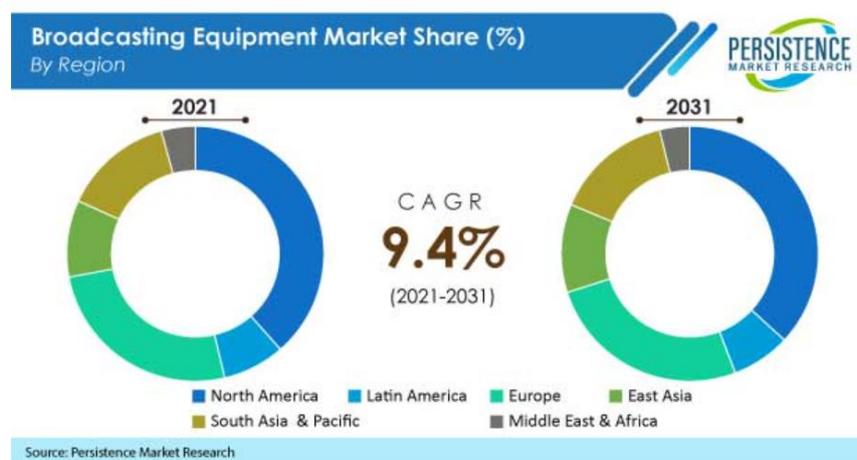


Figure 1.4: Global market share of broadcasting equipment

Source: Persistence Market Research¹⁶

¹³Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

¹⁴Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

¹⁵Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

¹⁶ Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

1.7.2 It can be seen that North America comprises a major portion of the global market share for broadcasting equipment which is seemingly estimated to persist till 2031. U.S. is said to be the biggest contributor and is estimated to have a market size of over US\$ 1.6 billion in 2021. The probable reasons behind the persistence of North America's large global market share could be the presence of big service providers like Cisco Systems, Harmonic Inc., etc., along with the rising demand for ultra-high-definition content.¹⁷

1.7.3 Further, Europe seems to be the second biggest contributor to the global market share, followed by South Asia and Pacific countries. The UK holds a major position in the global market share, which is estimated to be US\$ 1.4 billion by 2031. These figures reflect the increased access of a wide range of media and communication services along with the growth in convergence in the usage of equipment across sectors for the consumption of content.¹⁸

1.7.4 China is estimated to have a market value of around US\$ 385 million in 2021. The Asian countries of China, Japan, and South Korea are performing well in the broadcasting sector owing to an increase in the demand for digital broadcasting, especially in the wake of the COVID-19 pandemic when there was an influx of digitization in businesses. The rising popularity of digital content also stimulates market growth in these countries.

1.7.5 The broadcast equipment market in India is also expected to witness growth in the years to come, driven by the steady rise in the demand for digital content across various broadcasting channels. In fact, India is considered as one of the top five countries driving demand for broadcasting equipment, along with the U.S., U.K., China and Japan.¹⁹

¹⁷Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

¹⁸ Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

¹⁹ Available at: <https://www.persistencemarketresearch.com/market-research/broadcasting-equipment-market.asp>

1.8 Context of the Present Consultation:

1.8.1 The fast-paced digitalization of the Indian broadcasting sector specially in Television Broadcasting, provided a unique opportunity for the growth of local manufacturers to cater to the demand. However, the share of locally manufactured equipment/devices in the broadcasting distribution networks remains quite low. The implementation of DAS started way back in 2012. Even after eight years, most of the equipment and STBs are imported. Chapter 2 deals with different equipment in the television broadcast sector and their origin.

1.8.2 Further, it has been mentioned earlier in this chapter that the television viewing universe in India has grown to the second-largest in the world. However, the TV penetration remains abysmal 55%²⁰, hinting that a large population still lacks access to TV (Figure 1.5). This implies that there is still a large untapped demand potential, providing an opportunity to meet such demand through local manufacturing.

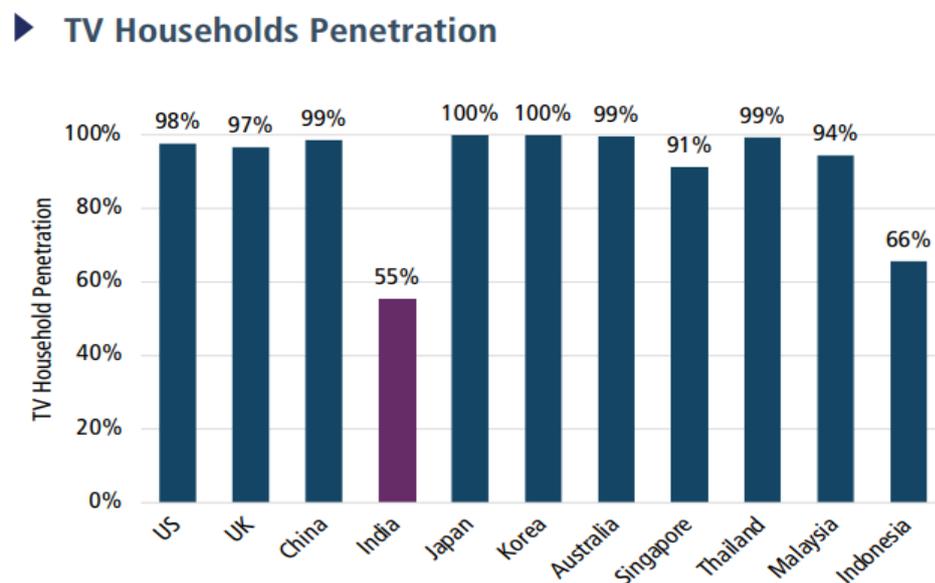


Figure 1.5: TV Household Penetration Across Different Countries

Source: Media Partners Asia

²⁰ The penetration figures are projected by MPA inputs based on an estimated number of households at 306 million, extrapolated over census 2011 figures as per estimated growth rates.

1.8.3 The Government of India has accorded the highest priority to transform India into a global design and manufacturing hub. Recently launched prominent programs under flagship initiatives include 'Make in India' and 'Digital India'. However, they are still at evolving stage, and the contribution of local manufacturing remains insignificant in the broadcasting sector as of now. Preliminary inputs from the industry stakeholders cite a lack of level-playing field vis-à-vis competing nations as a major concern that renders domestic manufacturing uncompetitive.

1.8.4 This consultation has been initiated to seek stakeholders' inputs regarding underlying challenges as well as enabling measures that can facilitate the local manufacturers in television broadcasting sector to meet domestic demand and also pave the way for export-oriented growth. The objective is to make India realize its true potential in the domestic manufacturing of equipment deployed in the television broadcasting sector and enabling its transition from an import-driven industry to a sustained 'Atmanirbhar ecosystem'.

1.8.5 The consultation paper consists of five chapters. Chapter 2 deals with the local manufacturing in the television broadcast sector with respect to domestic manufacturing in India. Chapter 3 describes the various policy initiatives undertaken by the government to boost local broadcast and electronics manufacturing in India. Chapter 4 deals with concerns of the industry and possible roadblocks in local television broadcast equipment manufacturing. Chapter 5 summarizes the issues for consultation, seeking responses from all stakeholders.

CHAPTER 2

MANUFACTURING IN THE TELEVISION BROADCASTING SECTOR

2.1 The previous chapter provided a broad overview of the television broadcasting sector in India discussing the wide categories of equipment used. To assess India's potential for local manufacturing in the television broadcasting sector, we need to look at the local industry ecosystem for various equipment/components.

2.2 The Standing Committee on Information Technology in the 25th Report of (2020-2021) provides a submission made by the Ministry of Information and Broadcasting on the issue of local manufacturing. The MIB submission states that *“most of the major broadcast equipment, i.e., SW Transmitters, FM transmitters, Diplexer, Antenna RF cable, measuring equipment, programme production software, Digital transmitters, Camcorder, NLE, Production Switcher, Routing Switcher, DFS, PDA, Measuring equipment, HPA, Encoder, IRD, Upconverter & Downconverter, Modulator, etc., are not available in the Indian market. They need to be imported from foreign vendors. The manufacture of equipment depends upon the requirement in Indian market. Private broadcasters have entered into the operation in recent years, but growth has not surged. Moreover, Indian firms are not competitive with foreign firms on account of pricing and quality.”*²¹ Hence, the Indian industry in the broadcast sector is beset with some challenges.

2.3 Industry stakeholders during interaction on this subject have echoed the observations mentioned above. It is affirmed that the bulk of the deployments in the television broadcast sector are being met through imports. The consolidated data for reflecting the origin of manufacture in the television broadcast sector is not available. However, the following sections attempt to

²¹ 25th Report, Demands for Grants, Standing Committee on Information Technology (2020-2021), Ministry of Information & Broadcasting, presented to Lok Sabha on 10.03.2021, Laid in Rajya Sabha on 10.03.2021.

draw a broad picture of the source of equipment deployed in the sector. This has been attempted by collating the miscellaneous formal and informal inputs received from the industry stakeholders and other sources.

2.4 Inputs from the industry reveal that the majority of the headend equipment is imported. In the transmission segment, the equipment is sourced from both local and foreign sources, while OF and RF cables are primarily procured locally. In the case of the consumer premises equipment, ONT/ONU are primarily imported, while in the STBs segment there is some local deployment. However, a large chunk of STBs is still being procured through import. Table 2.1 shows a segment-wise simplified illustration of the levels of local manufacturing in the television broadcast distribution chain.

| Equipment Source | Headend Equipment | Transmission Equipment | Consumer Premises Equipment |
|---|--|---|------------------------------------|
| Largely imported | IRD, Encoder, Multiplexer, Data Switches, Network Switches | EDFA, GPON OLT | ONT |
| Mixed, i.e., both domestic and imported | CAS server hardware, CRM servers (if deployed) | Mixer, Outdoor Fiber amplifier, Signal Amplifier, Power distributors, repeaters | STB |
| Largely domestic | SMS server hardware, Network racks, connecting cables | OF Cables, RF Cables | AV cables, HDMI cables |

Table 2.1 Equipment Sourcing in Indian TV Distribution Networks

Source: Industry inputs

2.5 The next sections examine the demand and deployment patterns in recent years across various segments of the distribution networks.

2.5.1 Headend Equipment:

The demand for headend peaked during the period following the notification for implementation of DAS in 2012-2017. There was a time-bound target for migration to the DAS regime. In the absence of availability of local headend equipment, the demand was almost entirely met through imports. In general, the large MSOs installed equipment imported from American and European manufacturers. However, owing to cheaper prices, most of the small MSOs deployed imported equipment from China.

With the completion of the digitalization of the Cable TV network in 2017, the demand for headend equipment has tapered off. There is some demand now caused by expansion (adding more channels), upgrade (adding HD channels), any replacement, etc. Some new registrations are also issued by the Ministry of Information and Broadcasting, causing some procurement. Table 2.2. provides estimated procurement of headend equipment over recent years.

| S. No. | Name of the headend equipment | Year-wise Volume | | | | | |
|--------|-------------------------------|------------------|--------|---------|--------|---------|--------|
| | | 2018-19 | | 2019-20 | | 2020-21 | |
| | | Local | Import | Local | Import | Local | Import |
| 1 | IRD | 100 | 2500 | 100 | 2500 | — | 1250 |
| 2 | Encoder | 1000 | 10000 | 450 | 4500 | 100 | 1000 |
| 3 | Modulator | — | 1200 | — | 2200 | — | 1200 |

*Table 2.2: Year-wise Volumes of Head-end Equipment
(Imported and Locally Produced)**

Other avenues: Some ISPs are upgrading their networks to offer linear TV, in addition to fixed broadband. It has not yet become a major trend though.

2.5.2 Transmission Equipment:

The transmission equipment used for back haul connectivity and access connectivity to the customer premises in television broadcasting sector are broadly same as those being used in Telecom Sector. TRAI is working on a separate paper for promoting local manufacturing of Telecom Transmission Equipment. However, in order to have synergy in television content delivery from end to end, the telecom equipment have also been included in this document. This will further, facilitate local manufacturers to look into embedding of some transmission equipment with broadcasting equipment and/or to define network interface specific to the broadcasting sector.

Most cable TV networks deploy RF-based HFC (Hybrid Fibre Coax) networks consisting of components such as EDFA, optic transmitters, optic nodes, and RF amplifiers, etc. Most of these devices are manufactured in India by the MSME sector.

But, as in the case of headends, demands for these components have depleted after the migration of cable TV networks to the DAS regime. Sales are now limited to replacements and expansion. An opportunity exists, especially in smaller towns where several LCOs are providing broadband services. For this purpose, the LCOs form a partnership with ISPs, with the LCO providing last-mile connectivity to the ISP. However, these networks are independent of the LCO's HFC network. As per market information, such networks are importing almost entire transmission devices from China, often as Semi-Knocked Down (SKD) units. These devices are just assembled in India, with all the parts coming from imports.

Table 2.3 shows the estimated volumes of transmission equipment deployed in the sector over recent years.

| S. No. | Name of the transmission equipment | Year-wise Volume/Value | | | | | |
|--------|------------------------------------|------------------------|--------|---------|--------|---------|--------|
| | | 2018-19 | | 2019-20 | | 2020-21 | |
| | | Local | Import | Local | Import | Local | Import |
| 1 | EPON/ GPON OLT** | — | 2500 | — | 5000 | — | 10000 |
| 2 | Transmitters | 5500 | — | 3500 | — | 2500 | — |
| 3 | EDFA | 1500 | 1000 | 700 | 500 | 200 | 200 |
| 4 | Optic Nodes | 100000 | — | 80000 | — | 60000 | — |
| 5 | RF Amplifiers | 35000 | — | 20000 | — | 15000 | — |

*Table 2.3: Year-wise Volumes of Transmission Equipment (Imported and Locally Produced)**

* Estimates provided by M/s Catvision Limited

**SKD imports of OLT are considered as import

2.5.3 Consumer Premises Equipment:

The two broad categories of end-consumer devices are STB and ONT/ONU. ONT/ONU are at present mostly being imported into India, either in Completely Built Up (CBU) or SKD form. As the market shifts to an increasingly converged networks with hybrid television, broadband and data services demand for ONT/ONU is also expected to increase exponentially.

In the entire television distribution chain, STBs are the devices generating maximum demand after the completion of digitalization of the Cable television sector in India. Industry sources estimate annual STB demand to be around 28 million, as can be seen in Table 2.4. The demand for around 45% of households still lacking television reach, replacement of boxes completing their useful life, upgrade from SD to HD, etc., are considered as main factors to drive this demand.

| Sl. No. | Factor | Rationale | Estimated Demand (yearly) |
|---------|---|--|---------------------------|
| 1. | Increasing TV penetration | TV penetration is increasing in India, still more than 100 million households are without TV | 6 million |
| 2. | New STBs from TV Sales | <ul style="list-style-type: none"> As per EY estimates, 14 million TV sets are sold yearly. At an estimated 20% of TV buyers- as new TV households, it will add to corresponding demand for STBs | 3 million |
| 3. | Replacement of Boxes due to wear and tear | <ul style="list-style-type: none"> Average life of STB is 6 years as per the industry. Estimated STBs installed in phase I and phase II of DAS are 40 million. 50% of them are yet to replace the old STBs, accordingly the figure comes to 20 million. | 5 million |
| 4. | Conversion from SD to HD | Out of about 170 million subscribers, there are only 10-12 million HD subscribers at the end of 2018. Consumer preference for HD content is increasing for better quality. | 8 million |
| 5. | DD Free Dish Demand | Current base of DD Free Dish subscribers ~40 million. About 10% demand can be estimated for replacement as well as new subscriptions. | 4 million |
| | | Total | 26 million |

*Table 2.4: Projected Market Demands for STBs in India**

** Based on Industry inputs*

As against the demand projected above, local manufacturers have developed their production capabilities over the years. Table 2.5 shows the production capabilities of STB in India with respect to prominent players.

| India's STB Production Capacity: Select Players | |
|--|-----------------------------------|
| Companies | Annual Production capacity |
| Logic Eastern | 3,00,000 |
| Aggressive Digital | 10,00,000 |
| MCBS | 10,00,000 |
| Ridsys | 1,00,000 |
| STB Technology | 10,00,000 |
| Surbhi Satcom | 15,00,000 |
| Rashmi Electronics | 36,00,000 |
| Velankani Electronics (Expandable to 10 mn) | 50,00,000 |
| Exza Infosystems | * |
| My Box Technology | * |
| Catvision India | * |
| ITI Palghat | 20,00,000 |
| ECIL | 30,00,000 |
| Small EMS | 12,00,000 |
| Total | 1,97,00,000 |

Table 2.5: India's STB Production Capacity and Production: Select Players

*Information not available

Note: - In addition, there are several OEMs and EMS in India that have large SMT capacities and are capable of manufacturing STBs.

Source: CII's Presentation on India's STB Industry- Challenges & Recommendations

Table 2.6 shows import figures of ONT/ONU and local deployment of STBs over recent years, while Figure 2.7 shows import figures for STBs in recent years.

| S. No. | Name of the broadcast equipment | Year-wise Volume/Value (in million) | | | | | |
|---------------|--|--|--------|---------|--------|---------|--------|
| | | 2018-19 | | 2019-20 | | 2020-21 | |
| | | Local | Import | Local | Import | Local | Import |
| | ONU/ONT* | | 0.5 | | 1 | | 2 |
| | Set Top Box*** | 5 | | 2.5 | | 1.5 | |

*Table 2.6: Year-wise Volumes of Consumer Premises Equipment (Imported and Locally Produced)**

* Estimates provided by M/s Catvision Limited

**SKD imports of ONU/ONT are considered as import.

***Quantity estimates for STB are given only for locally manufactured products. These do not include EMS production of foreign brands.

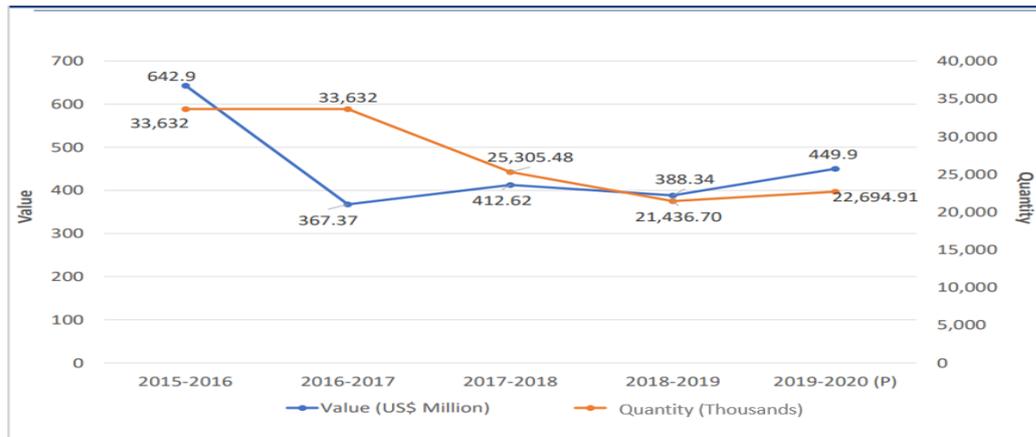


Figure 2.1: India's STB Industry: Imports

Source: CII's Presentation on India's STB Industry- Challenges & Recommendations

It can be seen from the preceding figures that despite adequate local production capacity, only a small portion of the STB demand is catered by local manufacturers. More than 80% of the demand is met through imports. As per the industry sources, DTH operators and large MSOs source their STBs from Korean and Chinese ODMs through ASEAN route. In few cases, ODMs are getting the STBs manufactured by large EMS companies located in India. The small MSOs either import basic STBs with minimal features or procure from local manufacturers.

A recent trend in the STB market, especially in urban areas is upgrading to HD boxes, largely due to not much price difference between HD and SD boxes. A significant exception to this trend remains the DD Free-dish network, as majority of their market comprises SD MPEG-2 FTA service. Further, with the growing emergence of converged services, the demand for Hybrid and IPTV STBs is increasing significantly.

Recently, DTH players Dish TV and Tata Sky announced shifting the STB manufacturing to India. Dish TV, in collaboration with multiple partners such as

Dixon Technologies and Handan, aims to domestically manufacture 50% of STBs by the first quarter of 2021 in a bid to promote and support the 'Made in India' initiative of the government. The work of procuring the locally manufactured components and accessories of STBs from Indian manufacturers is already in progress.²² Tata Sky, in partnership with Technicolor Connected Homes, also had announced plans for local manufacturing of HD STBs and Android enabled Tata Sky Binge+ boxes in a phased manner.²³ In August 2021, the first batch of India-made Tata Sky set-top boxes have been released in the market.²⁴

2.6 Conditional Access System (CAS) and Subscriber Management System (SMS) (Software components):

2.6.1 As mentioned in the previous chapter, the DAS environment consists of the Conditional Access System (CAS), which is responsible for the encryption of content. CAS enables secure delivery of the television channels to only authorized subscribers. The other key software component, the Subscriber Management System (SMS), is responsible for the activation/deactivation of STBs, managing subscriber information, channel information, billing, and other such activities. CAS and SMS systems in conjunction play a pivotal role in the pay television service value chain.

2.6.2 One can see from the list of CAS and SMS vendors (attached as Annexure A and Annexure B, respectively) that the sector is considerably dependent on foreign vendors for the CAS platforms. A key challenge in the design and development of domestic STBs was identified as the dependence on foreign CAS. At the time of notification for implementation of digitalization in the Cable Television sector, there were no domestic players in the CAS segment. Moreover, the foreign CAS companies have pre-existing tie-ups

²² Available at: <https://www.dishtv.in/Pages/atam-nirbhar-bharat-abhiyan.aspx>

²³ Available at: <https://www.tatasky.com/dth/press-releases/tata-skys-partner-technicolor-move-their-set-top-box-manufacturing-india>

²⁴ Available at: <https://www.thehindubusinessline.com/info-tech/tata-sky-launches-first-batch-of-make-in-india-set-top-boxes-in-association-with-technicolor/article36113522.ece>

with other stakeholders like System-On Chip (SoC) providers, STB manufacturers, System Integrators, etc. Such tie-ups are driven by the techno-commercial interests of the concerned stakeholders. In such a scenario, domestic manufacturers are required to enter into an agreement with global CAS companies. Often such foreign players do not offer the most convenient or competitive terms for the domestic players. Therefore, the need, as well as an opportunity, was felt to develop a local CAS for boosting the development and manufacturing of STBs in the country.

2.6.3 In November 2014, the Ministry of Electronics and Information Technology (MeitY), through a novel Public-Private Partnership (PPP) model, funded a project for the development and implementation of Indian Conditional Access System (iCAS) for Set Top Boxes (STBs). The development of iCAS was completed in November 2015. As per the terms of the project, the iCAS was made available to domestic STB manufacturers for a duration of three years at a price of USD 0.5 per license, as against a price of USD 3-5 per license for other CAS vendors. As per MeitY, over 1.8 million STBs had been deployed with iCAS up to 2019-20. However, Indian CAS companies still have a very limited share in the Indian markets to date.

Issues for consultation: Apropos the discussion above, the issues for consultation are:

Q1. What is your assessment in respect of local manufacturing in the television broadcast sector of India? Is there requirement for a focused action in promoting local manufacturing in the television broadcast sector? Please elaborate.

Q2. Do you think there is an adequate opportunity, market, and/or demand for the manufacturing of television broadcasting (headend, back haul transmission, CPE and others) equipment in India? Please provide your comments with supporting inputs and data. What are specific requirements of special interfaces and features needed in transmission equipment used in Television broadcasting

sector? Elaborate with respect to specific equipment like headend interface equipment and CPE/STB.

Q3(a). Do Indian manufacturers have adequate capabilities to meet the broadcasting (headend, transmission, CPE and others) equipment demand of the Indian cable television sector?

Q3(b). If yes, then what new measures, if any, are required for the local manufacturing sector to capture a greater market share?

Q3(c). If your answer to Q3(a) is negative, then please comment what measures can enable local Industry to consider manufacturing of equipment for broadcasting (headend, transmission, CPE and others) segment? Please provide supporting inputs with relevant details.

Q4. What are the reasons for the limited market share of local STBs? Do the local manufacturers face any entry/exit barriers such as, but not limited to cost competitiveness, and/or technology-related issues? Please elaborate with supporting inputs.

Q5. What measures do you suggest for improving the competitiveness of local manufacturers? Please elaborate your comments with supporting inputs and data.

Q6. What other measures can be taken to encourage the adoption/usage of domestically produced STBs and other Consumer Premises Equipment among the distribution platform operators?

Q7. MeitY supported development of local CAS, which has been available for more than two years. What further measures, if any, should be undertaken to enable increase the market share of local STBs, that are designed in India, running on Indian CAS and made in India? Please elaborate with reasoning.

2.7 Moving beyond the segment-wise assessment of the level of local manufacturing in the broadcasting sector, Table 2.7 summarizes import figures of the previous few years with respect to the overall television broadcasting sector and other sectors.

| Sl. No. | Category | Description | HS Code | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 (Apr - Sep) |
|---------|---------------|--|--------------------|-------------------|-------------------|-------------------|-----------------------|
| | | | | Value in USD (Mn) |
| | | Equipment primarily deployed in Broadcasting Sector | | | | | |
| 1 | Headend | CAS Server Hardware/ SMS Server Hardware / CRM Servers (if Any) | 84715000 | 1,519 | 1,795 | 1,706 | 848 |
| 2 | End Customer | STB generic PC | 85177010 | 4,856 | 2,121 | 700 | 273 |
| 3 | Receiver | Dish Antenna - C Band | 85291019 | 32 | 21 | 21 | 7 |
| 4 | Combined | LNB - C Band (Receiver), EDFA (Transmission) | 85299090 | 1,354 | 1,313 | 1,317 | 759 |
| 5 | Receiver | L Band Amplifiers | 85437069 | 25 | 45 | 33 | 9 |
| 6 | Combined | IRD/ Encoder/ Multiplexer (Headend), Signal Amplifiers/ Power Distributors (Outside Plant) | 85437099 | 349 | 410 | 448 | 148 |
| 7 | End Customer | STB (Cable/Satellite), Hybrid STB | 85287100, 85176960 | 512 | 430 | 460 | 92 |
| | | TOTAL VALUE | | 8,647 | 6,135 | 4,685 | 2,136 |
| | | Equipment deployed across multiple sectors | | | | | |
| 1 | Headend | DG Set | 85016410 | 5 | 5 | 28 | 1 |
| 2 | Headend | UPS | 85044010 | 198 | 167 | 181 | 83 |
| 3 | End Customer | Power Adapter | 85044090 | 744 | 766 | 704 | 302 |
| 4 | Combined | ONT (End Customer), Modulator/ Data Switches/ Firewall (Headend), GPON OLT (Transmission) | 85176290 | 4,092 | 5,336 | 3,053 | 1,611 |
| 5 | Headend | Network Switches | 85176990 | 662 | 527 | 443 | 223 |
| 6 | Headend | Network Racks | 85177090 | 6,707 | 6,592 | 7,225 | 2,912 |
| 7 | Headend | CCTV System | 85258020 | 348 | 595 | 906 | 251 |
| 8 | End Customer | Remote/ Batteries | 85299090 | 1,354 | 1,313 | 1,317 | 759 |
| 9 | Miscellaneous | Connectors | 85369090 | 441 | 576 | 550 | 205 |

| | | | | | | | |
|----|---------------|---|----------|---------------|---------------|---------------|--------------|
| 10 | Outside Plant | Mixer/ Repeaters | 85371000 | 461 | 596 | 557 | 196 |
| 11 | Combined | Access Control System (Headend), Fiber Amplifiers (Outside Plant) | 85439000 | 126 | 118 | 119 | 31 |
| 12 | Combined | AV Cable (End customer), Connecting Cables (Headend) | 85442010 | 61 | 63 | 46 | 17 |
| 13 | Miscellaneous | Cable | 85442090 | 36 | 42 | 33 | 13 |
| 14 | Combined | HDMI Cable (End Customer), RF Cable (Outside Plant) | 85444999 | 253 | 250 | 218 | 76 |
| 15 | Outside Plant | Optical Fiber Cable | 90011000 | 51 | 181 | 57 | 18 |
| | | TOTAL VALUE | | 15,540 | 17,128 | 15,437 | 6,698 |

Table 2.7: Import Values of Equipment Deployed in Broadcasting and Multiple Sectors (in USD Million)

Source: MeitY

It may be appropriate to mention here that the figures represented in the table 2.7 above may be taken as indicative, because some equipment/ components are used in both telecom and broadcasting sectors. Hence, there may be overlap in registration of equipment/ components under some HSN codes. However, the figures unequivocally reveal the magnitude of opportunity that lies for local manufacturing sector to tap into.

Further, Table 2.7 reaffirms the position taken in the preceding section regarding the plummeting demand in the television broadcast sector post-implementation of the DAS regime. Thus, this downward trend of import values after FY 2017-18 observed in the television broadcasting sector provides testimony to this observation. In other equipment, imports have remained steady around USD fifteen thousand million over all the three years from FY 2017-18. However, the fact that yearly broadcasting imports amount to more than USD twenty billion makes for a compelling case to examine the extent to which such demand can be met through domestic production. (see table above)

Issue for consultation: Apropos the discussion above, the issues for consultation are:

Q8(a). As per the estimates, yearly broadcasting imports in India amount to more than USD 20 billion. Do you think this market size reflects high potential for local manufacturers for broadcast equipment?

Q8(b) If yes, why the television broadcast sector is still dependent on imports for deployment in networks? Please elaborate.

Q9(a). Looking beyond local markets, can Indian industry gear itself to export television broadcast equipment for export markets?

Q9(b). If yes, what specific measures may be required to enable local manufacturers to compete in global market for television broadcast equipment? Please elaborate with relevant figures and inputs.

2.8 The Authority sought some information from MSOs as regards the classification (domestic vs. imports) of equipment deployed. Sample information received from few MSOs is presented in Tables 2.8 and 2.9. Following inferences are visible:

- i) In terms of value, the level of local manufacturing is around 20% of the total deployment, and;
- ii) While there is a trend of some deployment of locally manufactured STB/CPEs, headend and core equipment are imported.

| Sl. No. | Category | DESCRIPTION | Total Value of equipment manufactured/imported (in Rs.)- MSO 1 | | | | | Total Value: 2016-2021 |
|---------------------------------------|------------------------|---|--|------------------|----------------|----------------|----------------|------------------------|
| | | | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | |
| Imported Equipment | | | | | | | | |
| 1 | End Customer | CPE- (EDFA/Optical Switch/Transmitter/Switch Port etc.) | 0 | 8551472 | 8711653 | 20745625 | 0 | 17263125 |
| 2 | Headend Equipment | CAS- (Meraki Access Point/ Keshet boards/ TED ATO etc.) | 392519 | 4550756 | 0 | 330435 | 0 | 5273711 |
| 3 | Headend Equipment | IRD- (BMD Mini Converters-HDMI to SDI/IRD RX8200 MODULATOR RECEIVER etc.) | 0 | 32706097 | 0 | 0 | 0 | 32706097 |
| 4 | Headend Equipment | SMS (Check Point SG/ LAN Card) | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Headend Equipment | MUX (AV TO HDMI CONVERTOR/ MULTI CHANNEL TRANSCODER GN-1772 etc.) | 1990981 | 124514078 | 146696 | 2744712 | 7077290 | 136473757 |
| 6 | Distribution Equipment | Networking | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Total | 2383500 | 170322404 | 8858349 | 3075147 | 7077290 | 191716691 |
| Locally Manufactured Equipment | | | | | | | | |
| 1 | End Customer | CPE- (EDFA/Optical Switch/Transmitter/Switch Port etc.) | 527625 | 4540246 | 2673450 | 1007500 | 24170351 | 32919172 |
| 2 | Headend Equipment | CAS- (Meraki Access Point/ Keshet boards/ TED ATO etc.) | 0 | 397331 | 818842 | 0 | 3053440 | 4269613 |
| 3 | Headend Equipment | IRD- (BMD Mini Converters-HDMI to SDI/IRD RX8200 MODULATOR RECEIVER etc.) | 838625 | 1449068 | 717220 | 0 | 0 | 3004913 |
| 4 | Headend Equipment | SMS - (Check Point SG/ LAN Card) | 2327296 | 790 | 4570 | 0 | 0 | 2332656 |
| 5 | Headend Equipment | MUX - (AV to HDMI Converter/ Multi Channel Transcoder GN-1772 etc.) | 182175 | 2047420 | 1945082 | 75,000 | 416980 | 4666657 |
| 6 | Distribution Equipment | Networking | 0 | 2320849 | 3562660 | 0 | 0 | 5883509 |
| 7 | Miscellaneous | Test Equipment | 0 | 0 | 514000 | 0 | 0 | 514000 |

| | | | | | | | | |
|---|---------------|--------------------------------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| 8 | Miscellaneous | Others - (Video conferencing device) | 0 | 0 | 535527 | 0 | 0 | 535527 |
| | | Total | 3875721 | 10755704 | 10771351 | 1082500 | 27640771 | 54126047 |

Table 2.8: Values of Equipment Deployed in MSO-I Network (in Rs.)

| Sl. No. | Category | Description | Year of Purchase | Details of Purchase of the Equipment- MSO 2 | | Total Value (in Rs.) |
|---------------------------------------|----------------------------|--------------------|------------------|---|------------------------|----------------------|
| | | | | No. of units purchased | Per Unit Cost (in Rs.) | |
| Imported Equipment | | | | | | |
| 1 | Headend Equipment | ENCODER SD | 2019 | 12 | 110500 | 1326000 |
| 2 | Headend Equipment | ENCODER HD | 2019 | 9 | 135000 | 1215000 |
| 3 | Headend Network | SWITCH 48 PORT | 2019 | 2 | 245000 | 490000 |
| 4 | Outdoor Plant/transmission | CONNECTORS PUCHING | 2019 | 500 | 125 | 62500 |
| 5 | Headend Equipment | MUX 9902 | 2019 | 1 | 180000 | 180000 |
| | | Total | | 524 | 670625 | 3273500 |
| Locally Manufactured Equipment | | | | | | |
| 1 | Outdoor Plant/transmission | BELDEN WIRE | 2019 | 15 | 12500 | 187500 |
| 2 | Outdoor Plant/transmission | TOOL FOR CRIMPING | 2019 | 2 | 6500 | 13,000 |
| 3 | Outdoor Plant/transmission | TOOL FOR CUTTING | 2019 | 2 | 250 | 500 |
| 4 | Headend Equipment | SMS SERVERS | 2018 | 2 | 250000 | 500000 |
| | | Total | | 21 | 269250 | 701000 |

Table 2.9: Values of Equipment Deployed in MSO-II Network (in Rs.)

2.9 Distinct categories of equipment deployed in television distribution networks have different procurement cycles. For instance, the headend equipment is generally procured at the time of roll-out. Further procurement, if any, occurs only when major expansions or upgrades are undertaken. Whereas Consumer Premise Equipment are required on a regular and recurring basis. Several factors drive the demand of STBs, such as i) extension of television services to uncovered TV households; ii) upgrade from SD to HD; iii) replacement of boxes completing useful life; iv) launch of converged services through hybrid STBs. This can be gauged from the estimated annual demand of 26 million STBs as mentioned in Table 2.4. The transmission equipment procurements are likely to have a variable frequency of purchase, depending upon the network layout and business plan of the distributor. For example, referring to the tree structure of the transmission networks as touched upon in section 1.4.1, upgrading the trunk and branch cable may be required at a lesser frequency than the recurring need for the drop cables to TV homes. Similarly, the need for EDFA, RF amplifiers, optical nodes, etc., will depend upon the network topography.

Issue for consultation: Apropos the discussion above, the issue for consultation is:

Q10. Is there potential for promoting local manufacturing of all types of broadcasting equipment, more specific to television broadcasting equipment e.g. head-end, transmission, CPE etc. or at this stage the industry should focus on specific segment like Customer Premises Equipment / Set-Top Box? Please specify the segment (if any) and support your answer with relevant market size in terms of value and volume.

CHAPTER 3

POLICY INITIATIVES BY THE GOVERNMENT TO PROMOTE LOCAL MANUFACTURING

3.1 India has a large and growing electronics market covering multiple service segments, such as communication and broadcasting, consumer electronics, industrial electronics, strategic electronics, computer hardware, electronic components, etc. The domestic demand for electronics hardware is expected to rise rapidly to about Rs. 29,304 crores by 2025.²⁵ The Indian Government attaches high priority to electronics manufacturing. Under the flagship initiatives – ‘Make in India’ and ‘Digital India’, the government has put special focus on transforming the country into a global manufacturing hub. Electronics manufacturing is one of the main priority areas identified under the initiatives.

3.2 The previous chapter touched upon the levels of local manufacturing in the television broadcasting sector in India. As per domestic electronics hardware manufacturers, they suffer from a lack of level-playing field vis-à-vis manufacturers from other countries in terms of several factors such as lack of required infrastructure; poor domestic supply chain and logistics; higher cost of capital and finance, etc. These concerns are discussed in more detail in Chapter 4. The electronics hardware manufacturing sector suffers disability of around 8.5% to 11% in terms of pricing, as compared to the competing nations.²⁶ However, the government in recent years has launched multiple initiatives for promoting local manufacturing. Such initiatives include rationalization of tariff structure and increasing Basic Customs Duty (BCD) on Mobile Phones, LED Lights, Flat Panel TVs, Set Top

²⁵ Annual Report (2020-2021), Ministry of Information and Broadcasting, available at: <https://mib.gov.in/sites/default/files/Annual%20Report%202020-21.pdf>

²⁶ Available at: <https://www.meity.gov.in/esdm/pli#:~:text=The%20sector%20suffers%20disability%20of,a nd%20inadequacies%20in%20skill%20development.>

Boxes (STBs), Energy Meters, and Microwave Ovens, etc. This has led to an increase in the manufacturing of these products and their components.²⁷

3.3 Recognizing the electronics sector's unique dynamics, significant opportunity, and structural challenges, the policy initiatives that are undertaken by the government to assist the electronics industry broadly fall into four categories²⁸: (i) schemes to promote domestic industry; (ii) schemes to promote innovation; (iii) tax and tariff concessions/regimes applying to specific products and (iv) schemes aimed at skill development. Various schemes/initiatives of the government have been discussed in the following section.

3.4 **National Policy on Electronics in 2012 (NPE 2012):**

3.4.1 National Policy Electronics, 2012 (NPE 2012), was a momentous initiative of the government of India to boost local manufacturing of electronics in India which further launched multiple schemes under it. The first step to create an ecosystem for a globally competitive Electronic System Design and Manufacturing (ESDM) sector in the country was through NPE, 2012.

3.4.2 The main objectives of NPE 2012 include net-zero import by 2020, turnover of \$400 million by 2020 with an investment of \$100 million, generating 28 million jobs, building a strong supply chain of raw materials, parts, and electronic components, etc.

3.4.3 Under NPE 2012, the government specifically mentioned 'information and broadcasting sector' by aiming to create an ecosystem for manufacturing of set-top boxes and other broadcast equipment in the country as part of the digitalization of the

²⁷MEITY Annual Report: 2019-2020; Available at: https://www.meity.gov.in/writereaddata/files/Annual_Report_2019%E2%80%932020.pdf

²⁸ Niti Aayog, Make in India Strategy for Electronic Products, May 2016; Available at: http://www.niti.gov.in/writereaddata/files/document_publication/Electronics%20Policy%20Final%20Circulation.pdf

broadcast network of the country.²⁹ The government aimed to create a viable ecosystem to attract Indian and foreign companies to invest in the nation's electronics and IT hardware sector.

3.5 National Policy on Electronics, 2019 (NPE, 2019):

3.5.1 While NPE 2012 introduced relevant and well-intentioned schemes and initiatives of the government, certain revisions were required in the framework in order to further strengthen the ecosystem of the electronics sector in India to keep up with the dynamics of the industry.

3.5.2 NPE 2019, notified on 25th February 2019; aims to position India as a global hub for ESDM by encouraging and driving capabilities in the country for developing core components, including chipsets, and creating an enabling environment for the industry to compete globally.

3.5.3 The key themes in the NPE, 2019, are the development of a component manufacturing ecosystem, fiscal incentives for the ESDM sector, promoting research and development (R&D), etc. The policy offers an all-encompassing yet high-level outline of the Government's idea to support the electronics manufacturing industry.

3.5.4 Major schemes and policies envisaged under NPE 2019 to boost local manufacturing in the electronics industry are described below:

a. Electronics Manufacturing Clusters (EMC) Scheme

Under the aegis of NPE, 2019, a modified Electronics Manufacturing Clusters Scheme (EMC 2.0) was approved for further strengthening the infrastructure across the electronics value chain in the country. The objective of EMC 2.0 is to support establishing EMCs and Common Facility Centers (CFCs) in areas where a significant number of existing manufacturing units are located. As an outcome, the government aims

²⁹Paragraph 8.7, National Policy on Electronics, 2012; Available at: https://www.meity.gov.in/writereaddata/files/NPE_Notification.pdf

to create an entire ecosystem of electronic products at a location that will aid competitiveness and help exports.

Till December 2020, MeitY has received 46 applications under the scheme for setting up of Greenfield EMCs and 4 applications for setting up of Common Facility Centers (CFC) in Brownfield Clusters from 19 States across the country. Of these, 19 Greenfield EMCs and three Common Facility Centers (CFCs) have been approved, measuring an area of 3,464 acres with a project cost of Rs.3,743 crore, including Grant-in-aid of Rs.1,527 crore from the Government of India. These EMCs are poised to attract an investment of Rs.52,000 crore and are expected to generate 6.30 lakh employment opportunities in the coming years.³⁰

b. Electronics Development Fund (EDF)

As per NPE, 2019, at least 50% of the corpus has to be invested in ventures working in the ESDM sector. NPE 2019 states that EDF will be investing in 13 Daughter Funds. The total targeted corpus of these 13 Daughter Funds is INR 6,950 crore, and the amount committed by EDF to these 13 Daughter Funds is INR 857 crore.³¹

Up to 31st December 2020 EDF has invested Rs.164.24 crore in seven Daughter Funds, which in turn have made total investments of Rs.697.03 crore in 88 Ventures/Start-ups. Approximately Rs. 6425 crores have been raised by the supported start-ups of the Daughter Funds. Total employment of about 12,200 has been generated in supported Start-ups.³²

³⁰ MeitY Annual Report: 2020-2021, available at: https://www.meity.gov.in/writereaddata/files/MeitY_AR_English_2020-21.pdf

³¹ Paragraph 1.4, National Policy on Electronics, 2019; Available at: https://www.meity.gov.in/writereaddata/files/eGazette_Notification_NPE%202019_dated%2025022019.pdf

³² MeitY Annual Report: 2020-2021, available at: https://www.meity.gov.in/writereaddata/files/MeitY_AR_English_2020-21.pdf

The Department of Electronics and Information Technology has agreed to act as the Anchor Investor of the Fund under the EDF scheme.³³

c. Preferential Market Access Policy (PMA)

In order to further the PMA policy, NPE 2019 encourages State Governments to undertake the Public Procurement (Preference to Make in India) Order 2017 for procuring electronic products. Furthermore, NPE 2019 aims to leverage Government e-Market Place (GeM) to create/expand the market for domestically manufactured electronic products.³⁴ In furtherance of the aforesaid Public Procurement (Preference to Make in India), Order 2017; DoT had notified a list of telecom products, services, and works which have sufficient local capacity and local competition vide notification dated 29th August 2018.³⁵ The said list of products included Set-Top boxes along with its Preference to Make in India (PMI), i.e., 50% (2019-20) and the Local Content (LC), i.e., 55% (2019-20). However, vide the latest notification by DoT dated 31st August 2021³⁶ in supersession of the earlier notifications, the list of products has been revised. The revised list does not include set-top boxes.

d. Tax Regime

In order to advance the ESDM sector, NPE 2019 envisions suitable tax benefits to the said sector along with a stable tax regime, including advance intimation to the industry to design their investments in the

³³ Available at: <http://www.edfindia-canbankventure.com/about-edf.php>

³⁴ Paragraphs 5.20-5.21, National Policy on Electronics, 2019; Available at: https://www.meity.gov.in/writereaddata/files/eGazette_Notification_NPE%202019_dated%2025022019.pdf

³⁵ Available at: <https://dpiit.gov.in/sites/default/files/Department%20of%20Telecommunications%20Notification%20dated%2029082018.pdf>

³⁶ Available at: https://dot.gov.in/sites/default/files/Public%20Procurement%20Notification2_0.pdf?download=1

form of Phased Manufacturing Programme (PMP) in different sections of electronics, with a sunset clause.³⁷

e. Schemes aimed at Skill development

NPE 2019 aims for human resource and skill development by promoting works with the Government, industry, and institutions of learning to ensure the availability of skilled manpower by supporting emerging technology areas like 5G, IoT/Sensors, Artificial Intelligence (AI), Machine Learning, etc.³⁸

3.6 In 2020, the government of India announced the launch of three electronics manufacturing schemes in order to further the objectives of NPE 2019 as follows:

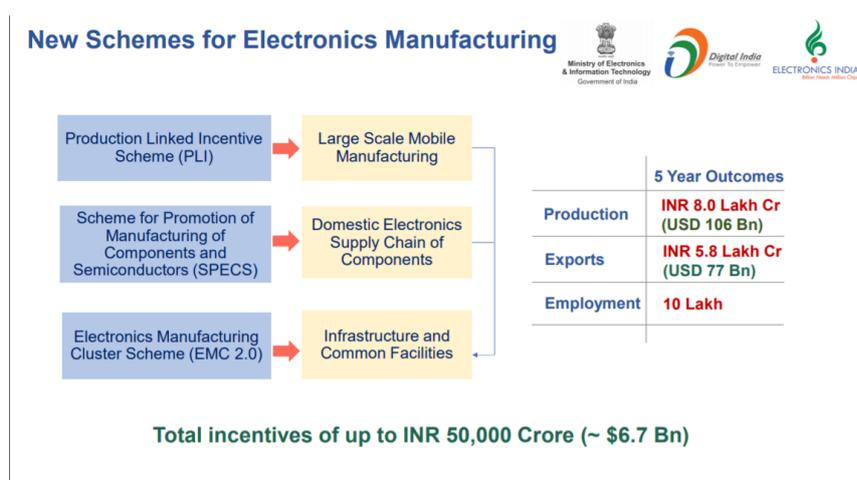


Figure 3.1: Electronics Manufacturing Schemes launched in 2020

Source: MeitY³⁹

While EMC 2.0 has already been discussed in para 3.5.4(a) above, the other two schemes are discussed below.

³⁷Paragraph 5.1.8, National Policy on Electronics, 2019; Available at: https://www.meity.gov.in/writereaddata/files/eGazette_Notification_NPE%202019_dated%2025022019.pdf

³⁸National Policy on Electronics, 2019; Available at: https://www.meity.gov.in/writereaddata/files/eGazette_Notification_NPE%202019_dated%2025022019.pdf

³⁹Available at: https://www.meity.gov.in/writereaddata/files/Presentation-Electronics_Manufacturing_Schemes.pdf

3.6.1 Production Linked Incentives (PLI)

Production Linked Incentive Scheme (PLI) for large-scale electronics manufacturing, notified on April 01, 2020⁴⁰, offers a production linked incentive to promote domestic production and to attract bigger investments in mobile phone manufacturing and specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units. The scheme is expected to greatly enhance the electronics manufacturing landscape and place the Indian market at a prominent level globally in the electronics sector. The scheme shall extend an incentive of 4% to 6% on incremental sales (over a base year) of goods manufactured in India and covered under target segments, to eligible companies, for five years after the base year as defined (FY 2019-20). Incentives are applicable under the scheme from 1st August 2020. The creation of domestic champion companies in electronics manufacturing under the Scheme is expected to give a fillip to vocal for local while aiming for global scale.⁴¹

New developments under the PLI scheme have been outlined below:

- i. In 2020, the Union Cabinet had given its approval to introduce the PLI Scheme worth 1.46 lakh crore in 10 key sectors for Enhancing India's Manufacturing Capabilities and Enhancing Exports under Atmanirbhar Bharat Abhiyan (discussed below). The sectors include automobiles and auto components, pharmaceutical drugs, advanced chemistry cell (ACC) battery, capital goods, electronic/technology products, textile products, white goods (ACs & LED), food products, telecom and networking products, and specialty steel.⁴²
- ii. The Commerce Ministry stated that for the quarter ending December 2020, electronics manufacturing companies that have applied for

⁴⁰ Notified vide Gazette Notification No.CG-DL-E-01042020-218990 dated April 01, 2020

⁴¹ Available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=1642823>

⁴² Available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=1671912>

the scheme produced goods worth around Rs 35,000 crore and invested around Rs 1,300 crore under the scheme.⁴³

- iii. Further in February 2021, during the announcement of the Union Budget for FY 2021-2022; the Ministry of Finance stated that the PLI schemes to create manufacturing global champions for an Atmanirbhar Bharat would be for 13 sectors, including telecom and networking products.⁴⁴ For this, the government has committed nearly 1.97 lakh crores, over five years starting FY 2021-22.⁴⁵
- iv. The Second Round of the PLI Scheme has been announced in March 2021 under which incentives of 5% to 3% shall be extended to eligible companies on incremental sales (over base year, i.e., 2019-20) of goods manufactured in India and covered under the target segment (specified electronic components) with the incremental investment made in India after 31st March 2021, for four years.⁴⁶
- v. In June 2021, the Ministry of Finance has further announced the extension of the tenure of the scheme by one year till 2025-26, considering that the production in the electronics sector suffered a setback owing to the second wave of the COVID-19 pandemic.⁴⁷
- vi. Department of Telecommunications, Ministry of Communications, in their Guidelines for Production Linked Incentive Scheme (PLI) for promoting Telecom and Networking Products Manufacturing in India, dated 3rd June 2021, have issued the list of Telecom equipment which are covered under the PLI scheme. The list

⁴³Available at: <https://www.financialexpress.com/industry/sme/production-linked-incentive-what-is-modi-govts-pet-qli-scheme-who-is-eligible-which-sectors-have-it/2262391/>

⁴⁴ Available at: <https://businessindia.co/magazine/the-qli-gambit>

⁴⁵ Available at: https://www.indiabudget.gov.in/doc/budget_speech.pdf

⁴⁶Available at: https://www.meity.gov.in/writereaddata/files/Supplementary%20Guidelines%20on%20Second%20Round%20of%20Production%20Linked%20Incentive%20Scheme%20%28PLI%29%20for%20Large%20Scale%20Electronics%20Manufacturing_11.03.2021.pdf

⁴⁷ Available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=1730963>

includes a few types of equipment such as OLT, GPON, ONT, etc.,⁴⁸ which may also be used in the cable broadcasting distribution network. However, no such guideline specific to the broadcasting sector has been issued to date.

3.6.2 Scheme for Promotion of manufacturing of Electronic Components and Semiconductors (SPECS):

In order to create a comprehensive ecosystem for the electronics industry, the government aims at promoting the domestic manufacturing of electronic components and semiconductors. The SPECS scheme was notified on April 01, 2020⁴⁹ and will provide a financial incentive of 25% on capital expenditure for the identified list of electronic goods that comprise the downstream value chain of electronic products, i.e., electronic components, semiconductor/display fabrication units, ATMP units, specialized sub-assemblies, and capital goods for manufacturing of the aforesaid goods, all of which involve high value-added manufacturing.⁵⁰

3.7 Apart from the above-mentioned schemes and initiatives, MeitY had earlier notified “Electronics and Information Technology Goods (Requirement of Compulsory Registration) Order, 2012” (CRO) for mandatory compliance to ensure the safety of Indian citizens by curbing the import of substandard and unsafe electronic goods into India. As per the CRO, no person shall manufacture or store for sale, import, sell or distribute goods that do not conform to the Indian standard specified in the order.⁵¹ Set Top Boxes (STBs) are covered under the CRO.⁵²

⁴⁸ Available at: https://dot.gov.in/sites/default/files/2021_06_03%20PLI%20Scheme%20Guidelines%20for%20Telecom%20%26%20Networking%20Product.pdf

⁴⁹ Notified vide Gazette Notification No.CG-DL-E-01042020-218992 dated April 01, 2020

⁵⁰ Available at: <https://www.meity.gov.in/esdm/SPECS>

⁵¹ Section 3(1), Electronics and Information Technology Goods (Requirement of Compulsory Registration) Order, 2012

⁵² Schedule, Electronics and Information Technology Goods (Requirement of Compulsory Registration) Order, 2012

3.8 In May 2020, amidst the global struggle against the COVID-19 pandemic, the Government of India announced the 'Atmanirbhar Bharat Abhiyan' (meaning the Self-Reliant India Campaign). Considering that the pandemic could have long-term disruptive effects on the productive capacity, the said Abhiyan was announced with welfare measures to address the short-term distress of individuals and firms, and structural reforms to alleviate the long-term distress on the economy⁵³ along with the purpose to boost domestic manufacturing and prepare the country for a tough competition in the global supply chain.⁵⁴ The Ministry of Finance announced a special economic package of INR 20 lakh crore (equivalent to 10% of India's GDP) under the scheme.⁵⁵ The schemes announced till now under the said Abhiyan are generally related to different electronic products from across multiple sectors.

3.9 Tax and tariff concessions applying to specific products

3.9.1 Rationalization of Tariff Structure is an ongoing process. Tariff Structure has been rationalized to promote domestic manufacturing of electronic goods, including, inter alia, Set Top Boxes for TV, Televisions, Cellular mobile handsets, LED products, and medical electronics equipment. As an outcome, investments are rapidly getting attracted into this sector and noteworthy production capacities have been established in the country during the past years.⁵⁶ Table 3.1 depicts the BCD applicable to different electronic items.

⁵³Economic Survey 2020-2021, Ministry of Finance, Available at: https://www.indiabudget.gov.in/economicsurvey/doc/echapter_vol2.pdf

⁵⁴ Available at: <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1623418>

⁵⁵ Available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=1638112>

⁵⁶MEITY Annual Report: 2019-2020, Available at: https://www.meity.gov.in/writereaddata/files/Annual_Report_2019%E2%80%9320.pdf

| S. No. | Item | HS Code | BCD upto 13.12.17 | BCD w.e.f. 14.12.17 |
|--------|--|----------------------|-------------------|--|
| 1 | Cellular Mobile Handsets | 85171210 85171290 | 10% | 15% (further increased to 20% in Budget 2018-19) |
| 2 | Set Top Box for Television | 85287100 | 10% | 20% |
| 3 | Colour Televisions | 852872 | 10% | 20% |
| 4 | Microwave Ovens | 85165000 | 10% | 20% |
| 5 | Digital Video Recorder (DVR)/ Network Video Recorder (NVR) | 85219090 | 10% | 15% (further increased to 20% in Budget 2019-20) |
| 6 | CCTV Camera/ IP Camera | 852580 | 10% | 15% (further increased to 20% in Budget 2019-20) |
| 7 | Light Emitting Diode (LED) Lamps | 85395000 | 10% | 20% |
| 8 | Smart Meters | 902830 | 10% | 15% |
| 9 | w.e.f. 30.01.2019, BCD on Power Banks (HS 85076000) has also been increased from 10% to 20%. | | | |

Table 3.1: Key Tariff Interventions to Promote Domestic Manufacturing of Electronic Goods

Source: Annual Report 2019-2020, MeitY

3.9.2 Parts, components, and accessories except (i) Populated Printed Circuit Boards (PPCBs) and (ii) Charger or Power Adapter for use in the manufacture of STBs for TVs are exempted from BCD. Sub-parts for use in the manufacture of these parts, components, and accessories are also exempted from BCD.⁵⁷ BCD on Populated Printed Circuit Boards (PPCBs) of STBs is 10%.⁵⁸

3.10 The policy reforms and prominent developments in the business regulatory framework have had a profound effect on the expansion of India's capacity to attract FDI and trade in the manufacturing sector. Further, India was ranked as one of the 10 most improved economies in terms of ease of doing business in the World Bank's Doing Business 2020 report, especially due to reforms in resolving insolvency, starting a business, and trading across borders.⁵⁹ But the impact of such initiatives on the domestic manufacturing sector needs to be examined,

⁵⁷ Notification No.50/2017-Customs dated 30.06.2017, as amended from time to time.

⁵⁸ Notification No.50/2017-Customs dated 30.06.2017, as amended from time to time.

⁵⁹"Doing Business 2020", World Bank, Available at: <https://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf>

which will be useful in the review of the way forward for promoting domestic manufacturing in the television broadcasting sector.

3.11 **Issues for consultation:** Apropos the discussion above, the issues for consultation are:

Q11(a). Do the existing policy measures and fiscal initiatives adequately address the needs of the Indian Television Broadcast manufacturing sector?

Q11(b). If yes, please provide supporting note(s) to your answer.

Q11(c). If the answer to Q11(a) is negative, what policy measures are required to boost local electronics manufacturing in the television broadcasting equipment sector? Please provide details in terms of short-term and long-term objectives.

Q12. Should the government extend the PLI scheme to the television broadcasting sector? Which equipment deployed in the television broadcast network should be covered under the PLI scheme? Please elaborate with supporting note(s).

CHAPTER 4

ISSUES AND CHALLENGES IN LOCAL MANUFACTURING – INDUSTRY STAKEHOLDER VIEW

4.1 The previous chapters have touched upon the evolution of the television broadcast sector in India. The transformation and the exponential growth witnessed in the sector post digitalization have been discussed. The existing level of local manufacturing in the television broadcast sector, extant government policies and initiatives to assist the domestic electronic manufacturing sector have also been dealt with. Based on these discussions, few important observations emerge. First, it is seen that there is a huge demand potential in the sector, which is still far from saturation level, as far as 100% coverage of households is concerned. It has also been discussed that there are wide-ranging policy measures in place to assist the broader electronic manufacturing sector, even if not specifically focused on the television broadcasting sector. Further, it has also emerged that despite the extant policy measures, the television broadcast sector is predominantly dependent upon import for the deployment of equipment in the distribution networks; the share of locally manufactured equipment being to a limited extent. These observations raise the question regarding the constraints that have prevented the local manufacturing sector from capturing a greater market share of the substantial demand generated by the sector. Based on the preliminary inputs from industry stakeholders, the following sections attempt to summarize such constraints.

4.2 At a broad level, some of the major concerns pertain to the quality of the final products, cost of the products, and the scale of production. Further, the lack of adequate Research and Development (R&D) in the sector is another area of concern for local production of television broadcasting equipment. These factors hamper the demand for locally manufactured equipment. Without adequate demand, the scaling up of production of local equipment would not be incentivized, which in turn would not incentivize R&D in this sector. The need for a strong R&D ecosystem is flagged as one

of the key factors for promoting local manufacturing in the broadcasting sector. However, it may be appropriate to mention here that issues related to R&D and innovation are being taken up separately through another consultation paper being brought out by TRAI that will focus on R&D issues in detail.

4.3 Simply put, competitively priced products of acceptable quality shall boost the demand for local equipment, which should further stimulate the scale of production of the television broadcasting equipment. However, certain key issues such as high capital costs, lack of financing options to the manufacturers, a heavy reduction in import tariffs in India, etc., act as roadblocks for the Indian industry to meet these objectives. Lack of adequate infrastructure, absence of a strong supply chain and logistics, limited value addition, inadequate availability of parts and components at the local level, etc., are some other important issues reportedly besetting the local manufacturing industry in the television broadcasting sector.

4.4 Based on interactions with the industry stakeholders, some of the major concerns afflicting the Indian broadcast manufacturing sector are summarized below:

a) Heavy reliance on components from other countries: Imports of components from China and Southeast Asian markets have dominated the supply chain in the television broadcasting industry, which adds to the cost of locally manufactured equipment. Due to this, on one hand, and the FTAs, on the other, the imported product becomes available at a lower cost compared to the local products, adversely impacting the demand for domestic products. This further affects the scalability of local production and the cost competitiveness of domestic products.

b) Competing nations offering High Incentives/ Subsidies: Manufacturers in other countries, e.g., China, have the advantage of the availability of finance at convenient terms for components used in the electronics sector. In comparison, the Indian industry does

not have the benefit of easy access to financial support on similar terms. Further, loans are provided for exporting components from China to Vietnam to the Chinese companies, which manufacture in Vietnam. Although the STB manufacturing ecosystem is fairly established in India, with only about 40% of components being obtained locally, manufacturers face production cost challenges, where they get competition from global companies. Components that are predominantly imported include ICs, PCBs, remote control cards, software components like CAS, passive components, etc. As per EY report⁶⁰ the current cost of equity in India is estimated to be about 14% (13.61% for IT/ITES sector). With recent softening of prime lending rates (PLR), stakeholders during their interactions with TRAI have also indicated that cost of equity in India is between 10% to 12%. As per EY report⁶⁰, average differential in cost of capital in India compared to developed countries is 3%, which is substantial.

c) Dependence on foreign Conditional Access System (CAS): As discussed earlier, CAS is a proprietary component, whose manufacturing has been historically dominated by large foreign vendors from the US, Europe, and China. For STB manufacturing, there are contract manufacturers developing the core chipsets and components and software applications. However, there was limited expertise in India to develop conditional access system (CAS) boxes till some time back. The development of Indian CAS was expected to break this dependence and enable the adoption of local STBs. However, due to techno-commercial reasons, the availability of local CAS has so far not been able to boost the demand for Indian STBs as anticipated.

⁶⁰ The Cost of Capital Survey: India Insights 2021 by EY, available at: https://assets.ey.com/content/dam/ey-sites/ey-com/en_in/topics/strategy-transactions/2021/cost-of-capital-survey-report-2021.pdf?download

d) Low value addition: Due to the value chain immaturity in India, domestic manufacturing here focuses primarily on last-mile assembly. In India, OEM/ODM (Original Equipment Manufacturing /Original Design Manufacturing) and local suppliers of components are still in their nascency. Most of the OEM is limited to low-value addition, and this last mile assembly suggests that the industry is still in the primary stages of making. While most of the manufacturing happens in CKD (Completely Knocked Down)/SKD (Semi-Knocked Down) Form with some level of localization, high-end products are imported in CBU (Completely Built Up) form. Most of the EMS (Electronic Manufacturing Services) and OEMs are mainly undertaking last-mile assembly, and not much designing (R&D) is undertaken in the country.

e) Impact of trade agreements with other countries: As a consequence of India being a party to ITA (Information Technology Agreement), WTO treaties, and Foreign Trade Agreements (FTA), the import costs became lower than the local manufacturing costs for many products. This, in turn, made it harder for the domestic manufacturers to stay cost-competitive.

- i. **ITA:** As an upshot of the execution of the IT Agreement (ITA 1) of the WTO, the domestic IT hardware and electronics manufacturing sector was hit first by the zero-customs duty system. Under ITA-1, each member agreed to eliminate customs duties and other duties and charges of any kind within the meaning of Article II, clause 1 (b) of Central Agreement on Tariff and Trade, 1994. India joined ITA on 25th March 1997. 217 tariff lines were brought down to zero since 2005, which has resulted in acceleration of ITA imports.⁶¹ The ITA covers a large number of high technology products, including computers, telecommunication equipment, semiconductors, semiconductor

⁶¹ Available at: https://www.wto.org/english/tratop_e/inftec_e/itaintro_e.htm

manufacturing and testing equipment, software, scientific instruments, as well as most of the parts and accessories of these products.⁶²

- ii. **FTA:** India had become party to a Free Trade Agreement (FTA)/Preferential Trading Agreement (PTA) with multiple countries and more negotiations in the form of agreements were in place in which the electronics hardware from these countries shall be imported at a preferential rate of duty, which is lower than the usual rate of tariff. FTAs signed by India are with production-driven economies like Taiwan and Japan.⁶³

Consumer electronics and home appliances are facing an inverted duty structure due to the introduction of FTAs, where the finished product is imported at 0 percent concessional import duty, while components import attract around 7.5 percent-10 percent customs duty, thus making the final product more costly than the imported product.

- iii. **ASEAN FTA:** Imports from ASEAN countries (primarily Vietnam and Thailand) cover a large percentage of the Indian STB industry. However, these STBs are manufactured or redirected to India from such markets by Chinese companies in Vietnam and other ASEAN countries to exploit the FTA (i.e., without much value addition (VA) being done in those countries and meeting the minimum 35 percent VA stipulation as mentioned in the India-ASEAN FTA).

- f) **Buyer's credit given to Indian importers of STBs:** Indian importers are allowed to avail buyer's credit for import for three years. According to CEAMA, Chinese companies in Vietnam produce STBs and export at 0% duty to India. Using easy credits issued by Chinese banks with a mandate to promote exports, Chinese

⁶² Available at: https://www.wto.org/english/tratop_e/inftec_e/itaintro_e.htm

⁶³ PricewaterhouseCoopers (PwC) and Consumer Electronics and Appliances Manufacturers Association (CEAMA) Report on Future of consumer durables and electronics in India: the changing landscape, 2018

companies procure components from China. In the form of buyer's credit, the bank financing used by Chinese companies for component procurement is passed on to Indian importers (cable operators and DTH operators). As Indian banks do not provide buyer's credit for STBs, this makes importing more worthwhile than purchasing from Indian suppliers for the Indian STB importers.

g) Infrastructural concerns: Such as freight costs and logistics costs as well as challenges in availability of quality power, land, and labour at affordable rates, also create impediments for local manufacturing in the sector.

4.5 Issues for consultation: Apropos the discussion above, the issues for consultation are:

Q13. There is a need to have a standard understanding of the scope of 'local manufacturing' amongst all the stakeholders to bring uniformity in the consultation. What should be the scope and definition of 'local manufacturing' in the lines of manufacturing vis-à-vis assemblage of the television broadcasting equipment and their core components?

Q14. Will a stronger R&D ecosystem enable the growth of local broadcast manufacturing sector? If yes, please suggest steps to promote and incentivize R&D undertaken in India to build domestic capability in television broadcast equipment manufacturing.

Q15. In view of the concerns raised about Free Trade Agreements (FTAs) affecting the cost competitiveness of the local products, what policy measures do you suggest to address this issue? Please elaborate with supporting note(s).

Q16(a). Do you think that there is a cost disparity due to additional expense on infrastructure vis-à-vis competing nations that adds to disadvantage for local manufacturers?

Q16(b). If yes, please elaborate along with supporting inputs and item-wise comparison, such as with reference to availability of power, labour, land, strong supply chain and logistics, etc.

Q 17: Please list (item-wise) the cost disadvantages that an Indian manufacturer faces vis-à-vis its international competitors. Please quantify such disadvantages in percentage terms to enable broad estimation.

Q18. Any other issue you may like to raise relevant to the present consultation?

CHAPTER 5

ISSUES FOR CONSULTATION

Stakeholders are requested to provide their comments on the following issues:

Q1. What is your assessment in respect of local manufacturing in the television broadcast sector of India? Is there requirement for a focused action in promoting local manufacturing in the television broadcast sector? Please elaborate.

Q2. Do you think there is an adequate opportunity, market, and/or demand for the manufacturing of television broadcasting (headend, back haul transmission, CPE and others) equipment in India? Please provide your comments with supporting inputs and data. What are specific requirements of special interfaces and features needed in transmission equipment used in Television broadcasting sector? Elaborate with respect to specific equipment like headend interface equipment and CPE/STB.

Q3(a). Do Indian manufacturers have adequate capabilities to meet the broadcasting (headend, transmission, CPE and others) equipment demand of the Indian cable television sector?

Q3(b). If yes, then what new measures, if any, are required for the local manufacturing sector to capture a greater market share?

Q3(c). If your answer to Q3(a) is negative, then please comment what measures can enable local Industry to consider manufacturing of equipment for broadcasting (headend, transmission, CPE and others) segment? Please provide supporting inputs with relevant details.

Q4. What are the reasons for the limited market share of local STBs? Do the local manufacturers face any entry/exit barriers such as, but not limited to cost competitiveness, and/or technology-related issues? Please elaborate with supporting inputs.

Q5. What measures do you suggest for improving the competitiveness of local manufacturers? Please elaborate your comments with supporting inputs and data.

Q6. What other measures can be taken to encourage the adoption/usage of domestically produced STBs and other Consumer Premises Equipment among the distribution platform operators?

Q7. MeitY supported development of local CAS, which has been available for more than two years. What further measures, if any, should be undertaken to enable increase the market share of local STBs, that are designed in India, running on Indian CAS and made in India? Please elaborate with reasoning.

Q8(a). As per the estimates, yearly broadcasting imports in India amount to more than USD 20 billion. Do you think this market size reflects high potential for local manufacturers for broadcast equipment?

Q8(b) If yes, why the television broadcast sector is still dependent on imports for deployment in networks? Please elaborate.

Q9(a). Looking beyond local markets, can Indian industry gear itself to export television broadcast equipment for export markets?

Q9(b). If yes, what specific measures may be required to enable local manufacturers to compete in global market for television broadcast equipment? Please elaborate with relevant figures and inputs.

Q10. Is there potential for promoting local manufacturing of all types of broadcasting equipment more specific to television broadcasting equipment, e.g. head-end, transmission, CPE etc. or at this stage the industry should focus on specific segment like Customer Premises Equipment / Set-Top Box? Please specify the segment (if any) and support your answer with relevant market size in terms of value and volume.

Q11(a). Do the existing policy measures and fiscal initiatives adequately address the needs of the Indian Television Broadcast manufacturing sector?

Q11(b). If yes, please provide supporting note(s) to your answer.

Q11(c). If the answer to Q11(a) is negative, what policy measures are required to boost local electronics manufacturing in the television broadcasting equipment sector? Please provide details in terms of short-term and long-term objectives.

Q12. Should the government extend the PLI scheme to the television broadcasting sector? Which equipment deployed in the television broadcast network should be covered under the PLI scheme? Please elaborate with supporting note(s).

Q13. There is a need to have a standard understanding of the scope of 'local manufacturing' amongst all the stakeholders to bring uniformity in the consultation. What should be the scope and definition of 'local manufacturing' in the lines of manufacturing vis-à-vis assemblage of the television broadcasting equipment and their core components?

Q14. Will a stronger R&D ecosystem enable the growth of local broadcast manufacturing sector? If yes, please suggest steps to promote and incentivize R&D undertaken in India to build domestic capability in television broadcast equipment manufacturing.

Q15. In view of the concerns raised about Free Trade Agreements (FTAs) affecting the cost competitiveness of the local products, what policy measures do you suggest to address this issue? Please elaborate with supporting note(s).

Q16(a). Do you think that there is a cost disparity due to additional expense on infrastructure vis-à-vis competing nations that adds to disadvantage for local manufacturers?

Q16(b). If yes, please elaborate along with supporting inputs and item-wise comparison, such as with reference to availability of power, labour, land, strong supply chain and logistics, etc.

Q 17: Please list (item-wise) the cost disadvantages that an Indian manufacturer faces vis-à-vis its international competitors. Please quantify such disadvantages in percentage terms to enable broad estimation.

Q18. Any other issue you may like to raise relevant to the present consultation?

Annexure A (Chapter no. 1/ Para no. 1.6.2)

List of CASs currently deployed in India

| Sl. No. | CAS Platform | Country of Origin |
|----------------|----------------------|--------------------------|
| 1 | NDS-Cisco | Israel/US |
| 2 | Nagra-Kudelski | Switzerland |
| 3 | Irdeto | Netherland |
| 4 | Conax-Kudelski | Norway |
| 5 | Verimatrix | US |
| 6 | iCAS-Bydesign | India |
| 7 | Crytogaurd | Sweden |
| 8 | Arris-Latens | US |
| 9 | Safeview | Spain/India |
| 10 | ABV | China |
| 11 | NSTV | China |
| 12 | GosCAS | China |
| 13 | Sumavision | China |
| 14 | LR IPL-Only 1 | India |
| 15 | Logic Eastern-OneCAS | India |
| 16 | Others | Mixed |

Annexure B (Chapter no. 1/ Para no. 1.6.2)

List of SMSs currently deployed in India

| Sl. No | Company/Product Name | Country of Origin |
|---------------|-----------------------------|--------------------------|
| 1. | Aplomb | India |
| 2. | Ask | India |
| 3. | BITS | India |
| 4. | Cryptoguard | Sweden |
| 5. | Drops | India |
| 6. | Efficiense Gospel | China |
| 7. | e-Life | India |
| 8. | Ensurity Dexin | China |
| 9. | iCAS | India |
| 10. | ICORE | India |
| 11. | Impact | India |
| 12. | ITP | India |
| 13. | Jacon | Czech Republic |
| 14. | Kingwon | China |
| 15. | Lightware Digital | India |
| 16. | Logic Eastern | India |
| 17. | Magnaquest | India |
| 18. | Media Nucleus | India |
| 19. | Neeladri Software | India |
| 20. | Paycable | India |
| 21. | Payconnect | India |
| 22. | Preciso | India |
| 23. | Reliable Soft | India |
| 24. | Ridsys | India |
| 25. | SecureTV | China |
| 26. | SkyLink | India |
| 27. | Sprintsoft | India |
| 28. | Synergy | India |

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| 29. | WI Digital | India |
| 30. | Sumavision | China |

LIST OF ACRONYMS

| Sl. No. | Acronym | Description |
|----------------|----------------|---|
| 1. | ACC | Advanced Chemistry Cell |
| 2. | AI | Artificial Intelligence |
| 3. | ASEAN | Association of Southeast Asian Nations |
| 4. | ATMP | Assembly, Testing, Marking and Packaging |
| 5. | AV | Audio/Video |
| 6. | BAT | Bouquet Association Table |
| 7. | BCD | Basic Customs Duty |
| 8. | CAGR | Compound Annual Growth Rate |
| 9. | CAS | Conditional Access System |
| 10. | CAT | Conditional Access Table |
| 11. | CATV | Cable Television |
| 12. | CBU | Completely Built Up |
| 13. | CEAMA | Consumer Electronics and Appliances Manufacturers Association |
| 14. | CFCs | Common Facility Centres |
| 15. | CII | Confederation of Indian Industry |
| 16. | CKD | Completely Knocked Down |
| 17. | CNN | Cable News Network |
| 18. | CPE | Consumer Premises Equipment |
| 19. | CRM | Customer Relationship Management |
| 20. | CRO | Compulsory Registration Order |
| 21. | CTN (R) Act | Cable Television Networks (Regulation) Act |
| 22. | CW | Control Words |
| 23. | DAS | Digital Addressable Systems |

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| 24. | DD | Doordarshan |
| 25. | DFS | Dynamic Frequency Selection |
| 26. | DPO | Distribution Platform Operator |
| 27. | DTH | Direct-to-home |
| 28. | DVB | Digital Video Broadcasting |
| 29. | DVB-C | Digital Video Broadcasting Cable |
| 30. | DVB-S | Digital Video Broadcasting Satellite |
| 31. | DVB-T | Digital Video Broadcasting Terrestrial |
| 32. | ECM | Entitlement Control Message |
| 33. | EDF | Electronics Development Fund |
| 34. | EDFA | Erbium-Doped Fiber Amplifier |
| 35. | EIT | Event Information Table |
| 36. | EMC | Electronic Manufacturing Clusters |
| 37. | EMM | Entitlement Management Message |
| 38. | EMS | Electronic Manufacturing Services |
| 39. | EPG | Electronic Programme Guide |
| 40. | ESDM | Electronics System Design and Manufacturing |
| 41. | FM | Frequency Modulation |
| 42. | FTTH | Fiber to the Home |
| 43. | FTA | Free-to-Air/ Foreign Trade Agreements |
| 44. | GDP | Gross domestic product |
| 45. | GeM | Government e-Market |
| 46. | GPON | Gigabit Passive Optical Network |
| 47. | HD | High Definition |

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| 48. | HDMI | High-Definition Multimedia Interface |
| 49. | HFC | Hybrid Fibre Coax |
| 50. | HITS | Headend In The Sky |
| 51. | ICs | Integrated Circuits |
| 52. | iCAS | Indian Conditional Access System |
| 53. | INR | Indian Rupee |
| 54. | IPTV | Internet Protocol Television |
| 55. | IRD | Integrated Receiver/Decoder |
| 56. | ISP | Internet service provider |
| 57. | IT | Information Technology |
| 58. | ITA | Information Technology Agreement |
| 59. | LCN | Logical Channel Number |
| 60. | LCO | Local Cable Operators |
| 61. | LED | Light Emitting Diodes |
| 62. | LNB | Low-Noise Block |
| 63. | MeitY | Ministry of Electronics and Information Technology |
| 64. | MIB | Ministry of Information and Broadcasting |
| 65. | MSO | Multiple System Operators |
| 66. | NIT | Network Information Table |
| 67. | NLE | Non-Linear Editing |
| 68. | NPE | National Policy on Electronics |
| 69. | ODM | Original Design Manufacturer |
| 70. | OEM | Original Equipment Manufacturer |
| 71. | OF | Optical Fiber |

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| 72. | OLT | Optical Line Termination/ Terminal |
| 73. | ONT | Optical Network Termination |
| 74. | PAT | Program Association Table |
| 75. | PCBs | Printed Circuit Boards |
| 76. | PDA | Personal Digital Assistant |
| 77. | PID | Packet IDentifier |
| 78. | PLI | Production Linked Incentives |
| 79. | PMA | Preferential Market Access |
| 80. | PMP | Phased Manufacturing Programme |
| 81. | PMT | Program Map Table |
| 82. | PON | Passive Optical Network |
| 83. | PPCB | Populated Printed Circuit Boards |
| 84. | PSI | Program Specific Information |
| 85. | QAM | Quadrature Amplitude Modulator |
| 86. | QPSK | Quadrature Phase Shift Keying |
| 87. | R&D | Research and Development |
| 88. | RF | Radio Frequency |
| 89. | SAS | Subscriber Authorization System |
| 90. | SD | Standard Definition |
| 91. | SDT | Service Description Table |
| 92. | SKD | Semi-Knocked Down |
| 93. | SMS | Subscriber Management System |
| 94. | SoC | System on Chip |
| 95. | SPECS | Scheme for Promotion of manufacturing of Electronic Components and Semiconductors |

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| 96. | STB | Set-top box |
| 97. | SW | Shortwave |
| 98. | TRAI | Telecom Regulatory Authority of India |
| 99. | TV | Television |
| 100. | USD | United States Dollar |
| 101. | VA | Value Addition |
| 102. | WDM | Wave Division Multiplexing |
| 103. | WTO | World Trade Organization |