

Indian Standardizations Landscape

“Priority Sectors – Automotive, Electrical Equipment including Consumer Electronics, Smart City, ICT

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1. Revision History

S. No.	Edition	Release year	Pdf Version
1	1 st edition	July, 2013	- Report - Presentation
2	2 nd edition	December, 2017	- Report - Presentation
3	3 rd edition	March, 2021	-

2. Context

One of the pivotal reports prepared by the Seconded European Standardization Expert in India (SESEI) is the **“Indian Standardization Landscape Report”**. The first edition of this comprehensive report was presented during the SESEI Phase 2 (January 2013 – March 2016). Standards development mechanism in India until few years ago was obscure and the standards making bodies were fragmented. This report provided a deep insight into the Indian Standards development system and the important government bodies engaged in the standards development process, concerning the Project priority sector of ICT, Automotive, Electrical Equipment including Consumer Electronics, Smart Cities and keep track on other topics such as Intellectual Property Rights (IPR), Energy Efficiency with special emphasis on Resource Efficiency & Circular Economy, Make in India etc.

The report succeeded in its objective of capturing the Indian Standards development system and the role of industry, policy makers and the academia for the benefit and better understanding of the readers. This awareness of the Indian standards ecosystem was crucial for the Project partners to forge ahead with the Project SESEI and align with the appropriate Indian players for collaboration in areas of mutual interest and harmonization in important areas of standardization.

As a growing economy, India witnessed unprecedented growth in important infrastructure sectors owing to various important missions and projects which were kick started by the new Indian Government such as Make in India, 100 Smart Cities, National Electric Mobility Mission, Smart Grid mission, Start-Up India, Renewable energy power production and many more, which were launched to bring India in line with the developed countries and attract the foreign investments to boost the economy in India.

The second edition of the report was released in December 2017, during the SESEI phase 3. In this 2nd edition, we had captured various policy announcements, legislation/ACT amendments as carried out by the Indian government to strengthen the Standards activities in India.

The year 2020, economies across the world plunged into deep contractions and India was no different. A nationwide lockdown was imposed in India in late March 2020. It was one of the stringent lockdowns enforced allowing only some essential services and activities. India’s \$2.9 trillion economy remained shuttered during the lockdown period & the lockdown created devastating impacts on an already slowing economy and people’s livelihoods as shops, eateries, factories, transport, services, and business establishments were shuttered.

Government of India announced Rs. 2.65 lakh (US\$ 36 billion) stimulus package to generate job opportunities and provide liquidity support to various sectors such as tourism, aviation, construction and housing. Also, India's cabinet approved the production-linked incentives (PLI) scheme to provide ~Rs. 2 trillion (US\$ 27 billion) over five years to create jobs and boost production in the country. The Union Budget aimed at energising the Indian economy through a combination of short-term, medium-term, and long-term measures.

We are now happy to present the 3rd edition of this Indian Standardization Landscape report, encapsulating the significant changes, announcements, policy papers and regulations around our priority sectors as announced by the Government of India through its various ministries for a period starting 2015 until December 2020.

3. Executive Summary

As part of the deliverables of SESEI IV, it has been our endeavour to provide wholistic overview of the Indian standardization ecosystem. The third edition of the Indian Standardization Landscape report is all-encompassing, having elements of the 1st and 2nd edition of the report, making it an inclusive read. This report covers not only information of the important standardization bodies in India, but also the main players influencing the standards development process and the new policies announcements and programmes launched by Indian government until December 2020.

The new initiatives and programmes which have been announced by the government are technology driven and global in their outlook. This necessarily involves creating a conducive regulatory and policy environment for faster deployment of these mammoth projects, creation of sustainable infrastructure & ecosystem, ensuring investments and coherence with the other countries on a global level.

The first section of this report is dedicated to the main standardization bodies in India and give you a quick recap of their latest structure, activities, and scope of work.

It is pertinent to note that Bureau of Indian Standards (BIS) is the National Standards body functioning under the aegis of Ministry of Consumer Affairs, Food and Public Distribution, Govt. of India. BIS through its 16 Division Councils is engaged in formulation of Indian Standards for various sectors such as Production & General Engineering, Chemicals, Civil Engineering, Electronics & Information Technology, Electro-technical, Food and Agriculture, Mechanical Engineering, Management and Systems, Transport, Services, Medical Equipment and Hospital Planning, Metallurgical Engineering, Textile, Water Resources and Petroleum Coal and Related Products etc.

However, there are other industries and professional bodies which formulate sector specific standards, which may be referred as Standards Developing Organizations (SDOs). The statutory provisions given under Section 10 (2) (c) of the BIS Act 2016 and Section 30 of the BIS Rules, 2018 confer upon BIS, powers to recognize any Standards Developing Organization in India for development of standards. Details of these [Indian Standards development organisations \(SDO\)](#), concerning various sectors is also provided in this report.

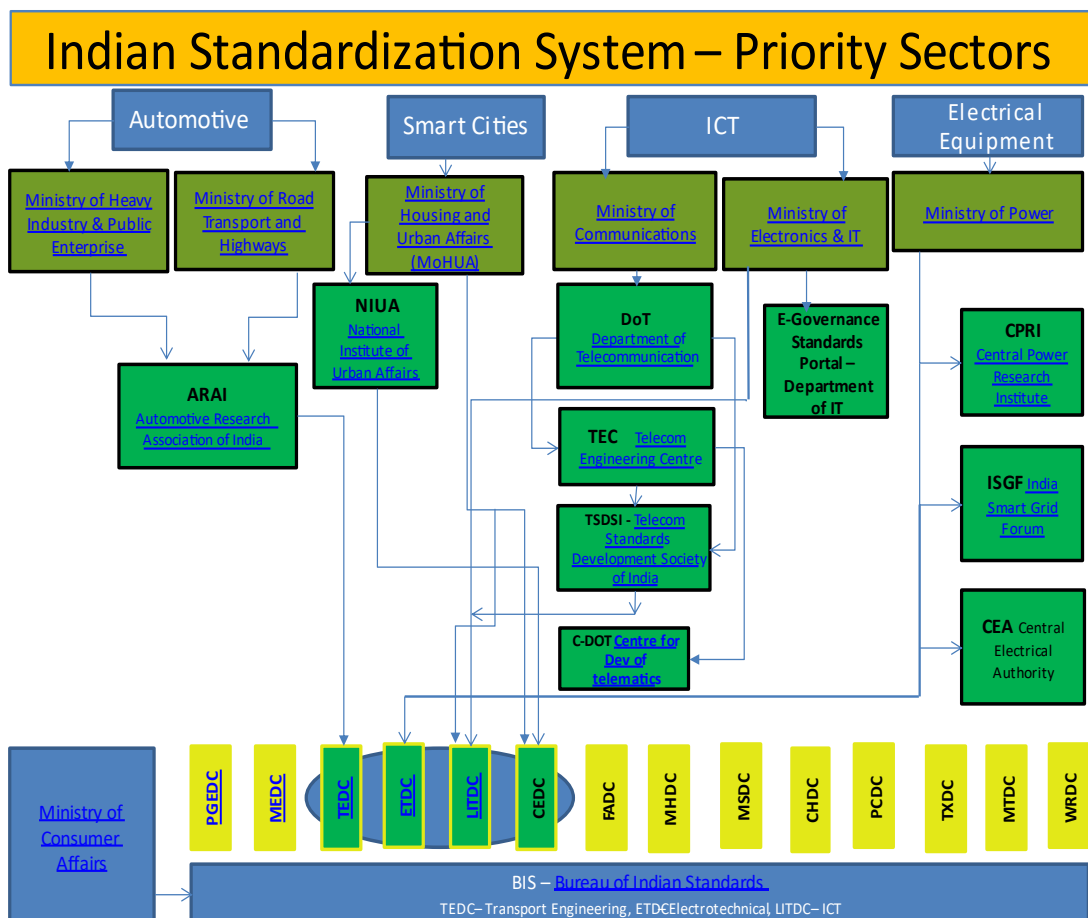
The other two main standards making bodies of India apart from Bureau of Indian Standards (BIS), are Telecom Engineering Centre (TEC) under Department of

Telecommunications (DoT), Ministry of Communications (MoC) and Telecommunications Standards Development Society of India (TSDSI) recognized by DoT, MoC.

TEC through its various working groups such as M2M working groups is undertaking studies to finalize Indian standards/specifications in M2M/ IoT domain preferably based on Global standards such as oneM2M, 3GPP, ETSI etc. So far, TEC has released [13 M2M/IoT technical reports](#) detailing sector specific requirements/use cases to carry out gap analysis and future action plans with possible models of service delivery.

Technical activities of TSDSI are conducted in two Study groups, namely, Study Group-Networks and Study Group-Services & Solution. TSDSI has released [9 technical reports](#) on M2M Use Cases in various verticals from Indian Context.

BIS is a member of Global standardization bodies such as ISO, IEC, JTC1 whereas TEC as an engineering wing of DoT, contributes towards ITU (International Telecommunication Union) and TSDSI is a member of 3GPP and oneM2M. In TSDSI creation, ETSI along with 3GPP extended initial support & guidance through Project SESEI and was one of the first Global SDO to sign Letter of Intent (LoI) providing support and cooperation to the new Indian Telecom Standardization body. TSDSI is a constituent SDO of Global Standards Collaboration (GSC) and Partner Type I of oneM2M - one of the leading forums driving M2M service layer standards as well as it is one of the Seven Organizational Partners of 3GPP.



The policies and legislations are defined by the concerned Union Ministry, however in reality this means that even within a ministry, several departments may be involved in standards and regulations with their areas of competence. Participation from academia, concerned trade association representatives and select relevant private sector experts in the standardization process is equally important.

An era of new reforms and growth started back in 2014 with the arrival of new government. The Government led by Prime Minister Shri Narendra Modi promised to be decisive and firm. The Government has undertaken many reform-oriented measures like building a national consensus and introducing a bill to amend the constitution to implement the Goods and Services Tax (GST), launching flagship programmes such as Smart Cities Mission, Make in India, Swachh Bharat Abhiyan, Digital India, Skilled India, Self-reliant India and many more so that the real image and potential of India is explored.

These new reforms and initiatives are duly supported by policies, Acts and regulations as announced by the government time to time. The second section of this report has captured details of these new reforms and the policies as announced to provide you with the perspective of the “New India” around project priority sectors.

The BIS also released a [Standards National Action Plan \(SNAP\)](#) in March 2019. The plan supplements the [Indian National Strategy for Standardization \(INSS\)](#) which the Indian Ministry of Commerce and Industry released in 2018. Through an assessment of social and economic needs in India, the plan prioritised standardization areas for future of standards development which should ensure sustainability, smartness, and services. Considering growing role of Standards Developing Organisations (SDOs) in India, the SNAP also announced its plan to introduce a scheme for accreditation or recognition of SDOs which shall ensure a coordinated and harmonised standards development in India.

Consumer Protection being one of the fundamental objectives of Ministry of Consumer Affairs, the landmark Consumer Protection Bill, 2019 aims to provide the timely and effective administration and settlement of consumer disputes. The Consumer Protection bill covers, E-Commerce Transactions, revised pecuniary limits, E-Filing of complaints, establishment of Central Consumer Protection Authority, product liability & penal consequences, provisions related to Unfair Trade Practices, Penalties for Misleading Advertisement, etc.

The Government has fast-tracked reforms in the telecom sector and continues to be proactive in providing room for growth for sector stakeholders. The Government through its initiatives continued enablement of easy market access to telecom equipment manufacturers, and a fair and proactive regulatory framework, to ensure availability of telecom services to consumer at affordable prices. The deregulation of Foreign Direct Investment (FDI) norms has made the sector one of the fastest growing and the top five employment opportunity generator in the country.

As the world has entered the era of modern technological advancements in the Telecom Sector such as 5G, IoT, M2M etc., a need was being felt to introduce a 'customer focused' and 'application driven' policy for the Indian Telecom Sector, which can form the main pillar of Digital India by addressing emerging opportunities for expanding not only the availability of telecom services but also telecom-based services. The National Digital Communication Policy 2018 was one of the key initiatives of DoT, MoC to cater to the modern technological advancements in the Telecom Sector.

Recently, India through TEC has adopted OneM2M specifications as the national standards for IoT/M2M technologies in India. Adoption of these specifications post its transposition by TSDSI, as national IoT standards is a big milestone for India and it shall provide a framework to support applications and services such as smart city, smart grid, connected car, home automation, public safety, health and many more.

India is also gearing up for 5G Rollouts, which is expected to begin in early-2022 after conclusion of spectrum auction. A high-level forum to evaluate and approve roadmaps and action plans to bring 5G in the country was constituted by DoT comprising of members from academia, industry stakeholders and secretaries of ministries of telecom, IT, and science and technology and set aside a corpus of Rs 500 crore (€59 million) for R&D activities. 5G Test bed trials commenced in 2018, spearheaded by Ericsson with Indian Institute of Technology, Delhi (IIT Delhi) to work on India specific usage scenarios and applications. Telecom Regulatory (TRAI) also released a white paper on “Enabling 5G in India”, highlighting the specifications of the 5G technology, discusses the potential use cases and architecture of 5G networks.

DoT and NITI Aayog are also working on the topic of Artificial Intelligence (AI). In June 2018, NITI Aayog unveiled its [discussion paper on national strategy on AI](#) which identified five sectors — **healthcare, agriculture, education, smart cities and infrastructure and transportation** — to focus its efforts towards implementation of AI. The paper also focuses on how India can leverage the transformative technologies to ensure social and inclusive growth. DoT’s AI Standardisation Committee has also released its Indian AI Stack discussion paper, with the intention of mitigating impediments in AI deployment and essentially make AI uniform for application across sectors. DoT has set up various working group to address the AI implementation in the country.

The National Auto Policy as announced by Department of Heavy Industry (DHI), Ministry of Heavy Industries & Public Enterprises (MoHI&PE), seeks to promote clean and safe mobility and adopt a long-term roadmap to harmonize emission standards with global benchmarks by 2028. The policy also envisages propelling India’s automotive industry amongst the top three nations in the world in engineering, manufacturing and export of automotive vehicles and components. The automobile industry in India is the world’s fourth largest. India was the world’s fourth largest manufacturer of cars and seventh largest manufacturer of commercial vehicles in 2019. India is targeting to displace Japan as the third largest auto market by 2021. The Government of India encourages foreign investment (FDI) in the automobile sector and has allowed 100% FDI under the automatic route.

India's electric vehicle (EV) market is estimated to be a Rs. 50,000 crore (€5.88 billion) opportunity by 2025, with two- and three-wheelers expected to drive higher electrification of the vehicles. The government of India has started addressing the ecosystem of electric vehicles (EVs) and the country's infrastructure to support them. The guidelines & standards for charging infrastructure for electric vehicle were issued by the Ministry of Power (MoP) in December 2018 and were revised in October 2019. The government aims to have at least one charging station to be available in every 3 sq. km grid in cities; and one charging station every 25km grid on both sides of intra-city highways.

Government of India through its Ministry of Railways (MoR) has announced its National Rail Plan. The National Rail Plan will be a common platform for all future infrastructural, business, and financial planning of the Railways. This plan is being circulated among

various Ministries for their views now and Ministry of Railways aims to finalise the Final plan in early 2021.

The Government of India has identified electrical sector as a key sector of focus to promote sustained industrial growth. India's electrical sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional. India was ranked fourth in wind power, fifth in solar power and fifth in renewable power installed capacity as of 2018. India also ranked sixth in the list of countries to make significant investments in clean energy at US\$ 90 billion. Apart from the Smart Grid Mission, Government has also initiated the Smart Meter National Programme (SMNP) to eventually replace 25 crore (250 million) conventional meters with smart meters across India. These smart meters are installed as per guidelines issued by the Central Electricity Authority.

Details of the new initiatives and policies introduced are provided in this report.

A complete section (chapter 5) is devoted to the important stakeholders and players covering Ministries, Governmental Bodies, and Industry Associations etc. in each of the project priority sector.

Report also captures information around foreign Standards Development Organizations (SDOs).

4. Main Indian Standardization Bodies

In India, there are three main standardization bodies which have been developing Indian standards and are concerning the Project priority sector of ICT, Automotive, Electrical Equipment including Consumer Electronics and Smart Cities.

- **Bureau of Indian Standards (BIS)**
- **Telecom Engineering Centre (TEC)**
- **Telecommunications Standards Development Society of India (TSDSI)**

3.1 Bureau of Indian Standards (BIS)

3.1.1 Overview

The Ministry of Consumer Affairs, Food and Public Distribution are a Union / Central government ministry of India, playing a pivotal role in the standardization. The Ministry is headed by a minister of Cabinet rank. The Ministry of Consumer Affairs of India, Food and Public Distribution are divided into two parts:

- Department of Food and Public Distribution
- Department of Consumer Affairs.

The Department of Consumer affairs administers the policies for Consumer Cooperatives, Monitoring Prices, availability of essential commodities, Consumer Movement in the country and Controlling of statutory bodies like **Bureau of Indian Standards (BIS)** and Weights and Measures.

BIS, the National Standards Body has been successfully promoting and nurturing standards movement within the country since 1947. BIS became functional as a statutory body under the Bureau of Indian Standards Act, 1986 which into effect on 23 December 1986. It took over the functions of the erstwhile Indian Standards Institution (ISI) with an enlarged scope and enhanced powers for harmonious development of activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto.

A new [Bureau of Indian standards \(BIS\) Act 2016](#) which was notified on 22nd March 2016, has been brought into force with effect from 12th October, 2017. The Act establishes the Bureau of Indian Standards (BIS) as the National Standards Body of India.

BIS does not make technical regulations however there are technical regulations issued by various Ministries which demand compliance to various BIS standards as mandatory. Technical regulations are issued by various departments under different ministries of Government of India or by different empowered regulators.

For more information, please [click here](#)

3.1.2 Technical activities

Keeping in view, the interest of consumers as well as the industry, BIS is involved in various technical activities as given below:

1. Standards Formulation
2. System Certification Scheme
3. Product Certification Scheme
4. Compulsory Registration Scheme
5. Foreign Manufacturers Certification Scheme
6. Hall Marking Scheme
7. Laboratory Recognition Scheme
8. Sale of Indian Standards
9. Consumer Affairs Activities
10. Promotional Activities
11. Training Services, National & International level
12. Information Services

1. Standards Formulation

The BIS standardization process for the development of Indian Standards (IS) follows the ISO/IEC standards and WTO/TBT guidelines. BIS's role is to coordinate inputs from various public sector stakeholders to its technical committees which are then commented by the private sector representatives (experts and industry association representatives). Since 1968 BIS has been organizing training programme on standardization for nominees of developing countries every year in the month of October.

BIS is engaged in formulation of Indian Standards for the following sectors:

- Production & General Engineering
- Chemicals

- Civil Engineering
- Electronics and Information Technology
- Electro-technical
- Food and Agriculture
- Mechanical Engineering
- Management and Systems
- Medical Equipment and Hospital Planning
- Metallurgical Engineering
- Petroleum Coal and Related Products
- Transport Engineering
- Textile
- Water Resources
- Services

Each of these sectors has a Technical department/Division Council to oversee and supervise its work as detailed below.

- i. **Electronics and Information Technology Division Council (LITDC):** Standardization in the field of electronics and telecommunications including Information Technology. Within LITDC, 35 Technical Committees have so far developed over 1750 Indian Standards. For more information please [click here](#)
- ii. **Electro-technical Division Council (ETDC):** Standardization in the field of electrical power generation, transmission, distribution, and utilization equipment; and insulating materials, winding wires, measuring and process control instruments and primary and secondary batteries. Within ETDC, 45 Technical Committees have so far developed over 1750 Indian Standards. For more information please [click here](#)
- iii. **Transport Engineering Division Council (TEDC):** Standardization in the field of transport engineering including air, water, road, and rail transport; diesel engines for stationery application and ISO freight containers, transport packaging etc. Within TEDC, 19 Technical Committees have so far developed over 1100 Indian Standards. For more information please [click here](#)
- iv. **Production and General Engineering Division Council (PGD):** Standardization in the field of basic and production engineering such as engineering drawings, screw threads, fasteners, transmission devices, weights and measures, engineering metrology, bearings, gears, horology, machine tools, hand tools, cutting tools, pneumatic tools and fluid power system including automation in manufacturing and robotics. Within PGEDC, 28 Technical Committees have so far developed over 2400 Indian Standards. For more information please [click here](#)
- v. **Civil Engineering Division Council (CEDC):** Standardization in field of civil engineering including structural engineering, building materials and components; planning, design, construction, and maintenance of civil engineering structures; construction practices; safety in building but excluding those subjects which are specifically related to river valley projects. Within CEDC, 37 Technical Committees have so far developed over 1800 Indian Standards. For more information, please [click here](#)
- vi. **Chemical Division Council (CHDC):** Standardization in the field of chemicals and chemical products including paints and related products, glass and ceramic wares, paper and stationery items, leather and footwear, soaps and detergents,

photographic and electroplating materials, lac and lac products, thermal insulation materials, industrial gases, explosives and pyrotechnics, nuclear material, chemical hazards, water quality, environmental protection and industrial safety (to the extent of their aspects relating to activity of the chemical division). Within CHDC, 26 Technical Committees have so far developed over 1800 Indian Standards. For more information please [click here](#)

- vii. **Food and Agricultural Division Council (FADC):** Standardization in the field of food, feed and agriculture produce covering food and feed chain from primary production to consumption. This also includes soil management, agricultural inputs agricultural machinery, farm management, animal keeping and husbandry, fisheries and aquaculture, food processing, food and feed safety management, biotechnology for food and agriculture, drinking water and Ayurveda. Within FADC, 29 Technical Committees have so far developed over 2000 Indian Standards. For more information please [click here](#)
- viii. **Mechanical Engineering Division Council (MEDC):** Standardization in the field of Mechanical Engineering covering Boilers and Pressure Vessels; Refrigeration and Air-conditioning; Renewable Energy Sources; Material handling Systems and Equipments; Chemical Engineering Plants and Equipments; Construction Plant and Machinery; Pumps and Hand pumps; Compressors and Blowers; Gas Cylinders; Security Equipments; Mining Equipments; Printing Machinery; Sewing Machines; Water Well Drilling; Photographic Equipments; Utensils, Cutlery and domestic hardware; oil and gas burning appliances; wire ropes and wire products; Gaskets and packing; Methods and Equipments for underground gasification and coal bed methane; Mechanical Equipments for Petroleum, Petro-chemical and Natural Gas Industries, Energy Management and Energy Saving and Manufacturing Machinery & their Safety . Within MEDC, 29 Technical Committees have so far developed over 1300 Indian Standards. For more information please [click here](#)
- ix. **Management and Systems Division Council (MSDC):** Standardization in the field of quality management systems, statistical quality control, management and productivity, documentation and information, publication and graphic technology, resource management including assets, human resource and facilities management, various services including banking and financial services, social responsibility, education, tourism and related services, psychological assessment, brand valuation, rating services, product recall, consumer product safety, sustainability in event management, competence standards, and conformity assessment. Within MSDC, 15 Technical Committees have so far developed over 400 Indian Standards. For more information please [click here](#)
- x. **Metallurgical Engineering Division Council (MTDC):** Standardization in the field of metallurgy and metallurgical engineering including ferrous and non-ferrous metals, alloys and their products, ores and minerals, foundry, refractories, powder metallurgy, heat treatment, corrosion protection, metallic coating (excluding paints, pigments and enamelling), and welding (excluding electrical welding equipment) and Nanomaterials & Technologies. Within MTDC, 21 Technical Committees have so far developed over 1650 Indian Standards. For more information please [click here](#)
- xi. **Petroleum, Coal and related Products Division Council (PCDC):** Standardization in the field of petroleum, lubricants, biofuels, solid mineral fuels, gaseous fuels, bitumen, coal tar, organic chemicals, dye-intermediates, plastics (including

adhesives, composites and safety of toys), rubber, cosmetics, fragrance & flavour ingredients and sports goods. Within PCDC, 17 Technical Committees have so far developed over 1450 Indian Standards. For more information please [click here](#)

- xii. **Textile Division Council (TXDC):** Standardization in the field of textiles covering natural and man-made fibres and their products, dyestuffs, textile speciality chemicals, textile machinery and technical textiles. Within TXDC, 27 Technical Committees have so far developed over 1350 Indian Standards. For more information please [click here](#)
- xiii. **Water Resources Division Council (WRDC):** Standardization in the field of water resources development and management; to include activities covering utilization of water resources for all uses. Regarding drinking and industrial water supply, the work shall be confined to making the raw water available for treatment and distribution. However, special publication for water management shall include all facets of technology and engineering covering entire hydrologic cycle. Regarding water for hydroelectric uses, the work shall include planning and design of hydroelectric development and powerhouse structures but may not include generation, transmission and distribution equipment. Within WRDC, 19 Technical Committees have so far developed around 450 Indian Standards. For more information please [click here](#)
- xiv. **Medical Equipment and Hospital Planning Division Council (MHDC):** Standardization in the field of Medical Equipment, Surgical dressing, Artificial Limbs, Rehabilitation Equipment, Diagnostic Kits, Veterinary Surgery Instruments, Dental Equipment, Laboratory Instruments and Equipment, Hospital Bio-medical Waste Management and Infection Control, Medical Biotechnology and Medical Nanotechnology, Hospital Planning and Health care Services. Within MHDC, 20 Technical Committees have so far developed over 1350 Indian Standards. For more information please [click here](#)
- xv. **Service Sector Department-I (SSD-I):** SSD-I is responsible for formulating Standards on service sector including Banking and Financial Services; Education Services; Tourism Services; Accounting Services. Within SSD-I, 11 Technical Committee have so far developed 57 Indian Standards. For more information, please [click here](#)
- xvi. **Service Sector Department-II (SSD-II):** SSD-II is responsible for developing Standards on service sector including Legal Services; Media & Entertainment Services; Health & Wellness Services; IT & ITES Services; Environment Services; Telecommunication Services; Infra & Construction Services; Transport & Logistics Services; Management & Systems. Within SSD-II, there are 9 Technical Committee and one Indian Standards have so far been developed. For more information please [click here](#)

BIS has so far formulated around 21,000 standards in various technology areas, out of which almost 50% are product standards and the rest are support standards such as test methods, terminology, codes of practices etc.

The changing scenario of globalization has necessitated the formulation and implementation of new standards, interaction with the industrial houses and service operators and generation of awareness amongst the consumers.

2. Product Certification Scheme

BIS through BIS Act, 2016 operates a product certification scheme for standardization of goods that enter the market for sale to consumers. Under the product certification scheme – I, BIS grants licence to use the standard mark or grants certificate of conformity as per conformity assessment schemes given in [BIS \(Conformity Assessment\) Regulations, 2018](#) . The conformity assessment schemes are laid down in BIS (Conformity Assessment) Regulations, 2018 which are based on principles laid down in IS/ISO/IEC 17067: 2013.

The Product Certification Scheme aims at providing Third Party assurance of quality, safety, and reliability of products to the customer. Presence of BIS certification mark, known as Standard Mark, on a product is an assurance of conformity to the specifications. The manufacturer is permitted to self-certify the licenced products after ascertaining its conformity to the standard. Though its surveillance operations, the Bureau maintains a close vigil on the quality of certified goods. The conformity is ensured by regular surveillance of the licensee's performance by surprise inspections and testing of samples, drawn both from the market/factory.

Although, the scheme itself is voluntary in nature, the Government of India, on considerations of public health and safety, security, infrastructure requirements and mass consumption has enforced compulsory certification on various products through Orders issued from time to time under various Acts.

To ensure enhanced consumer safety & compliance to statutory provisions, some products like gas cylinders, regulators and valves, BIS certification scheme requires each lot or batch to be inspected by BIS certification officers before release of the product.

There are three types of product certification scheme:

1. Domestic Manufacturers Certification Scheme
 - i. Normal Procedure
 - ii. Simplified Procedure
2. Foreign Manufacturers Certification Scheme
3. ECO Mark Scheme

Domestic Manufacturers Certification Scheme

The applicant may choose one of the two options available for grant of licence:

Option 1: The applicant is required to submit the filled in application along with required documents and requisite fee to the Branch Office under whose jurisdiction the manufacturing unit is located. Subsequently, after recording of the application, a preliminary factory evaluation is carried out by BIS officer to ascertain the capability of the applicant/manufacturer to produce goods according to the relevant Indian Standard and to verify the availability of complete testing facility and competent technical personnel. Samples are tested in the factory and drawn for independent testing. Grant of license is considered by BIS provided the samples pass during independent testing, preliminary evaluation is satisfactory, and the applicant agrees to operate the defined Scheme of Testing & Inspection and pay the prescribed marking fee. By this procedure, the license is expected to be granted within 4 months of recording of application by BIS and 6 months in case of all India first license for a product.

Option 2: In this procedure, the applicant is required to submit test report(s) from specified laboratories along with the application. Grant of license is considered provided

the verification visit is found to be satisfactory and the applicant agrees to implement the defined scheme of testing and inspection and pay the prescribed marking fee. Sample(s) is (are) drawn during the verification visit for independent testing, but the conformity of this sample does not form a pre-condition for grant of license. However, the test result is used for review purpose.

Guideline for grant of license is available [here](#). [Click here](#) to refer BIS Act 2016, BIS Rules 2018, BIS (Conformity Assessment) Regulations 2018 and various guidelines framed there under.

Foreign Manufacturers Certification Scheme

Bureau of Indian Standards (BIS) has been operating a Foreign Manufacturers Certification Scheme (FMCS) since the year 2000 under [BIS Act, 2016 and Rules & Regulations](#) framed there under.

Under FMCS, license is granted to a Foreign Manufacturer for use of Standard Mark on a product that conforms to an Indian Standard. The standards may be under mandatory or voluntary certification.

The Scheme is applicable for grant of licence for all [products](#) except [Electronics & IT Goods notified by MeitY](#).

The license is granted by Foreign Manufacturers Certification Department (FMCD) located at BIS Headquarters, New Delhi. The BIS license is granted for a location where the product is manufactured and tested as per relevant Indian Standard(s) and Standard Mark is applied on the product conforming to such Indian Standard(s). [Click here](#) to read more about FMCS.

NOTE: BIS is operating a separate Compulsory Registration Scheme (CRS) for Electronics & IT Goods for the product categories notified by Meity. [Click here](#) to read more about CRS. [Click here](#) for list of product categories under CRS.

ECO Mark Scheme

Besides the normal product certification scheme, BIS also grants licenses to environment friendly products under a special scheme and awards the ECO MARK to such products. These products should conform to additional requirements specified in the Indian Standards to qualify. The procedure for grant of license is same as that of Domestic Manufacturers.

The Government of India has instituted this scheme for labelling of environment friendly products to be known as ECO Mark. The scheme is being administered by the Bureau of Indian Standards. So far the following product categories have been identified for coverage under this scheme:

- a) Soaps and Detergents;
- b) Paints;
- c) Paper;
- d) Plastics;
- e) Cosmetics;
- f) Textiles;

- g) Batteries;
- h) Wood Substitutes;
- j) Propellants and Aerosols;
- k) Food Items (edible oils - including Vanaspati, Tea and Coffee);
- m) Electrical and Electronics Goods;
- n) Packing/Packaging Materials;
- p) Lubricating/Speciality Oils;
- q) Drugs;
- r) Foods Preservatives and Additives; and
- s) Pesticides.
- t) Leather

The Scheme is being operated on a national basis and provides certification and labelling for household and other consumer products which meet certain environmental criteria along with quality requirements prescribed in relevant Indian Standards for the product. For the implementation of the scheme, BIS is responsible for the following functions:

- I. Assessment of the product for ECO Mark, certification of the product for award of ECO Mark.
- II. Renewal, suspension, and cancellation of the licence.
- III. Products certified as eligible for the ECO Mark shall also carry the ISI Mark (except for leather) for quality, safety and performance of the product and shall be licensed to carry the ECO Mark for a prescribed period after which it shall be reassessed.
- IV. Undertaking inspections and taking samples for analysis of any material or sub-stance in relation to which the BIS - ECO Mark has been used as may be necessary for proper implementation of ECO Mark. For this purpose, the Standard Mark of Bureau would be a single mark having a combination of the ISI Mark and the ECO Logo which is illustrated below:

BIS STANDARD MARK & ECO LOGO



To operate the scheme, BIS has included additional requirements for ECO Mark in the concerned Indian Standards. The terms and conditions governing operation of the licenses including fees shall be as per the Bureau of Indian Standards Act, Rules and Regulations framed thereunder. Marking fee would be separate - one with and the other without ECO Mark requirements. Similarly, two types of schemes of testing and inspection have been prepared, one incorporating the additional requirements of the ECO Mark and the other for BIS Certification against Indian Standards. For more information please [click here](#) and the list of products under compulsory certification scheme-I (ISI mark scheme) is available [here](#)

3. Compulsory Registration Scheme

Ministry of Electronics and Information and Technology (MEITY) along with Bureau of Indian Standards (BIS) introduced Compulsory Registration Scheme (CRS) in 2012 with the

objective to curb sale of spurious imported products in the country. Under this scheme it is mandatory for manufacturers to get their products registered before launching them in market. Since then, Government of India has notified over 60 electronic products that require mandatory registration under the Bureau of Indian Standards (BIS) before sale in the country.

- MEITY notified "[Electronics and Information Technology Goods \(Requirement for Compulsory Registration\) Order, 2012](#)" in 2012 for 15 categories of electronics items.
- [Another 15 product categories](#), [13 product categories](#), [12 electronic products](#) were added by MEITY in 2014, 2017 & 2020 respectively.
- Ministry of New and Renewable Energy (MNRE) has also notified Solar Photovoltaics, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017 for 6 products through [notification dated 05 September 2017](#).
- MeitY has also notified Indian Standard for 'Indian Language Support for Mobile Phones' on 24 October 2016.

As per the Order, no person shall manufacture or store for sale, import, sell or distribute goods which do not conform to the Indian standard specified in the order. Manufacturers of these products are required to apply for registration from BIS after getting their product tested from BIS recognized labs.

BIS then registers the manufacturers under its registration scheme who are permitted to declare that their articles conform to the Indian Standard (s). The registered manufacturers are then allowed to use the words "Self-declaration - Conforming to IS ... (corresponding Indian Standard number) along with R-XXXXXXX (Registration number) and/or put the Standard Mark notified by the Bureau.

BIS is operating Compulsory Registration Scheme (CRS) as per [Scheme - II of Schedule - II of BIS \(Conformity Assessment\) Regulations, 2018](#). [Click here](#) to refer BIS Act 2016, BIS Rules 2018, BIS (Conformity Assessment) Regulations 2018 and various guidelines framed there under.

Overseas Manufacturers are required to have a local representative in India who will represent the manufacturer locally and will be responsible for placing the product in the market. To make this program robust, [Market Surveillance](#) has been designed to ensure compliance.

[Click here](#) to read more about CRS.

4. *BIS WTO-TBT Enquiry Point*

The Government of India, Ministry of Commerce has designated BIS as the WTO-TBT Enquiry Point under the Agreement on Technical Barriers to Trade (TBT) of the World Trade Organization (WTO) to answer all reasonable inquiries from other members and interested parties concerning standards, technical regulations, and conformity assessment procedures.

For more details about the WTO-TBT Enquiry Point and to see WTO-TBT Notifications please [click here](#)

3.1.3

International collaboration

International Cooperation and Agreements

BIS as the National Standards Body of India has been participating in International Standardization activities and projecting India's interest during various stages of the development of International Standards. BIS is a member of ISO and through the Indian National Committee (INC) is a member of IEC. BIS is also a member of regional standards bodies like Pacific Area Standards Congress (PASC) and South Asian Regional Standards Organization (SARSO).

To facilitate acceptance of Indian products in the International Market, BIS has been to extent possible harmonizing its standards with ISO/IEC standards by adopting these standards as Indian Standards as shown in table 1.

Table: 1

Harmonization of Indian Standards							
S.NO.	Degree of Equivalence	ISO	IEC	ISO/IEC	IEEE	Others	Total
1	Identical under dual numbering	2601	830	118	2	271	4169
2	Identical under single numbering	550	258	178	0	289	1572
3	Modified/Technically Equivalent	120	406	1	2	111	897
4	Not Equivalent	290	0	1	0	49	888
5	Indigenous	145	132	1	0	149	10584
	Total	3706	1626	299	4	869	18110
6	Unclassified Indian Standards						745
7	Total Indian Standards Published						20933

Source: https://www.services.bis.gov.in:8071/php/BIS/PublishStandards/Deg_report/

BIS has also entered into MoUs with NSBs of many countries.

BIS and ISO:

BIS has been an active member of ISO and has been contributing in policy as well as technical matters related to International standardization.

At the policy level, India:

- periodically served as a member of the ISO Council and is currently its member for the term 2017-19 and represented in Council Standing Committees on Finance and Council Standing Committee on Oversight

- Periodically served as a member of the ISO Technical Management Board (TMB).
- Participating member of its Policy Development Committees on Developing Country Matters (DEVCO), Committee on Conformity Assessment (CASCO), and Committee on Consumer Policy (COPOLCO).
- Holds the Convenorship of the DEVCO Working Group on 'Resources to enhance NSB capabilities in standards development and use.

At present India is a Participating (P) member of 449 committees and Observer (O) member in 212 committees. India participates in the ISO technical committees through corresponding National Mirror Committees of BIS. Participation in ISO work is through participation of delegation of experts where important in the committee meetings, by commenting on documents and by voting on documents through electronic voting system. Indian experts are participating in work of over 400 different working groups of ISO TCs. India also holds the Secretariat of 10 ISO committees and Convenorship of 19 ISO working groups.

The committees for which BIS holds the Secretariat are as follows:

- ISO/IEC JTC 1/SC 7 IT – Software and systems engineering.
- ISO/TC 34/SC 7 Food products- Spices & Condiment
- ISO/TC 113 Hydrometry
- ISO/TC 113/SC 1 Velocity area methods.
- ISO/TC 113/SC 6 Sediment transport
- ISO/TC 120 Leather
- ISO/TC 120/SC 1 Raw hides and skins, including pickled pelts.
- ISO/TC120/SC2 Tanned leather
- ISO/TC 120/SC 3 Leather products
- ISO/TC 146/SC 1 Air Quality – Stationery source emissions

BIS and IEC:

India started taking part in IEC from 1911. BIS took over the responsibility of Indian National Committee of IEC (INC-IEC) in 1949 from Institution of Engineers. Since, then the INC-IEC is actively participating in the activities of the IEC both at the policy level and technical work and carrying out the responsibilities as member body of IEC Council.

- India is a member in Standards Management Board (SMB) of IEC since 2015 and has been elected for the second term 2018-2020.
- India has participating member status in 92 Technical Committees and observer member status in 74 Technical Committees of IEC. India holds the convenorship on 6 IEC committees. Participation in IEC work is done through participation of delegation of experts in the committee meetings, by commenting on documents and by voting on documents through electronic voting system.
- India holds the Chairmanship of the IEC Systems Committee on 'Low Voltage Direct Current (LVDC) and LVDC for electricity access' and of IEC/TC 33 'Power capacitors and their applications'.

Bilateral Co-operations:

BIS is also actively involved in bilateral cooperation with National Standards Bodies of other countries including Japan, Afghanistan, Bangladesh, Bhutan, Egypt, Ghana, Greece, Indonesia, Iran, Jordan, Kyrgyzstan, Kenya, Saudi Arabia, Mali, Mauritius, Nigeria, Russia,

UAE, Uzbekistan, Viet Nam etc. and with other Standards Developing Organizations for co-operation in areas of standardization, testing, certification, training etc. BIS has signed 30+ Memorandum of Understanding (MoU) in the fields of standardization and conformity assessment and is in the process of having such arrangements with several other countries. In addition, BIS has also signed Bilateral Cooperation Agreements (BCA)/Mutual Recognition Agreements (MRA) with the National Standards Bodies of several countries including Pakistan, Sri Lanka, Brazil, Israel etc.

BIS also plays an active role in formulation and implementation of regional standards and on conformity assessment scheme for the SAARC countries under the South Asian Regional Standards Organization (SARSO).

List of important MoUs and BCAs/MRAs signed with countries/organizations:

S. No.	Country	Organization	Total of MoU/Bilateral Cooperation	Document
1	-----	ISO	Memorandum of Understanding (MoU) the Bureau of Indian Standards (BIS) – National Institute of Training for Standardization (NITS) and the International Organization for Standardization (ISO)	View
2	European Union	CEN	MoU for national adoption of CEN Standard EN 115:1995 + A1:1998 + A2:2004 “Safety rules for the construction and installation of escalators and passenger conveyers” in India	View
3	Germany	DIN	Memorandum of Understanding (MoU) between Bureau of Indian Standards, New Delhi represented by the Director General Mr. Svayam Prakash Sharma and DIN Deutsches Institut für Normung, Berlin represented by Director Dr-Ing. Torsten Bahke on cooperation and mutual interest in the fields of standardization and certification	View
4	Germany	DKE	Memorandum of Understanding between Bureau of Indian Standards, New Delhi and DKE German Commission for Electrical, Electronic and Information Technologies of DIN and VDE, Frankfurt am Main	View
5	USA	BIS, ANSI & CII	MoU to establish an India - U.S. Standards Portal between BIS, CII and the American National Standards Institute (ANSI)	View
6	USA	American National Standards Institute (ANSI)	MoU between BIS and the American National Standards Institute	View

7	USA	The Institute of Electrical and Electronics Engineers (IEEE)	MoU between BIS, India and the Institute of Electrical and Electronics Engineers, Incorporated, USA (IEEE) on cooperation in standardization	View
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BIS also participate and follow India-Brazil-South Africa (IBSA) Dialogue Forum.
<http://www.ibsa-trilateral.org/>

Complete list of MoUs and BCAs/MRAs signed by India with countries/organizations is available [here](#)

3.2 Telecommunication Standards Development Society, India (TSDSI)

3.2.1 Overview

The Indian Telecom Industry, comprising operators and manufacturers, Academia and R&D organizations came together to form Telecommunications Standards Development Society, India (TSDSI) on 7 January 2014, with an objective to contribute to next generation telecom standards and drive the eco-system of IP creation in India.

TSDSI has been constituted as an autonomous ‘not for profit’ Standards Development Organization for Telecom products and services in India. It is registered as a society under the Societies Registration Act XXI, 1860 and is recognized by the Department of Telecommunications, Govt. of India as India’s Telecom SDO. It is a membership-based organization.

[TSDSI’s members](#) include telecom operators and VAS providers, manufacturers, R&D organizations/Test Labs, academia, industry associations, PSUs, and government department.

TSDSI develops standards for access, back-haul, and infrastructure systems, solutions and services that best meet India specific Telecom/ICT needs, based on research and innovation in India. It also works closely with global standards’ bodies to reflect Indian requirements into International telecom/ICT standards.

TSDSI plays an important role in encouraging generation of Indian IPRs in this technology intensive field and get them incorporated into International standards. This in turn promotes indigenous research, product development and manufacturing. Department of Telecommunications & Ministry of Electronics and Information Technology, Govt. of India are jointly supporting TSDSI as India’s Telecom/ICT SDO.

Objectives of TSDSI are:

- Developing, promoting, and standardizing India-specific Telecom/ICT requirements and solutions
- Taking Indian requirements to global standards organizations
- Helping create standards-based manufacturing expertise in the country
- Providing guidance and leadership to developing countries

For more information, please [click here](#)

3.2.2 Technical activities

Technical activities of TSDSI are conducted in two Study groups, namely, Study Group-Networks and Study Group-Services & Solution.

- I. **Study Group (SG)-Networks:** SG-Networks is responsible for standardization activities for the following:
 - a) Wireless communication systems including Radio-based access and Mobile core networks, the functional elements constituting these networks and the interfaces between these networks.
 - b) Overall system architecture as well as the protocol interface between various user equipment or customer premises equipment and the elements in the access network e.g., base stations, relay stations, etc.
 - c) Software defined networking (SDN) aspects and Network function virtualization (NFV) of the access and core networks.
 - d) Backhaul using wireless & wireline, microwave, optical and/or packet-based transport networks and related SDN & NFV aspects, systems, equipments, optical fiber cables, along with the related control plane, network management, performance monitoring & reporting, synchronization, interfaces, multi-layer optimization techniques and testing aspects.
 - e) Spectrum studies related to the above areas, and technical recommendations.
 - f) Interference studies including co-channel, adjacent channel, and inter-system interference.

SG-Networks works closely with SG-Services & Solutions for service-level requirements.

For more information about SGN please [click here](#)

- II. **Study Group-Services & Solution: SG-Services & Solutions** is responsible for standardization activities for the following:
 - a) Definition of requirements for telecom industry and related services and applications, including:
 - Service level requirements and features for various domains and applications (e.g., IoT/M2M, Automotive, Public safety, Health).
 - b) Development of end-to-end service capabilities and architecture, based on the requirements, including:
 - Technical specifications for application layer functional elements and interfaces.
 - System aspects such as QoS, interoperability, etc.
 - Data management aspects such as schemas, analytics, provisioning, etc.
 - Localization components in services and systems e.g., Indian languages.
 - c) Security and Privacy aspects in the end-to-end telecom networks. It includes.
 - Determining the security and privacy requirements for telecom networks including the mobile cellular and fixed-line networks across user equipments, access network, transport network, core network and service layer security aspects.
 - Specifying the related security architectures and protocols.
 - d) Energy performance for telecommunication networks including access, user equipment, aggregation, core including the underlying transport systems, including:

- Setting the energy performance related requirements across the end-to-end network
- Benchmarking network energy performance
- Energy optimization for networks
- Energy performance testing
- e) Recommendations of test requirements and evaluation methodologies for any service level conformance testing activities.

SG-Services & Solutions works closely with SG-Networks for those aspects that are related to security in access network, core networks or wireless/wireline based backhaul networks.

For more information please [click here](#)

Standards formulation:

All technical activities are conducted in specific Study Groups (SGs). These groups may have dedicated work groups (WGs) to work on identified study and/or standardization items. A member organization can subscribe to any technical group (SG or its WG) and participate in its proceedings.

1. **Proposal for Standardization Candidates:** A member can bring standardization candidate into TSDSI by submitting a New Item Proposal (NIP) to the relevant Study Group. A NIP may be approved for study/analysis of a problem statement that requires technology solution; in which case it may be accepted as a Study Item leading to a Technical report. Alternately, if the opportunity for creating a standard is clearly visible, the NIP can get approved as a Work Item leading to a draft standard. All decisions are expected to be taken by “consensus”.
2. **Making of Standards:** Standard is created after conducting a detailed analysis of all prospective candidates for standardization proposed by members. It is the endeavour of members to collaborate with global forums to create globally harmonized standards. India specific requirements are taken to the appropriate global Standards forums for incorporation. Technical Standards (TSs) drafted by the technical groups are presented to the Governing Council and then to the General Body for approval and release. Contributions, approved by the members of the technical group, are incorporated in the target Technical Report/Standard document. Technical Reports (TRs) can be released by the Technical groups after taking approval from the GC.

All Study Groups and their constituent Work Group(s) have a Chair and a Vice Chair each, elected in their individual capacities by the members to moderate/conduct the activities of the group following the principles of openness, transparency, fairness, consensus, and due process.

3.2.3 International collaboration

TSDSI Alliances: TSDSI has signed cooperation agreements with the following international SDOs:

- Association of Radio Industries and Businesses (ARIB), Japan
- Alliance for Telecommunications Industry Solutions (ATIS), USA

- China Communications Standards Association (CCSA), China
- Continua Health Alliance, USA (IoT in Health)
- European Telecommunications Standards Institute (ETSI), Europe
- Telecommunications Technology Association (TTA), Korea
- Telecommunication Technology Committee (TTC), Japan

TSDSI has signed following MoUs:

- MoU with Global Certification Forum (GCF) to share information and perspectives on mobile devices testing and the requirements of the country's rapidly growing mobile phone market.
- MoU with ETSI focusing on the areas of 5G, NFV/SDN and Intelligent Transportation Systems (ITS). [Read more](#)
- MoU with 5G Infrastructure Association (5G IA) to foster collaboration on Research, Standards, Regulations and Policies. [Read more](#)
- Recently, TSDSI has also signed a [MoU](#) with TIA (Telecommunications Industry Association) to advance ICT standards with a special focus on smart buildings and wireless infrastructure. They will share technical knowledge and best practices, participate in events, facilitate discussions with standards-related forums, and work together to identify potential areas for cooperation.

TSDSI at ITU:

TSDSI is a member of ITU-T SG15 (Networks, Technologies and Infrastructures for Transport, Access, and Home).

TSDSI is working with ITU-R SG5 (Terrestrial Communications) to participate actively in IMT2020 activities.

TSDSI has successfully introduced an indigenous developed 5G candidate standard at the International Telecommunications Union (ITU) WP-5D Meeting in Geneva held during December 10-13, 2019. The TSDSI 5G technology will deliver, in addition to the ultra-fast, low-latency mobile internet and next-generation IoT services in both cellular and mm-wave spectral bands common to all 5G candidate standards, an additional technological enhancement that can provide broadband connectivity to rural users using ultra-long range cell sites. This enhancement will ensure 100% of India's villages can be covered from towers located at panchayat villages where Bharat-net reaches, whereas nearly a third of such neighbouring villages would be out of coverage otherwise. The Indian 5G submission exploits a new transmit waveform that increases cell range developed by research institutions in India and supported by some Indian companies. [Read more](#)

TSDSI at oneM2M:

oneM2M Partnership: TSDSI is Partner Type I of oneM2M, one of the leading forums driving M2M service layer standards. Approx. 53 contributions from TSDSI Member, [CDOT](#), have been agreed in one M2M, the global partnership project driving M2M service layer standards. TSDSI Member CDOT has been participating in the oneM2M TP and Interoperability events regularly. Copy of agreement is available [here](#)

- *TSDSI has transposed the full set of oneM2M Rel. 2 specifications ([17 specifications and 10 Technical Reports](#)) for a M2M common services Layer platform and has begun work on transposition of Release 3 specifications of oneM2M.*

- TSDSI has also published [Technical Reports](#) on M2M based Use Cases in key Vertical application areas.

TSDSI at 3GPP:

3GPP Membership: TSDSI is one of the 7 Organizational Partners of 3GPP. This entitles TSDSI members to become Individual Members of 3GPP through TSDSI and take their IPR into the global arena. This also enables them to contribute to the development upcoming standards such as 5G.

- TSDSI has also transposed [specifications of 3GPP](#) (select specifications from Rel. 10 to Rel. 13 for IMT Advanced Technologies (as per IMT M.2012-3).
- [TSDSI standard on IMT Advanced](#) technology, has been taken up for adoption by TEC.

Global Standards Collaboration: TSDSI is a constituent SDO of Global Standards Collaboration (GSC) – a voluntary forum of the world’s leading information and communication technologies standards organizations (SDOs). This forum meets once a year to deliberate upon strategic topics around ICT based standardization that has a global impact.

For more information on TSDSI’s a) Rules & Regulation click [here](#) b) Working Procedures click [here](#) c) IPR Policy click [here](#) d) Guidelines click [here](#) e) published standards click [here](#)

3.3 Telecommunication Engineering Centre (TEC)

3.3.1 Overview

The **Telecommunication Engineering Center (TEC)** is a technical body and a nodal agency of the [Department of Telecommunications](#), [Ministry of Communications](#), [Government of India](#) responsible for drawing up of standards, generic requirements, interface requirements, service requirements and specifications for telecom products, services and networks.

TEC functions are as below:

- It is a technical body representing the interest of Department of Telecom, Government of India.
- Specification of common standards about Telecom network equipment, services and interoperability.
- Prepare and Publish Generic Requirements (GRs), Interface Requirements (IRs).
- Issuing Interface Approvals, Certificate of Approvals, Service Approvals & Type Approvals.
- Formulation of Standards and Fundamental Technical Plans.
- Interact with multilateral agencies like APT, ETSI and ITU etc. for standardization.
- Develop expertise to imbibe the latest technologies and results of R&D.
- Provide technical support to DOT and technical advice to TRAI & TDSAT.
- Coordinate with C-DOT on the technological developments in the Telecom Sector for policy planning.
- Designated National Enquiry point for WTO –TBT (Technical Barrier to Trade) for telecom sector.

TEC has four Regional Centres called RTECs. These are [RTEC \(NR\)](#) for Northern region, [RTEC \(ER\)](#) for Eastern region, [RTEC \(WR\)](#) for Western region and [RTEC \(SR\)](#) for Southern region, located at New Delhi, Kolkata, Mumbai and Bangalore respectively. RTECs are responsible for testing and certification of products, equipment, and systems. Each of the RTEC is headed by a Dy. Director General. The coordination of activities of RTECs and issue of certificate is vested with Regional Coordination (RC) Unit at TEC New Delhi headed by a DDG.

In case of Type Approval, Interface Approval and Certificate of Approval, the applicant is required to apply to the respective Regional TEC (RTEC) within whose jurisdiction their manufacturing plant or Registered Office is located.

RTEC Functions:

- Registration of application for Certification & Approval of Telecom Products against GR/IR of TEC/ Applicant's own specifications.
- Carrying out Testing of Telecom Products against the specifications.
- Sale of GR/IR documents.

For more information, please [click here](#)

3.3.2 Technical activities

Telecom Engineering Centre (TEC) publishes several documents covering interface requirements (IR's), generic requirements (GR's), mandatory regulatory standards covering infrastructure and services. These specifications cover the functional areas of fixed line access, mobile telephony, network, next generation networks, information technology, radio transmission, switching, transmission, service application and other miscellaneous areas of telecom. These various specifications are drawn up through a process of consultation with various stakeholders like vendors, operators, and other interested parties.

Main divisions / Functional areas of TEC:

- [Access Lab](#)
- [Control Lab \(CL\)](#)
- [Customer Premises Equipments & Terminals Lab \(CPE & TL\)](#)
- [Cyber Security \(CS\)](#)
- [Fixed Access \(FA\)](#)
- [Future Networks \(FN\)](#)
- [Green Passport](#)
- [Information Technology \(IT\)](#)
- [Internet of Things \(IoT\)](#)
- [Mobile Technologies \(MT\)](#)
- [Next Generation Switching \(NGS\)](#)
- [Radio \(R\)](#)
- [Regional Coordination \(RC\)](#)
- [Smart Network](#)
- [Standardization](#)
- [Telecom Certification \(TC\)](#)
- [Telecom Lab \(TL\)](#)
- [Telecom Security \(TS\)](#)

- [Transmission \(T\)](#)

Labs in TEC:

- [IPv6 Ready Logo Test Lab](#)
- [SAR Lab](#)
- [Next Generation Network \(NGN\)](#)
- [Customer Premises Equipments & Terminals Lab \(CPE & TL\)](#)
- [Control Lab \(CL\)](#)
- [Access Lab \(AL\)](#)
- [Green Passport Lab \(GP\)](#)
- [Security Lab \(SL\)](#)

a) Procedures and Guidelines for formulation of TEC Standards / Documents

In May 2008, [Network Conformity Standards System & Procedures CSSP](#) was formulated for Standardization of process & procedures, numbering scheme, structure of TEC documents viz. Generic Requirements (GR)/Interface Requirements (IR)/Service Requirements (SR)/ Test Schedule and Test Procedure (TSTP). It also envisaged the process for formulation of documents i.e., GR/IR/SR etc. through involvement of Groups, Committees and Forums along with their modification, withdrawal, and review.

Subsequently, it was decided to convert existing TEC documents (GR/IR/SR etc.) into Standard documents and provide a new numbering scheme. This revised version of Procedures and Guidelines for Formulation of TEC Standards/Documents erstwhile CSSP after consultation with concerned TEC Divisions, also includes the formulation of Essential Requirements (ERs) with the launch of Mandatory Testing and Certification of Telecommunications Equipment (MTCTE) from August 1, 2019.

The purpose of this document is to outline the process to be followed and the procedure to be used by TEC, for formulation of:

- TEC Standards (erstwhile specifications viz. GRs/IRs/SRs/SDs)
- Test Guide (erstwhile TSTP) associated with TEC Standards.
- Essential Requirements (ERs) and
- Adoption of Standards.

The document also contains the framework for the procedure for formulation of:

- Committees
- Sub-Committees and
- Forums

These Committees/Sub-Committees/Forums are formed for development of TEC documents including revision of documents, as mentioned above.

[Read more/Download>>](#)

b) Mandatory Testing and Certification of Telecom Equipments (MTCTE)

The Department of Telecommunications, Ministry of Communications, Government of India vide Gazette Notification No. G.S.R. 1131(E) dated 5th September, 2017 has amended the Indian Telegraph Rules, 1951 (Amendment 2017) to introduce Mandatory Testing & Certification of Telecom Equipment (MTCTE).

Telecommunication Engineering Centre (TEC) is implementing MTCTE in India in phases.

In MTCTE, every telecom equipment needs to undergo mandatory testing and certification prior to sale, import for use in India. The testing is to be carried out for conformance to [Essential Requirements](#) for the equipment, by Indian Accredited [Labs designated by TEC](#) and based upon their test reports, certificate shall be issued by TEC.

For more details, please [click here>>](#)

c) Conformity Assessment

Designation and Recognition of Conformity Assessment Bodies (CAB) and Certification Bodies (CB):

TEC has been appointed as the Designating Authority (DA) for Telecom Equipment. TEC as DA will be designating Conformity Assessment Bodies (CABs)/ Certification Bodies (CBs) located in India to perform testing and certification of telecom products. The role of TEC as DA is also to recognizing Foreign CABs/ CBs located in the territory of MRA partner to perform testing and certification of telecom products to Indian requirements.

The following documents lay down the procedures and criteria for designating Conformity Assessment Bodies for testing and/or certifying to the MRA partnership requirements. The document also lays down the procedure for recognizing Foreign CABs/ CBs designated by the MRA partners to certify to Indian requirements. To qualify for designation/ recognition, the CABs/ CBs must fulfill the criteria as given in the scheme at clause no. 9.

- [Scheme for Designating Domestic Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment](#) (Issue 2- December 2017) (Amendment No.1, 18th June, 2018) (Amendment No.2, 1st November, 2018) (Amendment No.3, 18th Jul, 2019)
- [Scheme for Recognising Foreign Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment](#) (Issue 2- December 2017)

A Conformity Assessment Body (CAB)/ Certification Bodies (CBs) in India interested in certifying and/or testing of any telecom products to the requirements of a foreign country/custom territory that has entered into Mutual Recognition Agreement or Arrangement with India need to apply to TEC. Similarly, the Foreign CABs/CBs designated by the MRA partner may apply for Recognition for testing and /or certifying the Indian requirements.

At present, India has Mutual Recognition Agreement or Arrangement (MRA) with Singapore in Telecom Sector. IDA Singapore has scheme for recognition of CAB / CBs which gives details of their Telecom Specifications and Test Procedure. Details about Singapore on Telecom sector is available at [Infocomm Development Authority \(IDA\), Singapore](#).

- [List of documents required against Legal Identity & address proof](#) w.r.t. Annexure -1 of scheme.
- [UNDERTAKING](#) [To be submitted by the applicant with the CAB application]
- [UNDERTAKING](#) [Undertaking format submitted by Govt. bodies for NON NABL]
- [Click here for payment for CAB through NTRP \(online\)](#)
- [Guidelines for payment to TEC for designation of Conformity Assessment Body \(CABs\)](#)
- [List of the Domestic Designated CABs](#)
- [List of Domestic CABs whose designation withdrawn](#)

For more information, please [click here>>](#)

d) IoT/M2M reports

TEC had been assigned the task to undertake studies through stakeholders and finalize Indian specific standards/specifications and to make contributions in International Standardization effort. TEC will bring out reports with the objective of achieving interoperability among devices/ network/ applications and harmonization of Indian standards with global standards, on four sectors namely Automotive, Health, Power, Safety and Surveillance and one on M2M Gateway and Architecture.

- M2M Working Groups: To begin with, five multi stake holders Working Groups as detailed below were formed in TEC in March 2014. Working Groups are having members from TEC, DoT, Telecom Service Providers (TSPs), OEMs, R&D organizations, Vertical Industries, MNCs, IT / ITes, Semiconductor industries and standardization bodies (ETSI, TSDSI, BIS etc.).
 - i. M2M Gateway and Architecture
 - ii. Power
 - iii. Automotive
 - iv. Health
 - v. Safety and Surveillance
- Joint Working Group (JWG): It comprises members of all the working groups. Following new working groups have been created in June-2015.
 - I. Security (End to End security of M2M domain)
 - II. Smart Cities
 - III. Smart Homes
 - IV. Smart villages and Agriculture
 - V. Smart Environment (Environment monitoring and Pollution Control)
 - VI. Smart Governance
- Frame of Reference for the working Groups was prepared and approved in the JWG meeting. ([Click here](#))
- Technical Reports (Release 1 and Release 2) of M2M working groups ([Click here](#))

e) Adoption of TSDSI/International Standards

A policy document called '[Standardization Guide](#)' based on [ISO/IEC Guide 21-1](#) has been prepared by TEC outlining the adoption process and institutional mechanism for adoption of domestic/international telecom standards' after approval of Hon'ble Minister of

Communications. It has further been notified by TEC vide Office Memorandum No. [2-1/2018/SD/TSDSI/TEC/5](#) dated 8th May 2020.

The main points of the Standardization Guide are as given below:

- i. TEC will adopt the standards after wide public consultation process instead of ratification (ratification does not include public consultation)
- ii. For adoption, ISO/IEC-Guide 21 has been used as guiding document.
- iii. The standards should be adopted by TEC as National Standards. National Standards adopted shall be voluntary unless made mandatory by its use, reference, or adoption by regulation / Govt. directive.
- iv. TEC shall implement the standard adoption process with the help of institutional framework which will consist of:
 - Telecom Standards Advisory Committee (TSAC)
 - Consultative Committees (CC)
 - Task Force (TF) setup for the purpose.
 - Standardization Secretariat
- v. The adoption process will be completed in time bound manner after circulation of the draft.
- vi. IPR shall not be subject matter of adoption.
- vii. Telecom Standards Advisory Committee (TSAC) is the apex committee to be headed by DDG (S), TEC and comprising members from TEC, CDOT, TSDSI, Govt. bodies, OEMs, TSPs, Academia, R&D organizations etc. (max 11 members), with following functions:
 - To examine, evaluate and endorse standards.
 - To oversee & review the standardization program.
 - To strategize and prioritize standardization activities.
 - To advise TEC on standardization policies, strategies, and best practices
 - To collaborate with other standard formulating bodies
- viii. Consultative Committee (CC) is the Working Group (WG) constituted under TSAC consisting of the technical experts from TEC, CDOT, TSDSI, Govt. bodies, OEMs, TSPs, Academia, R&D organizations etc. (min 10 members) with Chairman from the concerned TEC division and Vice chairs from the industry/academia and the function of the CC will be to collate, review and include or reject public comments.
- ix. Standardization Secretariat under Standardization division in TEC will scrutinize the proposal for GC approval and national requirement. It will also invite the public comments; then collation it and submit for approval.

The TSDSI transposed oneM2M (Release 2) standards and 3GPP standards (402 nos.) – same as ITU R M.2012 Rev4 have been approved for adoption as national standards by TEC. Similarly, the process of adoption of TSDSI Common Public Radio Interface (CPRI) Front haul transport standards into National Standards is underway.

3.3.3 International collaboration

TEC participates & follow programmes of standardization bodies such as below directly/indirectly:

- ITU
- 3GPP

- oneM2M
- ETSI
- GSMA
- IEEE

National Working Groups:

TEC coordinates with ITU-T and having following National Working Groups (NWGs) in line with ITU-T Study Groups:

- NWG 5: Environment and climate change
- NWG 9: Television and sound transmission and integrated broadband cable networks.
- NWG 11: Signalling requirements, protocols, and test specifications.
- NWG 12: Performance, QoS and QoE
- NWG 13: Future networks including mobile and NGN.
- NWG 15: Optical transport networks and access network infrastructures
- NWG 16: Multimedia coding, systems, and applications
- NWG 17: Security

For more information, please [click here](#)

4. New Approach / Initiatives (Project Priority Sectors)

During the last few years India is adopting a new approach and initiatives towards economic and social development of the country. The new vision and approach of the Government of India is evident in the various new policy announcements and initiatives introduced by the various Ministries under the Government of India. Few of these new initiatives are briefed below in this sector of the report.

4.1 Generic

4.1.1. Bureau of Indian Standards (BIS) Bill 2016

The Parliament had passed the [Bureau of Indian Standards \(BIS\) Bill](#), replacing the 30-year old Bureau of Indian Standards Act, clearing the path to bring more products under the voluntary/mandatory standard regime. The Bill replaced 1986 act to include goods, services, and systems, with services being introduced for the first time under the Act. The Bill recognizes BIS as a National Standards body with international recognition to represent country in several multilateral & bilateral forums. One of the prominent highlights of the bill is that it gives the BIS the authority and power to withdraw sub-standard products from the market. The bureau may recall goods or articles which are already out for sale or supply. The Bill allows the central government to notify certain goods, articles, etc. which will need to compulsorily carry a standard mark - if it thinks them to be necessary for (i) public interest or for the protection of human, animal or plant health, (ii) safety of the environment, (iii) prevention of unfair trade practices, or (iv) national security.

Key takeaways of the BIS Bill:

1. **A boost for Make in India and the manufacturing sector:** With the industry battling for reviving the manufacturing sector, strengthening the services sector, the

product/service offerings must be best in class with no compromise on safety, quality and performance - these have to be cornerstones of Make in India. A focus by the manufacturers on 'basics' (safety, quality and performance) is necessary both in the short term (to get a ticket to the export market) and the long run (to enable creation of healthy, sustainable business and industry). This theme is applicable for larger industries/companies as well as the SME sector. Adopting and implementing global standards in India (whether voluntarily by the industry or mandatorily, e.g., by the industry or Government) is an essential first step to create such level playing fields.

Self-certification/declaration: Pushes the Make in India agenda.

2. **Mandatory certification of certain goods:** The Bill allows the central government to notify certain goods, articles, etc. which will need to compulsorily carry a standard mark - if it thinks them to be necessary for (i) public interest or for the protection of human, animal or plant health, (ii) safety of the environment, (iii) prevention of unfair trade practices, or (iv) national security.

The Bill for the first time introduced the concept of conformity assessment with multiple certification bodies; this will ensure easy implementation and upholding desired levels of consumer safety and product quality. The penalties for substandard product/service (holding the top management responsible, the risk of product recall, etc.) will ensure focus on quality.

The introduction of the concept of multiple third-party certification bodies can provide a means of a more cost-effective administration and oversight for the government, faster time-to-market for manufacturers' goods, and upholding desired levels of consumer safety and product quality.

3. **This is good for the consumer:** It is imperative to understand that standards and quality play an important role in consumer protection and enhancing quality of life. Whether it is technology products, automobiles or the healthcare, private players will have to be accredited with world class/Indian standards. In the medium-to-long term, expect that only quality products will make it to supermarket shelves and our homes. The products that lack the expected global/Indian standards will be recalled; the resolution of consumer grievances will be speeded up, with potential consequences for the manufacturer/service provider. This will enable a better quality of life in the 21st century India.
4. **BIS enhanced authority of Power:** One of the prominent highlights of the bill is that it gives the BIS the authority and power to withdraw sub-standard products from the market. The bureau may recall goods or articles which are already out for sale or supply. This will be done if the Bureau is convinced that the goods or articles do not conform to the requirement of a particular standard.

The Bill provides a framework for the government to look at standards, quality, and performance from all perspectives (consumer, manufacturing, make in India) and categorise products and services into mandatory, voluntary and self-declaration schemes. The Bill also enables the regulator to act together with law enforcement agencies to ensure complete program implementation, thereby providing the government with powers necessary in the interest of the consumer, environment, or the country.

Conclusion: The Government's flagship initiatives of Make in India, Digital India, Smart Cities, etc. are already catapulting the economy onto a higher growth trajectory. That given, one of the most imperative criteria for the success of these programs would be a robust regulatory and compliance framework, with time playing a key role. The BIS Bill 2016 could not have come at a better time. It is a landmark Act that would help pave the way forward for a safer India - an India where consumers step up to demand and enjoy better quality products, where the manufacturers realise the importance of quality and standards and use it as a level playing field to compete in the global market and take India towards its rightful place. The Bill creates the opportunity.

For a copy of Bill please click [here](#)

4.1.2. BIS (Conformity Assessment) Regulations, 2018

Bureau of Indian Standards (BIS) notified "BIS (Conformity Assessment) Regulations, 2018" under the BIS Act, 2016. These will be required for grant of License to use or apply a Standard Mark on any article or goods notified under the Conformity Assessment Schemes specified in Schedule-I of these Regulations, application shall be made to the Bureau, if the articles or goods conform to an Indian Standard or specified requirements. The manner, fee, terms and conditions for grant, operation, suspension, renewal, non-renewal, and cancellation of such Licenses are as specified in these Regulations.

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BIS (Conformity Assessment) Amendment Regulations, 2020:

The Bureau of Indian Standards (BIS) on February 21, 2020, notifies the Bureau of Indian Standards (Conformity Assessment) Amendment Regulations, 2020 to further amend the BIS (Conformity Assessment) Regulations, 2018.

[Read more/Download>>](#)

4.1.3. BIS Rules, 2018

Bureau of Indian Standards (BIS), vide notification no. G.S.R. 584(E) dated June 25, 2018, had notified the Bureau of Indian Standard Rules, 2018. These Rules have been notified in supersession of the Bureau of Indian Standards Rules, 1987 in so far as they relate to Chapter IV A of the said rules, and in supersession of the Bureau of Indian Standards Rules, 2017 except as respects things done or omitted to be done before such supersession.

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BIS (Amendment) Rules, 2020:

The Bureau of Indian Standards (BIS) on February 18, 2020, notifies the Bureau of Indian Standards (Amendment) Rules, 2020 to further amend the BIS Rules, 2018.

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4.1.4. Consumer Protection Act, 2019

The Consumer Protection Act, 2019, was passed by the Lok Sabha on July 30 last year and Rajya Sabha on August 6, and it had received the President's assent on August 9, 2019. The Bill replaces the Consumer Protection Act, 1986.

Key features of the Bill include:

- **Definition of consumer:** A consumer is defined as a person who buys any good or avails a service for a consideration.
- **Rights of consumers:** Six consumer rights have been defined in the Bill, including the right to: (i) be protected against marketing of goods and services which are hazardous to life and property; (ii) be informed of the quality, quantity, potency, purity, standard and price of goods or services; (iii) be assured of access to a variety of goods or services at competitive prices; and (iv) seek redressal against unfair or restrictive trade practices.
- **Central Consumer Protection Authority (CCPA):** The central government will set up a CCPA to promote, protect and enforce the rights of consumers. CCPA will carry out the following functions, including: (i) inquiring into violations of consumer rights, investigating and launching prosecution at the appropriate forum; (ii) passing orders to recall goods or withdraw services that are hazardous, reimbursement of the price paid, and discontinuation of the unfair trade practices, as defined in the Bill; (iii) issuing directions to the concerned trader/ manufacturer/ endorser/ advertiser/ publisher to either discontinue a false or misleading advertisement, or modify it; (iv) imposing penalties, and; (v) issuing safety notices to consumers against unsafe goods and services.
- **Penalties for misleading advertisement:** The CCPA may impose a penalty on a manufacturer or an endorser of up to Rs 10 lakh and imprisonment for up to two years for a false or misleading advertisement. In case of a subsequent offence, the fine may extend to Rs 50 lakh and imprisonment of up to five years.
- CCPA can also prohibit the endorser of a misleading advertisement from endorsing that product or service for a period of up to one year. For every subsequent offence, the period of prohibition may extend to three years. However, there are certain exceptions when an endorser will not be held liable for such a penalty.
- **Consumer Disputes Redressal Commission (CDRC):** CDRCs will be set up at the district, state, and national levels. A consumer can file a complaint with CDRCs in relation to: (i) unfair or restrictive trade practices; (ii) defective goods or services; (iii) overcharging or deceptive charging; and (iv) the offering of goods or services for sale which may be hazardous to life and safety.
- **Product liability:** Product liability means the liability of a product manufacturer, service provider or seller to compensate a consumer for any harm or injury caused by a defective good or deficient service. To claim compensation, a consumer must prove any one of the conditions for defect or deficiency, as given in the Bill.

The [Consumer Protection Act, 2019](#) has come into force from 20th July 2020. For more information, and other related documents, please [click here](#)

4.1.5. Standards National Action Plan (SNAP) 2019

The Bureau of Indian Standards (BIS) Act of 2016 has positioned BIS in its unique leadership position as the National Standards Body (NSB) of India. The Act has cast upon BIS humongous task of leading the 'Standards' work in India through multiple potential partners available in the quality space.

To effectively perform its responsibility as the NSB of India, BIS released a [Standards National Action Plan \(SNAP\)](#) on 29 March 2019. The plan supplements the [Indian National Strategy for Standardization](#) (INSS) which the Indian Ministry of Commerce and Industry released in June 2018.

Objectives of SNAP:

1. Identification of standardisation needs and enhancing stakeholder involvement.
2. Making standardisation processes efficient and fast.
3. Ensuring harmonious standardisation activities in the country.
4. Increased participation and involvement in international standardisation activities.
5. Increasing awareness and implementation of standards.

The plan was developed based on stakeholder consultations which identified key issues such as the need for establishing a regular feedback mechanism on standards, and constraints for participation in national and international standardisation.

The action plan has prioritized standardization issues ranging from engineering to services, Internet of Things (IOT) to Artificial Intelligence (AI) and smart cities to e-mobilities. 'Smartness', 'Sustainability' and 'Services' would be the key to future standardization.

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4.1.6. Indian National Standardization Strategy (INSS)

The Department of Commerce, Government of India has now come up with [Indian National Strategy for Standardization](#) (INSS) in June 2018. The Strategy considers the current state of development across sectors, the existing quality infrastructure, and the policy directions in relation to domestic economic developments and trade in goods and services. It is the result of a broad consensus arrived over consultations held over a four-year period from 2014 to 2017 through national and regional standards conclaves that attracted wide participation of experts and stakeholders from union and state governments, industry, regulatory bodies, national and overseas standards and conformity assessment bodies, academics, and international forums.

The INSS addresses four broad pillars of the Quality infrastructure, viz Standards development, Conformity assessment and accreditation, and Technical Regulations and SPS measures, and awareness and education. It determines the critical role for each and sets goals in each area. Each goal is supplemented by a brief description of the background conditions and recommends specific activities that need to be undertaken for its realization. It takes into account the needs and expectations of all stakeholders and accords the interests of MSMEs a high consideration.

Objectives of INSS:

- Positioning standards as a key driver of all economic activities relating to goods and services
- Developing a comprehensive ecosystem in India for standards development considering the diversity of interests and expertise available
- Using standards for providing a level playing field to domestic industries and enhancing the competitiveness of Indian goods and services in domestic and international markets
- Adopting best practices in standardization, conformity assessment and accreditation and technical regulations and creating an integrated infrastructure, roadmaps, and institutions for their effective management
- Playing an active role and taking leadership positions in apex international forums in the related areas
- Creating response mechanisms to global developments on standards, technical regulations and conformity assessment practices that impact market access of Indian goods and services.

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4.1.7. National Intellectual Property Rights (IPR) Policy

The [National Intellectual Property Rights \(IPR\) Policy 2016](#) was adopted on 12th May 2016 as a vision document to guide future development of IPRs in the country.

The **broad contours of the National IPR Policy** are as follows:

Vision: An India where creativity and innovation are stimulated by Intellectual Property for the benefit of all; an India where intellectual property promotes advancement in science and technology, arts and culture, traditional knowledge, and biodiversity resources; an India where knowledge is the main driver of development, and knowledge owned is transformed into knowledge shared.

Mission: Stimulate a dynamic, vibrant, balanced intellectual property rights system in India to:

- foster creativity and innovation and thereby, promote entrepreneurship and enhance socio-economic and cultural development, and
- focus on enhancing access to healthcare, food security and environmental protection, among other sectors of vital social, economic, and technological importance.

Objectives: The Policy lays down the following seven objectives:

- IPR Awareness:** Outreach and Promotion - To create public awareness about the economic, social, and cultural benefits of IPRs among all sections of society.
- Generation of IPRs** - To stimulate the generation of IPRs.
- Legal and Legislative Framework** - To have strong and effective .
- Administration and Management** - To modernize and strengthen service-oriented IPR administration.
- Commercialization of IPRs** - Get value for IPRs through commercialization.

- vi. **Enforcement and Adjudication** - To strengthen the enforcement and adjudicatory mechanisms for combating IPR infringements.
- vii. **Human Capital Development** - To strengthen and expand human resources, institutions and capacities for teaching, training, research, and skill building in IPRs.

These objectives are sought to be achieved through detailed action points. The action by different Ministries/ Departments shall be monitored by DIPP which shall be the nodal department to coordinate, guide and oversee implementation and future development of IPRs in India. The National Intellectual Property Rights (IPR) Policy will endeavour for a "Creative India, Innovative India.

For National IPR Policy, Please [click here](#) and for Scheme for IPR Awareness, Please [click here](#)

4.1.8. Standard Essential Patents (SEPs) and their availability on Fair, Reasonable, and Non-Discriminatory (FRAND) terms

The Department of Industrial Policy and Promotion has published a [discussion paper on standard essential patents and their availability on fair, reasonable and non-discriminatory terms](#), with the objective of inviting views and suggestions from the public at large to develop a suitable policy framework to define the obligations of Essential Patent holders and their licensees.

This paper aims to sensitize the stakeholders, concerned organization and citizens towards need and importance of regulating SEPs as well as facilitating their availability at Fair, Reasonable and Non-Discriminatory (FRAND) terms. By igniting the deliberations on this subject, the department hopes to take a step forward towards achieving the national development and technological goals by protecting private Intellectual Property Rights while securing interest of public at large.

Download the [DIPP Discussion paper on Standard Essential Patents and their availability on FRAND terms](#).

4.1.9. Mobile App 'BIS-Care' and three portals – the Standardization, Conformity Assessment and Training Portals of e-BIS for consumers

In July 2020, Ministry of Consumer Affairs, Food and Public Distribution has launched the [Bureau of Indian Standard](#) (BIS) Mobile App 'BIS-Care' and three portals namely the Standardization, Conformity Assessment and Training Portals of e-BIS for consumers.

The mobile app BIS-Care can be operated on any Android phone and consumers can check the authenticity of the ISI-marked and hallmarked products through this Application. Customers can also lodge complaints using this medium.

[Download app>>](#)

4.1.10. Indian Standards Portal

Ministry of Commerce and Industry launched the India Standards Portal. The Standards Portal is online resource to provide updated information on India's Quality infrastructure

comprising prevailing systems for standardization, technical regulations, conformity assessment and accreditation practices, and the related bodies in India. Information on this portal has been structured to facilitate easy access to information both on the web pages of the portal and through links, to the different organizations responsible for providing services in the relevant areas.

[Read more>>](#)

4.2 Information and Communication Technology (ICT)

4.2.1 National Digital Communications Policy 2018

In September 2018, Union Cabinet approved the National Digital Communications Policy-2018 (NDCP2018) to achieve the goal of digital empowerment and well-being of the people of India; and towards this end, attempts to outline a set of goals, initiatives, strategies and intended policy outcomes.

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

- I. Provisioning of Broadband for All
- II. Creating 4 Million additional jobs in the Digital Communications sector
- III. Enhancing the contribution of the Digital Communications sector to 8% of India's GDP from ~ 6% in 2017
- IV. Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017
- V. Enhancing India's contribution to Global Value Chains
- VI. Ensuring Digital Sovereignty

Missions: In pursuit of accomplishing these objectives by year 2022, the National Digital Communications Policy, 2018 envisages three Missions:

- ✓ **Connect India:** Creating Robust Digital Communications Infrastructure to promote Broadband for all as a tool for socio-economic development, while ensuring service quality and environmental sustainability.
- ✓ **Propel India:** Enabling Next Generation Technologies and Services through Investments, Innovation and IPR generation to harness the power of emerging digital technologies, including 5G, AI, IoT, Cloud and Big Data to enable provision of future ready products and services; and to catalyse the fourth industrial revolution (Industry 4.0) by promoting Investments, Innovation and IPR.
- ✓ **Secure India:** Ensuring Sovereignty, Safety and Security of Digital Communications

To secure the interests of citizens and safeguard the digital sovereignty of India with a focus on ensuring individual autonomy and choice, data ownership, privacy and security, while recognizing data as a crucial economic resource.

[Read more/Download>>](#)

4.2.2 Draft Data Centre Policy 2020

Ministry of Electronics and Information Technology (MEITY) has drafted a Data Centre policy to benefit the Data Centre park developers/Data Centre operators as well as the allied ecosystem of Data Centre sector.

Vision:

Making India a Global Data Centre hub, promote investment in the sector, propel digital economy growth, enable provisioning of trusted hosting infrastructure to fulfil the growing demand of the country and facilitate state of the art service delivery to citizens.

Mission:

- Ensure sustainable and trusted Data Centre capacity in the country to meet the enormous demand generated in one of the fastest growing economies.
- Strengthen India's position as one of the most favourable countries for Data Centres by incentivizing and facilitating establishment of state-of-the-art Data Centres.
- Encourage domestic and foreign investments in the sector.
- Promote R&D for manufacturing and development of Data Centre related products and services for domestic and global markets.
- Promote domestic manufacturing, including non-IT as well as IT components, to increase domestic value addition and reduce dependence on imported equipment for Data Centres.

Objectives:

The following are some of the key objectives to be driven through this policy:

- Drive necessary regulatory, structural, and procedural interventions for enabling ease of doing business in the sector, towards attracting investments and accelerating the existing pace of Data Centre growth in the country.
- Promote sector competitiveness through various fiscal and non-fiscal incentives.
- Promote domestic start-ups, MSMEs and other Indian IT companies and provide impetus to indigenous manufacturing of IT and non-IT equipment.
- Facilitate access to uninterrupted and cost-effective power, which forms one of the most critical aspects for operating the Data Centre.
- Measures to bring in necessary improvement in network backhaul, domestic as well as international.
- Meet the data security needs by promoting investments in trusted (safe and secure) Data Centres in India.
- Facilitate standardization in the development of Data Centres.
- Promote capacity building in the sector through association with various skilling /human resource development programs.

This policy framework shall be followed by a detailed scheme with implementation guideline document providing the particulars of various fiscal and non-fiscal incentives to be provided to the sector by the Central and State Government.

[Read more/Download>>](#)

4.2.3 The Personal Data Protection Bill, 2019

The Personal Data Protection Bill, 2019 ("**PDPB**") was introduced in Lok Sabha by the Minister of Electronics and Information Technology (MEITY), on December 11, 2019. The purpose of this Bill is to provide for protection of privacy of individuals relating to their Personal Data and to establish a Data Protection Authority of India for the said purposes and the matters concerning the personal data of an individual. The Bill proposes to supersede the Information Technology Act, 2000 (Section 43-A) deleting the provisions related to compensation payable by companies for failure to protect personal data. The PDPB inter alia, prescribes the way personal data is to be collected, processed, used, disclosed, stored and transferred.

The PDPB proposes to protect "**Personal Data**" relating to the identity, characteristics trait, attribute of a natural person and "**Sensitive Personal Data** such as financial data, health data, official identifier, sex life, sexual orientation, biometric data, genetic data, transgender status, intersex status, caste or tribe, religious or political beliefs.

- **Applicability:** The Bill governs the processing of personal data by: (i) government, (ii) companies incorporated in India, and (iii) foreign companies dealing with personal data of individuals in India. Personal data is data which pertains to characteristics, traits, or attributes of identity, which can be used to identify an individual. The Bill categorises certain personal data as sensitive personal data. This includes financial data, biometric data, caste, religious or political beliefs, or any other category of data specified by the government, in consultation with the Authority and the concerned sectoral regulator.
- **Obligations of data fiduciary:** A data fiduciary is an entity or individual who decides the means and purpose of processing personal data. Such processing will be subject to certain purpose, collection, and storage limitations. For instance, personal data can be processed only for specific, clear, and lawful purpose. Additionally, all data fiduciaries must undertake certain transparency and accountability measures such as: (i) implementing security safeguards (such as data encryption and preventing misuse of data), and (ii) instituting grievance redressal mechanisms to address complaints of individuals. They must also institute mechanisms for age verification and parental consent when processing sensitive personal data of children.
- **Rights of the individual:** The Bill sets out certain rights of the individual (or data principal). These include the right to: (i) obtain confirmation from the fiduciary on whether their personal data has been processed, (ii) seek correction of inaccurate, incomplete, or out-of-date personal data, (iii) have personal data transferred to any other data fiduciary in certain circumstances, and (iv) restrict continuing disclosure of their personal data by a fiduciary if it is no longer necessary or consent is withdrawn.
- **Grounds for processing personal data:** The Bill allows processing of data by fiduciaries only if consent is provided by the individual. However, in certain circumstances, personal data can be processed without consent. These include: (i) if required by the State for providing benefits to the individual, (ii) legal proceedings, (iii) to respond to a medical emergency.
- **Social media intermediaries:** The Bill defines these to include intermediaries which enable online interaction between users and allow for sharing of information. All such intermediaries which have users above a notified threshold, and whose actions can impact electoral democracy or public order, have certain obligations, which include providing a voluntary user verification mechanism for users in India.
- **Data Protection Authority:** The Bill sets up a Data Protection Authority which may: (i) take steps to protect interests of individuals, (ii) prevent misuse of personal data,

and (iii) ensure compliance with the Bill. It will consist of a chairperson and six members, with at least 10 years' expertise in the field of data protection and information technology. Orders of the Authority can be appealed to an Appellate Tribunal. Appeals from the Tribunal will go to the Supreme Court.

- **Transfer of data outside India:** Sensitive personal data may be transferred outside India for processing if explicitly consented to by the individual, and subject to certain additional conditions. However, such sensitive personal data should continue to be stored in India. Certain personal data notified as critical personal data by the government can only be processed in India.
- **Exemptions:** The central government can exempt any of its agencies from the provisions of the Act: (i) in interest of security of state, public order, sovereignty and integrity of India and friendly relations with foreign states, and (ii) for preventing incitement to commission of any cognisable offence (i.e. arrest without warrant) relating to the above matters. Processing of personal data is also exempted from provisions of the Bill for certain other purposes such as: (i) prevention, investigation, or prosecution of any offence, or (ii) personal, domestic, or (iii) journalistic purposes. However, such processing must be for a specific, clear and lawful purpose, with certain security safeguards.
- **Offences:** Offences under the Bill include: (i) processing or transferring personal data in violation of the Bill, punishable with a fine of Rs 15 crore or 4% of the annual turnover of the fiduciary, whichever is higher, and (ii) failure to conduct a data audit, punishable with a fine of five crore rupees or 2% of the annual turnover of the fiduciary, whichever is higher. Re-identification and processing of de-identified personal data without consent is punishable with imprisonment of up to three years, or fine, or both.
- **Sharing of non-personal data with government:** The central government may direct data fiduciaries to provide it with any: (i) non-personal data and (ii) anonymised personal data (where it is not possible to identify data principal) for better targeting of services.
- **Amendments to other laws:** The Bill amends the Information Technology Act, 2000 to delete the provisions related to compensation payable by companies for failure to protect personal data.

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[Download Data Protection Committee- Report>>](#)

4.2.4 Policy for adoption domestic/international standards by TEC

It is important that the Standards developed, or International Standards transposed by TSDSI (or any other SDO) are adopted by TEC for use in India nationally rather than simply relying on the use of these Standards themselves. In view of this, a committee was constituted in TEC to formulate the policy for ratification/adoption of TSDSI/international standards.

In this context, following points have been considered while formulating this policy and are worthy of consideration.

- The national adoption of the international standards transposed by TSDSI or developed by any other SDO clearly indicates to the Standards-using community that

the respective Standard has been reviewed and endorsed by TEC and found to be relevant to the economic efficiency or safety of the Indian community.

- It clearly indicates that the TEC has determined that the Standard adopted is used internationally by Indian trading partners and is not enshrining obsolete or little used technologies or practices.
- It enables, where appropriate, the selection of options for local usage that are provided for in some international Standards.
- It expands the portfolio of Indian Standards coverage and thus encourages those seeking standardization information to seek it from within Indian Standards.
- It provides Indian standards using community with the adopted international standard at a price that may be significantly lower than the international standard and thus encourage more use of standards for the benefit of trade and the Indian community.
- TSDSI or any other SDO in India may under its prescribed bylaws may be required to get the standard transposed/ developed by it ratified / adopted from DOT.
- It is the policy of TEC DOT to align Indian national Telecom Standards with International Standards as far as feasible.

[Click here for Policy for adoption of domestic/international standards by TEC Standardization Guide](#) and [Click here for Standardization Guide](#)

4.2.5 A National Telecom M2M Roadmap

Department of Telecommunications (DoT), Ministry of Communications and Information Technology had Published National M2M roadmap in May 2015. The roadmap covers global scenario on M2M Standards, Regulation and policies, Initiatives, Make in India: Supported through M2M Adoption and Approach & Way Forward including set of recommendation:

- To facilitate M2M communication standards including encryption, quality, security and privacy standards from Indian Perspective and to recognize such standards for India.
- To release national M2M Numbering Plan (within year 2015).
- Address M2M Quality of Service aspects.
- To address M2M specific Roaming requirements.
- To formulate M2M Service Provider (MSP) registration process.
- To issue guidelines for M2M specific KYC, SIM Transfer, International roaming etc.
- Formation of APEX body involving all concerned stake holders.
- To address M2M specific spectrum requirements.
- To define frequency bands for PLC communication for various Industry verticals
- Finalization of M2M Product Certification process and responsibility centres.
- Facilitating M2M Pilot projects.
- Measures for M2M Capacity building.
- To establish Centre of Innovation for M2M.
- To assist M2M entrepreneurs to develop and commercialize Indian products by making available requisite funding (pre-venture and venture capital), management and mentoring support etc.
- Inclusion of M2M devices in PMA Policy.
- To take up matters with relevant ministries to boost M2M products and services.
- Define procedures for energy rating of M2M devices and implementation of same.

- To evolve suitable guidelines of EMF radiation of M2M devices based on research and studies by relevant bodies.

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In June 2016, DoT released draft guidelines for M2M Service Providers Registration covering:

- **General Conditions:** As part of general conditions, registration can be granted to any companies following certain guidelines. Also, M2M service providers shall not infringe upon the jurisdiction of any authorized telecom licensee/other service provider (OSP) and they shall provide only those services for which this registration is granted to them.
- **Technical Conditions:** As part of technical conditions, M2MSP can take telecom resources only from authorized telecom licensee, should adhere to the KYC norms and traceability guidelines, and ensure QoS stipulations.
- **Security Conditions and a provision** such as: The M2MSP shall induct only those devices/equipment in the network which meet TEC/TSDSI/BIS standards, wherever specified as mandatory by the Authority from time to time and in the absence of mandatory TEC/TSDSI/BIS standard, the M2MSP may deploy those devices/equipment that is certified in compliance to meet the relevant standards set by National and International standardization bodies, such as 3GPP, BIS, TSDSI, ITU, OneM2M, IEEE, ISO, ETSI, IEC etc.

In February 2018, DoT issued 13-digit numbers for the trial of machine-to-machine (M2M) communications:

Department of Telecom (DoT) has issued 13-digit numbers to telecom operators for the trial of machine-to-machine (M2M) communications like swipe machines, smart electric metres, and car tracking devices etc. that communicate through a SIM card. However, the new plan, which is to be implemented by telecom operators by July 1, will not impact the existing mobile phone users and is only meant for M2M equipment. The 13-digit numbers have been allocated to state-run firm BSNL and private telecom operators Bharti Airtel, Reliance Jio, Idea Cellular and Vodafone for testing purposes only. According to a letter sent by the DoT to operators, the authority has approved allocation of "1 million codes for testing purpose for each LSA (licence service area)" to service providers.

The **Telecom Regulatory Authority of India** has [recommended](#) that all telecom licence holders should be allowed to provide M2M service using any spectrum. However, it has suggested that critical M2M services should be provided by those companies who have licensed spectrum. The regulator has also recommended that government to issue new category of licence for M2M services for companies interested in providing or operating services in this segment only. [Read more](#)

In May 2018, DoT released instructions in relation to SIM cards used for M2M communication services:

In May 2018, DoT issued [M2M guidelines](#) for implementing restrictive features for SIMs used only for M2M communication services (M2M SIMs) and related Know Your Customer (KYC) instructions for issuing M2M SIMs to entity/organization providing M2M communication services under bulk category and instructions for Embedded SIMs (e-SIMs). [Read more](#)

In September 2020, TEC (Telecom Engineering Centre), DoT, has approved TSDSI transposed oneM2M specification Release 2 as a national standard:

TEC has approved [oneM2M specifications transposed by TSDSI](#) as a national standard. It will enable greater collaboration between IoT solution developers which will reduce the time to bring innovation to market.

4.2.6 Internet of Things (IoT) Policy: MEITY

India, in the recent few years, has been moving towards becoming a digital economy. The digital space in India has seen a lot of transformations and Internet of Things (IoT) is a recent phenomenon. Hence the Department of Electronics and Information Technology (DeitY) (Now MEITY) has drafted India's first 'Internet of Things Policy'.

The objective of the drafted policy on Internet of things (IoT) includes:

- I. To create an IoT industry in India of USD 15 billion by 2020. This will also lead to increase in the connected devices from around 200 million to over 2.7 billion by 2020. As per Gartner Report the total revenue generated from IoT industry would USD 300 billion and the connected devices would be 27 billion by 2020 globally. It has been assumed that India would have a share of 5-6% of global IoT industry.
- II. To undertake capacity development (Human & Technology) for IoT specific skillsets for domestic and international markets.
- III. To undertake Research & development for all the assisting technologies.
- IV. To develop IoT products specific to Indian needs in the domains of agriculture, health, water quality, natural disasters, transportation, security, automobile, supply chain management, smart cities, automated metering and monitoring of utilities, waste management, Oil & Gas) etc.

India's first Internet of Things Policy comes at the most appropriate time when the country is moving towards digitalization and a policy like this will support the initiatives taken in this direction. Two major efforts taken by the Government of India which will lead to a rapid growth of IoT industry are Smart Cities project and Digital India Program.

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4.2.7 Telecom Regulatory Authority of India (TRAI) recommendation on "Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications

The Telecom Regulatory Authority of India (TRAI) issued a recommendation on "Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications".

The Authority has finalized the following recommendations on: -

- I. All existing telecom service providers can be allowed to provide Machine-to-Machine (M2M) or IoT solutions within their specified circle of operations.
- II. License holders can use existing spectrum to provide IoT services while TRAI is also considering de-licensing spectrum under the 867-868 MHz, 915-935 MHz, and 57-64 GHz bands for M2M and IoT.

- III. The regulator has also put forward recommendations on SIM roaming, Quality of Service levels, privacy, security, and other aspects of IoT/M2M.

For more information, please click [here](#)

4.2.8 5G India 2020 – DoT Initiative for commencement and deployment of 5G Technologies

The 5G technology has been conceived as a foundation for expanding the potential of the Networked Society. A digital transformation brought about through the power of connectivity is taking place in almost every industry. The landscape is expanding to include massive scale of “smart things” to be interconnected. Therefore, the way future networks will cope with massively varied demands and a business landscape will be significantly different from today. The economic benefits from the 5G technology are also quite immense. As per the OECD (Organization for Economic Cooperation and Development) Committee on Digital Economic Policy, it has been stated that 5G technologies rollout will help in Increasing GDP, Creating Employment, Digitizing the economy.

For India, 5G provides an opportunity for industry to reach out to global markets, and consumers to gain with the economies of scale. Worldwide countries have launched similar Forums and thus, India has joined the race in 5G technologies. Constitution of High-Level Forum for 5G India 2020 5G is the next technological frontier. Digital Transformation through 5G will fundamentally impact other national Mission Mode projects. 5G will provide a new dimension to the Digital India, Smart Cities & Smart Village missions. 5G has potentially large contributions to Make in India and Start-Up India missions. The objective is to position India as a globally synchronized participant in the Design, Development and Manufacturing of 5G based technology, products, and applications.

In order to steer 5G India 2020, a High-Level Forum has been constituted, with an aim to;

- a) Vision Mission and Goals for the 5G India 2020,
- b) Evaluate, approve roadmaps & action plans for 5G India 2020.

- a. [Constitution of High Level Forum for 5G India 2020](#)
- b. [Press Release on 26th September 2017](#)
- c. [Making India 5G Ready-Report of the 5G High Level Forum](#)

4.2.9 TRAI white Paper on Enabling 5G in India

To create an enabling environment for the timely rollout of 5G in India, telecom regulatory (TRAI) has released a white paper on “Enabling 5G in India”. TRAI’s white paper highlights the specifications of the 5G technology, discusses the potential use cases and architecture of 5G networks. The white paper considers those areas that will require investment for 5G deployment and covers the spectrum requirements for 5G networks. The purpose of the white paper is to identify the probable challenges, including regulatory ones, in the deployment of 5G Networks in India and to initiate a discussion with all stakeholders for finding implementable solutions.

[Read more/Download>>](#)

4.2.10 National blockchain policy draft paper titled “Blockchain — The India Strategy”.

The leading policy think tank working for the government of India, Niti Aayog, has come out with a strategy document recognising many crucial areas blockchain technology can significantly benefit the country. Known as Blockchain: The India Strategy — Towards Enabling Ease of Business, Ease of Living and Ease of Governance, the 59-page policy paper is the first of two-part papers to be published by NITI Aayog. The first discussion paper covers the basics of distributed technology, its potential framework for India, the implementation challenges, lessons from NITI Aayog’s own PoCs, its use cases, and recommendations for India’s national blockchain strategy. Here are the main takeaways from the Niti Aayog’s discussion Paper:

- **NITI Aayog: Understanding Blockchain For Government of India:** As part of the document, NITI Aayog recognised Blockchain technology by giving an explainer. It said, “new data can be added to a blockchain only with an agreement between the various nodes of the blockchain network, a mechanism known as distributed consensus. Every node of the distributed network has its own copy of blockchain’s data and checks the other nodes’ data authenticity – if one node changes its local copy, the other nodes reject it. New data is added to the new block, and once added, it is immutable. Older data can neither be deleted nor modified because a snapshot of it is captured in the blocks of data that come after it.” NITI Aayog has conducted PoCs in four areas to assess the power of distributed ledgers in providing enhanced efficiency and improved possible hurdles in execution, like Track and trace’ of drugs in the pharma drug supply chain, claim verification and approval in the disbursement of fertiliser subsidies, verification of university certificates, and transfer of land record ownership. In one of the PoCs for the fertiliser subsidy pilot undertaken by NITI Aayog, the challenge was minimising the turnaround period for reimbursement of subsidies payments and freight claims. The existing workflow was filled with inefficiencies, including multiple systems of record, limited visibility for inventory stocks and low trust in the data created for claim processes.
- **NITI Aayog: Blockchain Upskilling in India:** According to the paper, there is a dearth of blockchain developers. It said that based on the most aggressive evaluation worldwide, the number of qualified blockchain developers is not more than 10,000 in total, which NITI Aayog discussion paper identifies both as a challenge as well as an opportunity.
- **Blockchain In Healthcare:** Using blockchain technology for a unified data system, NITI Aayog had another blockchain PoC in India with different partners in the healthcare industry domain. In this context, the pilot was different from the previous pilots as the process was not completely ‘captive’ to one institution and needed large scale coordination for its successful execution.

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4.2.11 Discussion Paper on the Framework of an Indian AI stack: DoT

The Department of Telecommunication (DoT)’s AI Standardisation Committee released its Indian AI Stack discussion paper, with the intention of mitigating impediments in AI deployment and essentially make AI uniform for application across sectors.

The AI stack will secure storage environments that simplify archiving and extraction from data based on the data classification, ensure the protection of data through data federation, data minimisation, an open algorithm framework, defined data structures, interfaces and protocols, and monitoring, auditing, and logging, as well as ensuring the legitimacy of backend services.

This paper says the AI stack will comprise of five major horizontal layers and one vertical layer:

- **Infrastructure** – This would be the core layer that forms the basis of an end-to-end AI functionality, with a common data controller, private and public cloud setups, determining the manner of data collection.
- **Storage** – This layer outlines the appropriate protocols for storing different kinds of data, for more efficient usage and retrieval depending on the need.
- **Compute** – This layer facilitates an open algorithm network, with AI/ML processes including NLP, DL, and neural networks. Compute layer will also lay emphasis on data engineering, build, and deploy service architectures and provide transparent architectures to industry for them to develop their own analytics.
- **Application** – A “purpose-built” layer that enables software and other applications to be hosted and executed as a service layer, which will also support backend functions and provide frameworks for the AI engine to work smoothly.
- **Data Exchange** – Also the information exchange layer, this layer will outline the end user experience through defined structures and protocols. This layer is also responsible for ensuring ethical standards pertaining to digital technologies are followed and adhered to. Until Indian laws are formalised, GDPR laws can be applied.
- **Security** – This is the sole vertical layer that cuts across the above layers to ensure the AI services are safe and secure.

For more information, please [click here](#)

4.2.12 Discussion Paper on Artificial Intelligence (AI): NITI Aayog

In June 2018, the government think-tank, National Institution for Transforming India (NITI) Aayog have released a discussion paper on National Strategy for Artificial Intelligence (AI). Artificial Intelligence presents opportunities to complement and supplement human intelligence and enrich the way people live and work. India, being the fastest growing economy with the second largest population in the world, has a significant stake in the AI revolution. Recognising AI’s potential to transform economies and the need for India to strategize its approach, NITI Aayog was mandated to establish the National Program on AI.

In pursuance of the above, NITI Aayog has adopted a three-pronged approach – undertaking exploratory proof-of-concept AI projects in various areas, crafting a national strategy for building a vibrant AI ecosystem in India and collaborating with various experts and stakeholders.

NITI Aayog unveiled its discussion paper on national strategy on AI which aims to guide research and development in new and emerging technologies.

- This strategy document is premised on the proposition that India, given its strengths and characteristics, has the potential to position itself among leaders on the global AI map.

- NITI Aayog has identified five sectors — **healthcare, agriculture, education, smart cities and infrastructure and transportation** — to focus its efforts on implementation of AI.
- The paper focuses on how India can leverage the transformative technologies to ensure social and inclusive growth.

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4.2.13 Digital India

Digital India is a campaign launched by the Government of India on 1 July 2015 to ensure that Government services are made available to citizens electronically by improved online infrastructure and by increasing Internet connectivity or by making the country digitally empowered in the field of technology. The Ministry of Communications and IT is the nodal agency to implement the program.

The initiative includes plans to connect rural areas with high-speed internet networks. Digital India consists of three core components. They are:

1. Development of secure and stable Digital Infrastructure
2. Delivering government services digitally
3. Universal Digital Literacy

With the above vision, the Digital India program aims to provide:

- Broadband Highways
- Universal Access to Phones
- Public Internet Access Programme
- e-Governance - Reforming government through Technology
- e-Kranti - Electronic delivery of services
- Information for All
- Electronics Manufacturing - Target NET ZERO Imports
- IT for Jobs
- Early Harvest Programmes

For more information, please click [here](#)

4.2.14 Draft National E-Commerce Policy 2019

In Feb 2019, Government of India has released the draft national e-commerce policy proposing setting up a legal and technological framework for restrictions on cross-border data flow and laid out conditions for businesses regarding collection or processing of sensitive data locally and storing it abroad.

The National E-Commerce Policy addresses six broad issues of the e-commerce ecosystem viz. (i) data; (ii) infrastructure development; (iii) e-commerce marketplaces; (iv) regulatory issues; (v) stimulating domestic digital economy; and (vi) export promotion through e-commerce. It identifies critical aspects of each issue and lays out strategies to achieve the Government's vision. The identification of aspects and strategies considers needs and

expectations of all stakeholders and accords the interests of start-ups, small manufacturing, trading and service enterprises a high consideration.

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4.3 Automotive

4.3.1 Draft National Auto Policy 2018

In February 2018, The Department of Heavy Industry (DHI), Ministry of Heavy Industries & Public Enterprises (MoHI&PE) released the draft National Auto Policy (NAP).

Vision: “To provide a long-term, stable and consistent policy regime and to have a clear roadmap for the automotive industry, making India a globally competitive auto R&D and manufacturing hub and achieving the targeted objectives of green mobility”

Mission: The National Auto Policy is envisaged to achieve the following missions:

- To propel India as an automotive industry amongst the top 3 nations in the world in engineering, manufacturing and export of automotive vehicles and components.
- To scale-up exports to 35-40% of the overall output and become one of the major automotive export hubs in the world.
- To enable the automotive sector to become one of the largest employment creation engines.
- To enable the automotive sector in India to become a global hub for research & development.
- To drive the automotive sector in India to adopt safe, clean and sustainable technologies.

Objectives: The objectives of the National Auto Policy are:

- Increase contribution to GDP to support the growth of the automotive industry in India and become one of the major contributors to the country's GDP and comprise a considerable proportion of the manufacturing sector GDP by 2026.
- Increase exports to scale-up exports to 30-40% of the overall output over the next decade and improve the brand recognition, competitiveness, and technological advancement of the Indian automotive industry across the world.
- Drive employment generation and skill development to become a solid foundation for job creation in the automotive sector, both direct and indirect, over the next decade and become a major driver of the 'Skill India' program
- Increase local R&D investments to drive the R&D efforts in the automotive sector towards indigenous research, design, and engineering in both automotive vehicles and components.
- To promote clean, safe, efficient, and comfortable mobility for every person in the country, with a focus on environmental protection and affordability

For more information please [click here](#)

(<https://dhi.nic.in/writereaddata/UploadFile/National%20Automotive%20Policy%20Draft%20v2.pdf>)

4.3.2 Automotive Mission Plan 2016-26

The [Automotive Mission Plan 2016-26 \(AMP 2026\)](#) is the collective vision of Government of India (Government) and the Indian Automotive Industry on where the Vehicles, Auto-components, and Tractor industries should reach over the next ten years in terms of size, contribution to India's development, global footprint, technological maturity, competitiveness, and institutional structure and capabilities. AMP 2026 also seeks to define the trajectory of evolution of the automotive ecosystem in India including the glide path of specific regulations and policies that govern research, design, technology, testing, manufacturing, import/ export, sale, use, repair, and recycling of automotive vehicles, components, and services. AMP 2026 is a document that is aimed at multiple stakeholders in India and overseas and seeks to communicate the Government and industry's intent and objectives pertaining to the Indian Automotive industry, comprising the automotive vehicle manufacturers, the auto-component manufacturers and tractor manufacturers who operate in India.

The objective of the Automotive Mission Plan 2026 includes:

- To propel the Indian Automotive industry to become the engine of the "Make in India" programme.
- To make the Indian Automotive Industry a significant contributor to the "Skill India" programme.
- Promote safe, efficient, and comfortable mobility for every person in the country with an eye on environmental protection and affordability through both public and personal transport options.
- To seek increase of net exports of the Indian Automotive industry several fold.
- Promote comprehensive and stable policy dispensation for all regulations impacting the industry.

The AMP 2026 is aimed at bringing the Indian Automotive Industry among the top three of the worlds in engineering, manufacture and exports of vehicles & components; growing in value to over 12% of India GDP and generating an additional 65 million jobs.

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4.3.3 National Electric Mobility Mission Plan (NEMMP) 2020

[The National Electric Mobility Mission Plan 2020](#) is one of the most important and ambitious initiatives undertaken by the Government of India that has the potential to bring about a transformational paradigm shift in the automotive and transportation industry in the country. This is a culmination of a comprehensive collaborative planning for promotion of hybrid and electric mobility in India through a combination of policies aimed at gradually ensuring a vehicle population of about 6-7 million electric/hybrid vehicles in India by the year 2020 along with a certain level of indigenization of technology ensuring India's global leadership in some vehicle segments. It is a composite scheme using different policy-levers such as:

1. Demand side incentives to facilitate acquisition of hybrid/electric vehicles.

2. Promoting R&D in technology including battery technology, power electronics, motors, systems integration, battery management system, testing infrastructure, and ensuring industry participation in the same
3. Promoting charging infrastructure
4. Supply side incentives
5. Encouraging retro-fitment of on-road vehicles with hybrid kit

The 2020 roadmap estimates a cumulative outlay of about Rs.14000 cr. [1.86B Euro]. during the span of the scheme, including industry contribution.

National Electric Mobility Mission Plan (NEMMP) 2020 aims to achieve national fuel security by promoting hybrid and electric vehicles in the country. There is an ambitious target to achieve 6-7 million sales of hybrid and electric vehicles year on year from 2020 onwards. Government aims to provide fiscal and monetary incentives to kick start this nascent technology. With the support from the Government, the cumulative sale is expected to reach 15-16 Million by 2020. It is expected to save 9500 Million Litres of crude oil equivalent to Rs. 62000 Cr. [8.26B Euro] savings.

Under NEMMP, Department of Heavy Industry (DHI) had launched FAME scheme for promotion of hybrid & electric vehicles with an outlay of INR 795 crore in 2015. The overall scheme is proposed to be implemented over a period of 6 years, till 2020. The scheme has 4 focus areas i.e.

- I Technology development
- II Demand Creation,
- III Pilot Projects and
- IV Charging Infrastructure.

The FAME India Scheme is aimed at incentivizing all vehicle segments i.e., 2-Wheeler, 3-Wheeler Auto, Passenger 4-Wheeler Vehicle, Light Commercial Vehicles and Buses. The scheme covers Hybrid & Electric technologies like Mild Hybrid, Strong Hybrid, Plug in Hybrid & Battery EVs. FAME is designed to implement in a phased manner. Phase I of the FAME-India Scheme was initially proposed for two years viz. FY15-16 and FY16-17 but was extended from time to time till March 31, 2019 and with an enhancement in outlay from INR 795 crore to INR 895 crore.

Government has approved [FAME-II](#) in February 2019, which came into effect on April 1, 2019. The total outlay of INR 10,000 crore (€1.7 billion) has been made for three years till 2022 for FAME-II. The scheme is proposed to be implemented through the following verticals:

- Demand Incentives
- Establishment of network of Charging Stations
- Administration of Scheme including Publicity, IEC (Information, Education and Communication) activities.

A budget provision of Rs. 1000 Crore (€117 million) for a period of 3 years has been earmarked for establishment of charging infrastructure, which will be established as per "[Charging Infrastructure for Electrical Vehicles- Guidelines and Standards](#)" released by Ministry of Power.

[Read more/Download>>](#)

4.3.4 Guidelines and Standards for Charging Infrastructure for EVs: Ministry of Power

In Dec 2018, Ministry of Power (MoP) had come up with [guidelines and standards for charging infrastructure for electric vehicles](#) in India. Following clarities regarding charging infra were made in this document:

- Private charging at residences/offices shall be permitted. DISCOMs may facilitate the same.
- Setting up public charging stations (PCS) shall be a de-licenced activity, as long as it meets the technical and performance standards and the protocols, as laid down by the Ministry of Power and Central Electricity Authority.
- For setting up a PCS, the power distribution company will provide proper connectivity on priority and charging infrastructure can obtain electricity from any electricity generation company through open access.
- Specification for fast charging includes CCS, CHAdeMO or any fast charger as approved by DST/BIS with Rated Voltage (V) being in the range of 200V-750V.
- The guidelines further propose setting up at least one charging station in a grid of 3km x 3km in the cities; and on both sides of highways/roads at every 25km.
- In case of “long-distance EVs and heavy duty EVs like trucks/buses etc. there should be at least one fast-charging station at every 100km – one on each side of the highway/road.

In October 2019, Ministry of Power MoP) has approved amendments in Electric Vehicle (EV) Charging Guidelines and Specifications. ‘[Revised guidelines](#) will address the concerns of EV owners’ says the Minister At least one Charging Station to be available in a grid of 3 Km x 3 Km in the cities and one Charging Station at every 25 Km on both sides of highways/roads All Mega Cities & expressways connected to these Mega Cities to be taken up for coverage in first phase, other big cities to be taken up in second phase For inter-city travel, Fast Charging Station to be installed at every 100 KMs. Bureau of Energy Efficiency (BEE) nominated as the Central Nodal Agency to facilitate installation of Charging Infrastructure.

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4.3.5 Draft National Rail Plan

In an endeavour to address the inadequacies of capacity constraints and improve its modal share in total freight eco system of the country, Indian Railways has come up with Draft National Rail Plan.

A long-term strategic plan called the National Rail Plan has been developed to plan infrastructural capacity enhancement along with strategies to increase modal share of the Railways. The National Rail Plan will be a common platform for all future infrastructural, business, and financial planning of the Railways. This plan is being circulated among various Ministries for their views now. Railways aim to finalise the Final plan by January 2021.

The objective of the Plan is:

- To create capacity ahead of demand by 2030, which in turn would cater to growth in demand right up to 2050 and increase the modal share of Railways from 27%

currently to 45% in freight by 2030 as part of a national commitment to reduce Carbon emission and to continue to sustain it. Net Zero Carbon emission by 2030.

- To assess the actual demand in freight and passenger sectors, a yearlong survey was conducted over hundred representative locations by survey teams spread all over the country.
- Forecast growth of traffic in both freight and passenger year on year up to 2030 and on a decadal basis up to 2050.
- Formulate strategies based on both operational capacities and commercial policy initiatives to increase modal share of the Railways in freight to 45% by 2030.
- Reduce transit time of freight substantially by increasing average speed of freight trains from present 22Kmph to 50Kmph.
- Reduce overall cost of Rail transportation by nearly 30% and pass on the benefits to the customers.
- Map the growth in demand on the Indian Railway route map and simulate the capacity behaviour of the network in future.
- Based on above simulation identify infrastructural bottlenecks that would arise in future with growth in demand.
- Select projects along with appropriate technology in both track work, signalling and rolling stock to mitigate these bottlenecks well in advance.

As part of the National Rail Plan, [Vision 2024](#) has been launched for accelerated implementation of certain critical projects by 2024 such as 100% electrification, multitracking of congested routes, upgradation of speed to 160 kmph on Delhi-Howrah and Delhi-Mumbai routes, upgradation of speed to 130kmph on all other Golden Quadrilateral-Golden Diagonal (GQ/GD) routes and elimination of all Level Crossings on all GQ/GD route.

- Future projects for implementation beyond 2024 in both track and signalling have been identified with clear cut timelines for implementation.
- Three Dedicated Freight Corridors, namely East Coast, East-West & North-South identified along with timelines. PETS survey already underway.
- Several new High Speed Rail Corridors have also been identified. Survey on Delhi-Varanasi High Speed Rail already under way.
- Assess rolling stock requirement for passenger traffic as well as wagon requirement for freight.
- Assess Locomotive requirement to meet twin objectives of 100% electrification (Green Energy) by December 2023 and the increasing traffic right up to 2030 and beyond up to 2050.
- Assess the total investment in capital that would be required along with a periodical break up.
- Identify new streams of finance and models for financing including those based on PPP.
- For successful implementation of the National Rail Plan, the Railways will be looking to engage with Private Sector, PSUs, State Governments and Original Equipment Manufacturers (OEM)/Industries.
- Sustained involvement of the Private Sector in areas like operations and ownership of rolling stock, development of freight and passenger terminals, development/operations of track infrastructure etc.

In effect the National Rail Plan envisages an initial surge in capital investment right up to 2030 to create capacity ahead of demand and increase the modal share of the Railways in freight by 45%.

Post 2030, the revenue surplus generated would be adequate to finance future capital investment and take the burden of debt service ratio of the capital already invested. Exchequer funding of Rail projects would not be required.

[Read more/Download>>](#)

4.4 Electrical Equipment Including Consumer Electronics

4.4.1 Indian Electrical Equipment Mission Plan 2012-22

Indian Electrical Equipment Industry Mission Plan seeks to steer, coordinate, and synergise the efforts of all stakeholders to accelerate and sustain the growth of the domestic electrical equipment industry.

It identifies five key areas for action:

- **To enhance industry competitiveness**, the Mission Plan calls for providing a level playing field in the country to domestic electrical equipment manufacturers vis-à-vis foreign manufacturers, replacing the L1 criteria of procurement by power utilities in India with two part bidding, augmenting domestic testing facilities to cover the type testing of all equipment, mandating type testing of imported small equipment in Indian labs, supporting SMEs in technology up gradation and testing, standardisation of product ratings and specifications of electrical equipment, providing funds at globally competitive rates of interest to domestic manufacturers, establishing clusters of electrical and component manufacturers and providing them funds for technology up gradation.
- **For technology up gradation**, the Mission Plan recommends a coordinated and collaborative effort by industries and utilities. For any R&D project, the user organisation or main beneficiary should be supported by the government for leading the research in a planned and committed manner. It also recommends public-private partnership (PPP) for fast development of new technology / systems.
- **Under skill development**, it is suggested to set up a Sector Skill Council (SSC), which will undertake skill mapping and interact with the industry to provide training to the workers and also train the trainers / teachers, propose changes in curriculum, etc. It will also arrange for accreditation of the institutes and certification of the students. The Mission Plan calls for greater involvement of industry in the periodic review of the curriculum of technical institutes, summer training of students and for guest lectures by industry experts.
- **To boost exports Electrical Equipment**, the Mission Plan recommends providing policy support to domestic manufacturers to enhance their competitiveness in the global market and address issues of quality of the products, high transaction costs, non-recognition of test certificates of CPRI by some countries, high cost of production, high cost of finance, etc. The Mission Plan calls for more project specific lines of credit by the EXIM Bank to other countries with an emphasis on acceptance of equipment / material only from India for such projects.

- **To convert the latent demand for power in the country**, the Mission Plan calls for timely completion of power generation projects and the downstream transmission projects for evacuation of power and improvement in the health of power distribution companies. It recommends the State Governments to acquire land, construct approach roads, and arrange construction power supply and other clearances, with the project developers reimbursing the costs. It suggests that urban areas with high aggregate technical & commercial losses be handed over to private sector on the input-based franchisee model with the provision for investment by the franchisee for system improvement, with the franchisee being asked to set up decentralised distribution-cum-generation (DDG) projects in identified rural areas.

Detailed recommendations have been formulated for strategic and policy interventions in these five critical areas that need to be addressed by the industry, with support from the government. The Mission Plan envisages to make India the country of choice to produce electrical equipment and reach an output of US \$100 billion by balancing imports and exports. It has been evolved by the Department of Heavy industry through an elaborate exercise involving all stakeholders and with the support of the Indian Electrical and Electronics Manufacturers' Association (IEEMA).

For More Details [Click Here](#)

4.4.2 National Smart Grid Mission (NSGM)

Ministry of Power (MoP) launched **National Smart Grid Mission** in 2015 with aims to accelerate Smart Grid deployment in India. Smart Grid is an evolving set of various technologies, especially information and communication technologies (ICT), working together to improve the present grid. Being an evolving technology, it is difficult to define it. Further, the applications of smart grid shall depend on the location and the requirements, henceforth its definition. India is presently spearheading some of the largest transformation projects with technology interventions for building smart cities, renewable energy, and power grid modernization.

NSGM functions with [three tier hierarchical structure](#) as follows:

- 1st Level – [Governing Council](#), headed by Minister of Power.
- 2nd Level – [Empowered Committee](#), headed by Secretary (Power).
- Supportive Level – [Technical Committee](#), headed by Chairperson CEA.
- 3rd Level – [NSGM Project Management Unit](#).

NSGM has its own resources, authority, functional & financial autonomy to plan and monitor implementation of the policies and programs related to Smart Grids in the country. Presently, the efforts for the development and deployment of Smart Grids in India are being carried out through India Smart Grid Task Force (ISGTF) and India Smart Grid Forum (ISGF) under the aegis of Ministry of Power (MoP).

So far, following projects have been sanctioned under National Smart Grid Mission:

- [CED, Chandigarh \(Sub Division 5\)](#)
- [CED, Chandigarh \(Complete City excluding Sub Div 5\)](#)
- [KSEB, Thiruvananthapuram \(Kochi\)](#)
- [JBNVL, Jharkhand \(Ranchi\)](#)
- [OPTCL, Odisha \(Rourkela\)](#)

Read more about NSGM [here>>](#)

Smart Grid Vision and Road map for India:

In 2013, Ministry of Power (MoP) has released “Smart Grid Vision and Road map for India” that offers a series of time-framed, specific, target driven measures, across these different areas, with which to enable the development of an Indian Smart grid model.

Vision:

“Transform the Indian power sector into a secure, adaptive, sustainable and digitally enabled ecosystem that provides reliable and quality energy for all with active participation of stakeholders”.

The Roadmap had been prepared by the India Smart Grid Task Force (ISGTF) and India Smart Grid Forum (ISGF), and covers the 12th, 13th, and 14th 5-year plan periods from 2012 to 2027.

[Read more about SG Vision and Roadmap for India>>](#)

4.4.3 Smart Meter National Programme

The Smart Meter National Programme is being implemented by Energy Efficiency Services Limited (EESL), a Joint Venture (JV) of Public Sector Undertakings (PSUs) under Ministry of Power to deploy smart meters across the country. Smart metering is essentially the first step towards a smart grid. A new range of ‘Smart meters’ can bring efficiency to how India manages its electricity, by checking data-entry errors and billing efficiencies, and cutting the costs of manual meter reading through web-based monitoring system.

With its pioneering role in India’s energy efficiency journey, EESL’s Smart Meter National Programme (SMNP) is working to eventually replace 25 crore (250 million) conventional meters with smart meters across India. By bringing standardized solutions based on the GPRS technology, these meters will ease integration in the sector, while cutting capital costs and boosting efficiency in billing and collection. Customers will also benefit from accurate bill readings, and real-time understanding of their electricity usage, catalysing a pan-India movement towards energy efficiency.

Under this programme, EESL has completed the procurement process of 1.5 crore smart meters. As on date, EESL has installed over 13.2 lakh smart meters in Uttar Pradesh, New Delhi, Haryana, and Bihar under this programme.

[Read more>>](#)

4.5 Smart City

4.5.1 Smart City Mission, Government of India

The objective of the Smart Cities Mission is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of ‘Smart’ Solutions. The focus is on sustainable and

inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities.

The Smart Cities Mission of the Government is a bold, new initiative. It is meant to set examples that can be replicated both within and outside the Smart City, catalysing the creation of similar Smart Cities in various regions and parts of the country. Accordingly, the purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes.

Area-based development will transform existing areas (retrofit and redevelop), including slums, into better planned ones, thereby improving liveability of the whole City. New areas (Greenfield) will be developed around cities to accommodate the expanding population in urban areas.

Application of Smart Solutions will enable cities to use technology, information, and data to improve infrastructure and services. Comprehensive development in this way will improve quality of life, create employment, and enhance incomes for all, especially the poor and the disadvantaged, leading to inclusive Cities.

Under Smart City Mission, Government of India has announced names of 100 smart cities across India. The total proposed investment in the 100 Smart Cities would be INR **2,05,018 Crore (€24 Billion)**.

The Smart Cities Mission Dashboard is as below:

- Total Winning Proposals are 100.
- Total Urban Population Impacted is **99,630,069**
- Total Cost of Projects (₹ Cr.) (Including Other Cost - O&M, Contingency, etc.) is **2,05,018 Cr. (€24 billion)**
- Total Area Based Development Cost (₹ Cr.) is **164,204** [€19.3 Billion]
- Total Pan City Solution Cost (₹ Cr.) is **38,914** [€4.6 Billion]

For more information on [Smart Cities Guidelines](#)

For other related information please click [here](#) and [here](#) and [here](#)

4.5.2 Indian Urban Data Exchange (IUDX)

In February 2021, Ministry of Housing and Urban Affairs (MoHUA) launched India Urban Data Exchange (IUDX), which has been developed in partnership between the Smart Cities Mission and the Indian Institute of Science (IISc), Bengaluru. IUDX serves as a seamless interface for data providers and data users, including ULBs, to share, request, and access datasets related to cities, urban governance, and urban service delivery.

IUDX is an open-source software platform which facilitates the secure, authenticated, and managed exchange of data amongst various data platforms, 3rd party authenticated and authorised applications, and other sources. As the number of cities on IUDX expands, this will scale up to uniform and seamless sharing between data producers and data consumers across urban India. IUDX is designed to address the problem of data silos, both within and across cities. Cities generate large volumes of data, which are recorded by a wide range of entities, both within government and across industry, academia, and

civil society. The combination of these datasets can enable rapid innovation, as well as a better understanding of and planning for urban needs and challenges. IUDX creates a secure and reliable channel for data producers or owners to share their data, with complete control over what is shared and with whom, to enable sharing while addressing security and privacy protections by design.

This initiative also has the guidance and support of MEITY and NITI Aayog, who serve as members of the Board of Advisors of IUDX. As the platform rolls out, it will help tap into the power of data held across all urban stakeholders.

[FIWARE Foundation teams up with IUDX Program over Open Source to Provide a Standard Smart City Platform for Indian Cities](#)

FIWARE Foundation, a non-profit organization that encourages the adoption of open standards — implemented using Open-Source technologies — for the development of smart solutions on a global basis, announced a joint collaboration with the IUDX Program in November 2020, toward building an Open Source platform that facilitates secure, authenticated and managed exchange of data amongst various data sources and consumers.

Joint adoption and contribution to standards: FIWARE and the IUDX Program will collaborate on joint adoption and contribution to standards. IUDX Program will adopt ETSI's NGSI-LD Application Programming Interfaces (API) specifications for its resource server, which is the same standard adopted by the FIWARE Context Broker. The FIWARE Context Broker enables organisations — from public administrations to private companies — to collect, manage and share context of information. It is a dynamic system able to inform in real-time time what is currently happening in each city, from traffic status to air quality data. The Context Broker technology was developed as the core component of the FIWARE platform.

Other related documents:

- [IUDX technical overview>>](#)
- [The India Urban Data Exchange: An overview of Rationale, Architecture and Methodology>>](#)
- [Discussion Paper on Data Exchange Framework for Indian Smart Cities](#)

For more information about IUDX, please [click here](#)

4.5.3 White paper on “Smart Cities in India: Framework for ICT infrastructure: TRAI

In September 2020, Telecom Regulatory, TRAI, has also released a [white paper on “Smart Cities in India: Framework for ICT infrastructure”](#). The white paper highlights the Role of digital technologies for smart cities, discusses the key smart solutions, deliberates the need of Global Standardization and connectivity related aspects specific to smart cities, and tries to identify the framework for ICT Infrastructure for the success of Smart Cities Mission in India.

[Read more/Download>>](#)

4.6 Make in India/Manufacturing

4.6.1 Make in India!

Indian Government launched the Make in India initiative on September 25, 2014, with the primary goal of making India a global manufacturing hub, by encouraging both multinational as well as domestic companies to manufacture their products within the country. Led by the Department of Industrial Policy and Promotion, the initiative aims to raise the contribution of the manufacturing sector to 25% of the Gross Domestic Product (GDP) by the year 2025 from its current 16%. Make in India has introduced multiple new initiatives, promoting foreign direct investment, implementing intellectual property rights, and developing the manufacturing sector.

The major objective behind the initiative is to focus on job creation and skill enhancement in 25 sectors of the economy. The initiative also aims at high quality standards and minimizing the impact on the environment. The initiative hopes to attract capital and technological investment in India.

The initiative is built on four pillars which are as follows:

1. **New Processes:** The government is introducing several reforms to create possibilities for getting Foreign Direct Investment (FDI) and foster business partnerships. Some initiatives have already been undertaken to alleviate the business environment from outdated policies and regulations. This reform is also aligned with parameters of World Bank's 'Ease of Doing Business' index to improve India's ranking on it. [India stands at 63, among 190 countries, in the World Bank's Ease of Doing Business 2020 survey](#). India also ranked as the 52nd most innovative nation in the Global Innovation Index (GII) 2019 published by the World Intellectual Property Organization (WIPO).
2. **New Infrastructure:** Infrastructure is integral to the growth of any industry. The government intends to develop industrial corridors and build smart cities with state-of-the-art technology and high-speed communication. Innovation and research activities are supported by a fast-paced registration system and improved infrastructure for Intellectual Property Rights (IPR) registrations. Along with the development of infrastructure, the training for the skilled workforce for the sectors is also being addressed.
3. **New Sectors:** 'Make in India' has identified 25 sectors to promote with the detailed information being shared through an interactive web-portal. The Government has allowed 100% FDI in Railway and removed restrictions in Construction. It has also recently increased the cap of FDI to 100% in Defence and Pharmaceutical. India ranked as the 9th largest recipient of FDI in 2019 according to World Investment Report 2020 by United Nations Conference on Trade and Development (UNCTAD).
4. **New Mindset:** Government in India has always been a regulator and not a facilitator. This initiative intends to change this by bringing a paradigm shift in the way Government interacts with various industries. It will focus on acting as a partner in the economic development of the country alongside the corporate sector.

For more information, please click [here](#)

4.6.2 National Capital Goods Policy 2016

To unlock the potential for manufacturing sector and to establish India as a global manufacturing powerhouse under Make in India initiative, Government has unveiled a National Capital Goods Policy 2016.

The primary objective of the Capital Goods policy is to increase the contribution of the Capital Goods sector from the current 12% to 20% of total manufacturing activity by 2025. Through this Policy, India aims to feature among the leading capital goods producing nations in the world.

Under the National Capital Goods policy which is under the aegis of the Department of Heavy Industries and Public Enterprises, the government has a clear mission to achieve an increase in production from USD 35 billion in FY 2014-15 to USD 115 billion in 2025. The agenda also envisages increasing exports from the current 27% to 40% of production. It emphasises on raising the share of domestic production in India's demand from 60% to 80% to make the country an exporter of capital goods.

Apart from the objectives mentioned above, the target of the National Capital Goods Policy is to ensure improvement in technology across sub-sectors, increase availability of skilled labour and promote growth and capacity building of MSMEs.

[Read more/Download>>](#)

4.6.3 Production Linked Incentive (PLI) scheme

Government of India notified "Production linked incentive scheme (PLI) for Large Scale Electronics Manufacturing" vide [Gazette Notification No.CG-DL-E-01042020-218990 dated April 01, 2020](#) which offers a production linked incentive to boost domestic manufacturing and attract large investments in mobile phone manufacturing and specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units. The Scheme would tremendously boost the electronics manufacturing landscape and establish India at the global level in electronics sector.

The scheme shall extend an incentive of 4% to 6% on incremental sales (over base year) of goods manufactured in India and covered under target segments, to eligible companies, for a period of 5 years after the base year as defined.

In November 2020, Government has announced Production-Linked Incentives (PLI) worth up to Rs 1.46 lakh crore (€17.2 billion) for 10 key manufacturing sectors for Enhancing India's Manufacturing Capabilities and Enhancing Exports – Atmanirbhar Bharat (Self Reliant India). The sectors include Advanced chemistry cells (ACC), automobiles and auto components, Telecom & Networking Products, technology products, pharmaceutical drugs, capital goods, textile products, white goods, food products, and speciality steel.

[Read more](#)

For more information about PLI scheme, please [click here](#)

4.7 Energy Efficiency/ Environment

4.7.1 Draft National Resource Efficiency Policy, 2019

The Ministry of Environment, Forests and Climate Change has proposed a draft **National Resource Efficiency Policy 2019**. It aims to streamline the efficient use of these resources with minimum negative impact on environment.

Key features of the policy:

1. It seeks to set up **a National Resource Efficiency Authority (NREA)** with a core working group housed in the Ministry of Environment, Forest and Climate Change and a members group with representations from different ministries, state/union territory, and other stakeholders.
2. The authority would be supported by an **Inter-Ministerial National Resource Efficiency Board** to guide on the aspects critical to its implementation.
3. It also plans to **offer tax benefits** on recycled materials, green loans to small and medium Enterprises (SMEs) and soft loans to construct waste disposal facilities, apart from setting up **Material Recovery Facilities (MRF)**.
4. Manufacturers and service providers would also be required to use more recycled or renewable materials and awareness would be created among consumers to indicate the shift.
5. Idea of the national policy is to drive the country towards **circular economy** through efficient use of available material resources, based on principle of 6R and 'green public procurement'.
6. **The 6R stands for reduce, reuse, recycle, redesign, re-manufacture and refurbish** while the very premise of 'green public procurement' is to procure products with lower environmental footprints such as secondary raw materials and locally sourced materials.
7. It also pitches for moving towards '**zero landfill**' approach in the country, hinting at possibility of imposing 'landfill taxes' and 'high tipping fees' for bulk generators of waste so that they can move towards optimal use of materials and better waste management.

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4.7.2 Strategy paper on Resource Efficiency: NITI Aayog

In November, 2017, NITI Aayog along with EU Delegation to India had prepared a [Strategy paper on Resource Efficiency](#). The objective of the RE Strategy is to make recommendations for enhancing the resource-use efficiency in the Indian economy and industry, develop indicators for monitoring progress, and create an ecosystem for improving the resource security and minimising environmental impacts.

Following up on this strategy paper, in January 2019, a status paper titled "[Resource Efficiency & Circular Economy – Current status and Way forward](#)" has also been prepared with four focus areas namely steel, aluminium, E-waste and Construction and Demolition waste. This status paper is based on findings from sectoral strategy papers on steel, aluminium, E-waste and Construction and Demolition waste prepared by concerned ministries/departments in association with NITI Aayog and other key stakeholders including EU delegation to India.

The status paper brings out 30 recommendations out of which following 14 recommendations have identified as priority actions.

S. No.	Category	Recommendations	Implementing Agencies	Timelines
1	Policies	Formulate a national policy on RE/CE for biotic and abiotic resources addressing various lifecycle stages and key stakeholders.	MoEFCC	6 months - 1 year
2		Formulate a national policy on Sustainable Public Procurement (SPP) with an action plan emphasizing procurement of RE & CE products.	MoF	6 months - 1 year
3	Programmes and Mainstreaming	Mainstream RE/CE initiatives by leveraging existing flagship programmes and schemes like Swachh Bharat Abhiyan, Smart Cities Make in India, Start-up India, Digital India and others.	MoEFCC, MoHUA, MDWS, MCI-DIPP, MeitY	6 months - 1 year
4		Create a fund on similar lines as the National Clean Energy and Environment fund to finance infrastructure, innovative technologies and related RE/CE initiatives.	MoF	6 months - 1 year
5	Regulation	Establish a national coordinating body- Bureau of Resource Efficiency (BRE) to implement and achieve national RE/CE goals.	NITI Aayog, MoEFCC, MoCA	1-2 years
6		Establish and mandate a 'Consent to Close' requirement for medium and large-scale industries in the 'RED' category to ensure that waste streams are responsibly managed and recycled after closure.	MoEFCC/CPCB	6 months - 1 year
7		Rationalise tax regime on critical virgin raw materials to make secondary raw materials price competitive	MoF	6 months - 1 year
8	Setting up a dynamic recycling industry	Promote the establishment of Material Recovery Facilities (MRFs) with the allocation of land in urban areas and industrial estates.	MoEFCC, MoHUA, MeitY	1-2 years
9		Establish a remanufacturing council or an association to spur growth of remanufacturing industry	Industry, industrial associations	1-2 years

10	R&D and Technology Development	Support R&D to develop scalable technologies for RE/CE and promote usage of Artificial Intelligence (AI) for higher efficiencies	DST, MoEFCC, MoHUA, MoA, MoS, MoM	1-2 years
11		Create and manage knowledge platforms that facilitate open innovation, provide access to experts, and engage academia to support the transition towards RE/CE.	MHRD, MoEFCC	1-2 years
12	Capacity Development, Outreach & Monitoring	Provide capacity development support on RE/CE for ministries/departments at the National and State levels.	NITI Aayog/ MHRD/ EU-REI3	6 months - 1 year
13		Develop and promote programmes and certifications for skill development of the informal sector N	NSDC, SCGJ	1-2 years
14		Develop monitoring and outcome indicators for tracking progress on RE/CE.	NITI Aayog/ MoEFCC/ State Governments	1-2 years

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5. Project Priority Sectors and its key players

Standard formulation is a comprehensive procedure which requires engagement of all the key stakeholders. These key players in each of the priority sector play a significant role in the formulation of standards and steer the direction of the technologies and emerging trends.

Policy and Legislation and National Regulatory requirements are drafted and issued by the concerned Ministry or Government Department, providing foundation for the Standardization bodies to make standards. Similarly, the Industry players contribute to the standards formulation by bringing their requirements, technical specifications, and other important inputs.

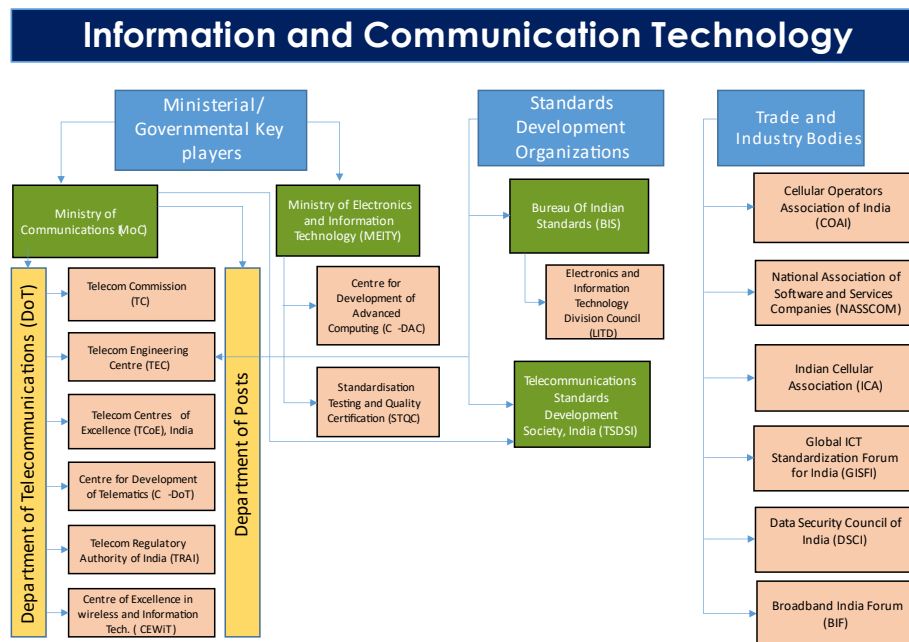
In this section, our endeavour is to familiarize you with the main players of each of the priority sector Project SESEI is responsible covering Information and Communications Technology (ICT), Automotive, Smart Cities, Electrical Equipment including Consumer Electronics. We have categorized this under the following headings and order:

- **Government**
- **Standards Development Organizations**
- **Trade & Industry Association**

The who's who of the priority sector identified for the Project are as under.

5.1. Information and Communications Technology (ICT)

The Information and Communication Technology is a dynamic sector globally. The Ministerial / governmental key players in India in the ICT sector are covered in the following section.



5.1.1. Government

5.1.1.1. Ministry of Communications

Ministry has two departments- Department of Telecommunications and Department of Posts under its control.

1. Department of Telecommunications (DoT)

The Department of Telecommunications (DoT) is a department of the Ministry of Communications of the executive branch of the Government of India.

The Department of Telecom has been formulating developmental policies for the accelerated growth of the telecommunication services. The Department is also responsible for grant of licenses for various telecom services like Unified Access Service Internet and VSAT service. The Department is also responsible for frequency management in the field of radio communication in close coordination with the international bodies. It also enforces wireless regulatory measures by monitoring wireless transmission of all users in the country.

The main objectives of the Departments of Telecommunication are administration of laws with respect to any of the matters such as:

- The Indian Telegraph Act, 1885 (13 of 1885);
- The Indian Wireless Telegraphy Act, 1933 (17 of 1933); and
- The Telecom Regulatory Authority of India Act, 1997 (24 of 1997).
- Policy, Licensing and Coordination matters relating to telegraphs, telephones, wireless, data, facsimile and telematics services etc.

- International cooperation in matters connected with telecommunications including matters relating to all international bodies dealing with telecommunications such as International Telecommunication Union (ITU), its Radio Regulation Board (RRB), Radio Communication Sector (ITU-R), Telecommunication Standardization Sector (ITU-T), Development Sector (ITU-D), International Telecommunication Satellite Organization (INTELSAT), International Mobile Satellite Organization (INMARSAT), Asia Pacific Telecommunication (APT).
- Promotion of standardization, research, and development in telecommunications.
- Promotion of private investment in Telecommunications.
- Financial assistance for the furtherance of research and study in telecommunications technology and for building up adequately trained manpower for telecom programme, including assistance to institutions, assistance to scientific institutions and to universities for advanced scientific study and research; and
- Responsible for matters relating to Telecom Engineering Center (TEC), Centre for Development of Telematics (C-DOT), Bharat Sanchar Nigam Limited, Mahanagar Telephone Nigam Limited, Indian Telephone Industries Limited, Videsh Sanchar Nigam Limited and Telecommunications Consultants (India) Limited and Post disinvestment matters relating to M/s Hindustan Teleprinters Limited etc.

[Read more>>](#)

Department of telecom has following key Units/Functions:

a) Telecom Commission (TC)

The Telecom Commission was set up by the Government of India vide the Resolution dated 11th April, 1989 with administrative and financial powers of the Government of India to deal with various aspects of Telecommunications. This is one of the key departments within the DoT and is responsible for approving overall telecommunications policy formulation including industrial policy, national telecommunications roll-out planning and promotion, licensing, tariff, etc. The Telecom Commission is responsible for:

1. Formulating the policy of Department of Telecommunications for approval of the Government.
2. Preparing the budget for the Department of Telecommunications for each financial year and getting it approved by the Government; &
3. Implementation of Government's policy in all matters concerning telecommunication.

For more information on Department of Telecom & Telecom Commission please click [here](#)

b) Telecom Engineering Centre (TEC)

The **Telecommunication Engineering Center (TEC)** is a technical body and a nodal agency of the Department of Telecommunications, Ministry of Communications, Government of India responsible for drawing up of standards, generic requirements, interface requirements, service requirements and specifications for telecom products, services and networks.

For more information on TEC please click [here](#)

c) Centre for Development of Telematics (C-DOT)

The Centre for Development of Telematics (C-DOT) is the Telecom Technology Development Centre of the Government of India. It was established in August 1984 as an autonomous body. It was vested with full authority and total flexibility to develop state-of-the-art telecommunication technology to meet the needs of the Indian telecommunication network.

The main objectives of the CDOT are.

- Work on telecom technology products and services.
- Provide solutions for current and future requirements of telecommunication and converged networks including those of national importance especially related to rural applications, strategic sector, and security agencies etc.
- Provide market orientation to R&D activities and sustain C-DOT as a centre of excellence.
- Build partnerships and joint alliance with academia, industry, solution providers, Telcos and other R&D organizations to offer cost effective solutions.
- Support Telcos and service providers in the introduction of new technologies like IoT/M2M, 5G, AI etc. features and services by optimal utilization of installed networks, pilots and studies.
- To strengthen the Indian telecom manufacturing base, by transfer of technologies developed by C-DOT.

For more information on CDOT Solutions, [Products](#) and [Services](#) please click [here](#)

d) Telecom Regulatory Authority of India (TRAI)

The entry of private service providers brought with it the inevitable need for independent regulator. The Telecom Regulatory Authority of India (TRAI) was, thus, established with effect from 20th February 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services, including fixation/revision of tariffs for telecom services which were earlier vested in the Central Government.

One of the main objectives of TRAI is to provide a fair and transparent policy environment which promotes a level playing field and facilitates fair competition. In pursuance of this objective TRAI has issued from time to time many recommendations, orders and directives to deal with issues coming before it and provided the required direction to the evolution of Indian telecom market from a Govt. owned monopoly to a multi operator multi service open competitive market.

The directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection, and quality of service as well as governance of the Authority. The TRAI Act was amended by an ordinance, effective from 24 January 2000, establishing a Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) to take over the adjudicatory and disputes functions from TRAI. TDSAT was set up to adjudicate any dispute between a licensor and a licensee, between two or more service providers, between a service provider and a group of consumers, and to hear and dispose of appeals against any direction, decision, or order of TRAI.

For more information on TRAI recommendation, regulation, publication please click [here](#)

e) Center of Excellence in Wireless and Information Technology (CEWiT)

The Centre of Excellence in Wireless Technology (CEWiT) is an autonomous research Society of IIT Madras set up by Ministry of Communications and IT in partnership with the Indian telecom industry. CEWiT's vision is to provide technological leadership to the Indian wireless industry and address the needs of the Indian market through advanced R&D and value creation. CEWiT works as a neutral partner to industry stakeholders and policy makers on various technological aspects of the wireless communication industry. The Centre has several experts in the Radio access technologies, specifically focusing on 4G and 4G-Advanced technologies like LTE and WiMAX. CEWiT also provides technical leadership to the Broadband Wireless Consortium of India.

- CEWiT with its vast knowledge and experience base provides consultancy and technical services to Telecom companies in India in the areas of 4G technologies like LTE and LTE-Advanced and the upcoming 5G technologies.
- It has built simulators and test beds which benefit the industry in its R&D and capacity building activities. CEWiT plays a key role in building a dynamic wireless R&D ecosystem in India.
- CEWiT actively collaborates with various technological institutes and R&D organizations in India and abroad. Various collaboration models are followed to suit the institute and the project context

For more information on CeWIT please click [here](#)

f) Telecom Centres of Excellence (TCOE), India

Telecom Centres of Excellence, set up in Public Private Partnership (PPP) mode, are an example of the Government, the Academia and the Industry working together for the sustained growth and progress of the country in the Telecom sector. The idea of Telecom Centres of Excellence was initiated with the shared realization, by the Government and the Telecom Industry, that boosting the growth of telecommunications was essential for the overall progress of the country. It was conceptualized in May 2007 and brought into existence by February 2008 with the signing of 7 MoUs between DoT, participating premier Academic Institutes and the sponsors from the Telecom Industry. The eighth TCOE with participation of Railtel came up in June 5th, 2013. The TCOEs set up in Public Private Partnership (PPP) mode, are an excellent example of the Government, the Academia and the Industry working together for the sustained growth and progress of the country.

The eight largest Telco's have joined the initiative as Principal Sponsors. The pairing and focus areas of each centre were as follows: -

- Aircel is with TCOE at IISc Bangalore - Information security and Disaster Management of Telecom Infrastructure
- Bharat Sanchar Nigam Ltd. (BSNL) is with TCOE at IIT, Kanpur - Multimedia and Telecom, Cognitive Radio and Computational Mathematics
- Bharti Airtel is with TCOE at IIT Delhi - Telecom Technology and Management
- Idea Cellular is with TCOE at IIM Ahmedabad - Telecom Policy, Regulation, Customer care
- Reliance Communications is with TCOE at IIT Madras - Telecom Infrastructure (Active and Passive) and Energy
- Tata Teleservices is with TCOE at IIT Bombay - Rural Telecom Technology
- Vodafone is with TCOE at IIT Kharagpur - Next Generation Networks and Technology
- RailTel is with TCOE at IIT Roorkee ICT and Broadband Applications

TCOE's are created for promoting development of new technologies, to generate IPRs, incubate innovations and promote entrepreneurship to position India as a global leader in telecom innovation and making India a hub of telecom equipment manufacturing.

For more information on TCOE, please click [here](#)

2. Department of Posts (DoP)

The **Department of Posts (DoP)**, trading as **India Post**, is a government-operated postal system in India. Generally referred to within India as "the post office", it is the most widely distributed postal system in the world. The postal service is under the Department of Posts, which is part of the Ministry of Communications of the Government of India.

For more than 150 years, the Department of Posts (DoP) has been the backbone of the country's communication and has played a crucial role in the country's social economic development. It touches the lives of Indian citizens in many ways: delivering mails, accepting deposits under Small Savings Schemes, providing life insurance cover under Postal Life Insurance (PLI) and Rural Postal Life Insurance (RPLI) and providing retail services like bill collection, sale of forms, etc. The DoP also acts as an agent for Government of India in discharging other services for citizens such as [Mahatma Gandhi National Rural Employment Guarantee Scheme \(MGNREGS\)](#) wage disbursement and old age pension payments. With 1,55,531 Post Offices, the DoP has the most widely distributed postal network in the world.

Vision:

- India Post's products and services will be the customer's first choice.

Mission:

- To sustain its position as the largest postal network in the world touching the lives of every citizen in the country.
- To provide mail parcel, money transfer, banking, insurance and retail services with speed and reliability.
- To provide services to the customers on value-for-money basis.
- To ensure that the employees are proud to be its main strength and serve its customers with a human touch.
- To continue to deliver social security services and to enable last mile connectivity as a Government of India platform.

For more information, please click [here>>](#)

5.1.1.2. Ministry of Electronics and Information Technology (MeitY)

The Ministry of Electronics and Information Technology (MeitY) is an executive agency of Government of India. It was carved out of the Ministry of Communications and Information Technology on 19 July 2016 as a standalone ministerial agency responsible for IT policy, strategy, and development of the electronics industry.

Vision:

- e-Development of India as the engine for transition into a developed nation and an empowered society.

Mission:

- To promote e-Governance for empowering citizens, promoting the inclusive and sustainable growth of the Electronics, IT & ITeS industries, enhancing India's role in Internet Governance, adopting a multipronged approach that includes development of human resources, promoting R&D and innovation, enhancing efficiency through digital services, and ensuring a secure cyber space.

Objectives:

- **e-Government:** Providing e-infrastructure for delivery of e-services.
- **e-Industry:** Promotion of electronics hardware manufacturing and IT-ITeS industry
- **e-Innovation / R&D:** Implementation of R&D Framework - Enabling creation of Innovation/ R&D Infrastructure in emerging areas of ICT&E/Establishment of mechanism for R&D translation
- **e-Learning:** Providing support for development of e-Skills and Knowledge network
- **e-Security:** Securing India's cyber space.
- **e-Inclusion:** Promoting the use of ICT for more inclusive growth.
- **Internet Governance:** Enhancing India's role in Global Platforms of Internet Governance.

Key Functions:

1. Policy matters relating to information technology; Electronics; and Internet (all matters other than licensing of Internet Service Provider).
2. Promotion of internet, IT and IT enabled services.
 - a) Promotion of Digital Transactions including Digital Payments.
4. Assistance to other departments in the promotion of E-Governance, E- Commerce, E- Medicine, E- Infrastructure, etc.
5. Promotion of Information Technology education and Information Technology-based education.
6. Matters relating to Cyber Laws, administration of the Information Technology Act. 2000 (21 of 2000) and other IT related laws.
7. Matters relating to promotion and manufacturing of Semiconductor Devices in the country excluding all matters relating to Semiconductor Complex Limited (SCL), Mohali.
8. Interaction in IT related matters with international agencies and bodies e.g., Internet for Business Limited (IFB), Institute for Education in Information Society (IBI) and International Code Council – online (ICC).
9. Initiative on bridging the Digital Divide: Matters relating to Digital India Corporation (DIC).
10. Promotion of Standardization, Testing and Quality in IT and standardization of procedure for IT application and Tasks.
11. Electronics Export and Computer Software Promotion Council (ESC).
12. National Informatics Centre (NIC).
13. Initiatives for development of Hardware/Software industry including knowledge-based enterprises, measures for promoting IT exports and competitiveness of the industry.
14. All matters relating to personnel under the control of the Ministry.
15. Unique Identification Authority of India (UIDAI).

For more information on this Ministry please click [here](#)

MEITY has following key Units:

a) Centre for Development of Advanced Computing (C-DAT)

C-DAC is the premier R&D organization of the Ministry of Electronics and Information Technology (MeitY) for carrying out R&D in IT, Electronics, and associated areas. Different areas of C-DAC had originated at different times, many of which came out because of identification of opportunities.

- The setting up of C-DAC in 1988 itself was to build Supercomputers in context of denial of import of Supercomputers by USA. Since then, C-DAC has been undertaking building of multiple generations of Supercomputer starting from PARAM with 1 GF in 1988.
- Almost at the same time, C-DAC started building Indian Language Computing Solutions with setting up of GIST group (Graphics and Intelligence based Script Technology); National Centre for Software Technology (NCST) set up in 1985 had also initiated work in Indian Language Computing around the same period.

For more information, please [click here](#)

b) Standardisation Testing and Quality Certification (STQC)

STQC Directorate, an attached office of the Ministry of Electronics and Information Technology, Government of India, provides quality assurance services around Electronics and IT through countrywide network of laboratories and centres. The services include Testing, Calibration, IT & e-Governance, Training and Certification having National / International accreditation and recognitions around testing and calibration.

Besides a network of ERTL and ETDC which are primarily engaged in testing and calibration services, STQC has specialized institutions such as Indian Institute of Quality Management (IIQM) for quality related training programmes and Centre for Reliability (CFR) for reliability related services.

In the area of IT & e-Governance, STQC provides Software Products/Systems and Process Assurance Services by conducting Testing, Training, Audit and Certifications.

All STQC financial obligations are met through budgetary support provided by Government of India.

For more information, please [click here](#)

5.1.2. Standards Development Organizations

5.1.2.1. Electronics and Information Technology Division Council (LITDC): BIS

The LITDC (Electronics & IT Division Council) of Bureau of Indian Standards (BIS) is responsible for Standardization in the field of electronics and telecommunications including Information Technology same as CEN-CENELEC activities in ICT sector. The national Standards are formulated based on the concept of Consensus by the Division Councils and the Sectional Committees under LITDC.

Within LITDC, 35 Technical Committees have so far developed [over 1650 Indian Standards](#). For more information please [click here](#)

5.1.2.2. Telecommunication Standards Development Society for India (TSDSI)

TSDSI (Telecommunications Standards Development Society, India) is an SDO that aims at developing and promoting India-specific requirements, standardizing solutions for meeting these requirements and contributing these to international standards, contributing to global standardization in the field of telecommunications, maintaining the technical standards and other deliverables of the organization, safe-guarding the related IPR, helping create manufacturing expertise in the country, providing leadership to the developing countries (such as in South Asia, South East Asia, Africa, Middle East, etc.) in terms of their telecommunications-related standardization needs.

A consensus-based approach is followed towards standards development by involving all stake holders - Government, Academia and Industry. TSDSI follows the principles of Openness, Transparency, Fairness, Consensus and Due Process in conducting its activities. It maintains technology neutrality and provide a uniform playing field for all its members.

The TSDSI is not for profit legal entity in Public-Private Partnership (PPP) mode with participation from all stake holders including Government, service providers, equipment vendors, equipment manufacturers, academic institutes, and research labs.

For more information, please click [here](#)

5.1.3. Trade and Industry Associations

Apart from the government bodies and agencies in the ICT Sector which play an important role in the standards making process. Industry associations play a vital role in lobbying and pursuing industry interest/concern with Government in India. These associations via its members provide the needed lobbying mechanisms to the Indian ministries.

5.1.3.1. Cellular Operators Association of India (COAI)

Over the years COAI has emerged as the official voice for the Indian GSM Industry and interacts directly with Ministries, Policy Makers, Regulators, Financial Institutions and Technical Bodies. It provides a forum for discussion and exchange of ideas between these bodies and Service Providers, who share a common interest in the development of cellular mobile telephony. COAI also collaborates with other Industry Associations such as CII, FICCI, ASSOCHAM, ISPAI, VSAT association etc., with the objective of presenting an industry consensus view to the Government on crucial issues relating to the growth and development of the Indian Cellular Industry.

COAI also interacts with various international organizations such as ITU, GSMA, UMTS, TIA, ITIC, GSA, MMF, Digital Europe, WWRF and 3GPP etc.; Country Embassies as well as the Press & Media to ensure that the issues pertaining to the mobile phone industry are discussed, understood, and debated on a wider platform.

COAI truly brings with its commonality of purpose and achievement of common objectives for the growth and protection of this sector.

For more information, please click [here](#)

5.1.3.2. National Association of Software and Services Companies (NASSCOM)

The National Association of Software and Services Companies (NASSCOM) is a trade association of Indian Information Technology (IT) and Business Process Outsourcing (BPO) industry. Established in 1988, NASSCOM is a non-profit organization. NASSCOM is a global trade body with over 2800 members, of which over 250 are global companies from the US, UK, EU, Japan, and China. NASSCOM's member companies are in the business of software development, software services, software products, IT-enabled/BPO services and e-commerce.

NASSCOM has been a proponent of global free trade in India. NASSCOM is headquartered in New Delhi, India with regional offices in the cities of Mumbai, Chennai, Hyderabad, Bangalore, Pune, and Kolkata.

For more information please [click here](#)

5.1.3.3. Indian Cellular Association (ICA)

Indian Cellular Association (ICA) is the apex body of the mobile industry comprising of Brand Owners; Technology Providers; Manufacturers; National Distributors; Application, Solution and VAS Providers, Ethical Retailers, and eminent Consumers of mobile handsets. The Association has been constituted to provide value and service to the mobile cellular handset industry in India; by fuelling its growth, improving competitiveness, helping create a legal and ethical market and regulatory environment, thereby providing long term benefits of mobile connectivity to the Indian masses.

The Association is headed by its **National President**, who presides over the Association's objectives of ensuring the development of the mobile cellular handset industry in India. ICA, foresees India as a country having a very competitive mobile industry penetrating the entire Indian population, thereby providing voice connectivity and giving tremendous benefits of wireless connectivity to the masses and offering instant wireless solutions to citizens in the areas of.

- Mobile Governance
- Mobile Payments
- Mobile Education
- Mobile Enterprise solutions (including SME Cluster)
- Other walks of life like information, entertainment etc.

For more information please [click here](#)

5.1.3.4. Data Security Council of India (DSCI)

DSCI is a focal body on data protection in India, setup as an independent Self-Regulatory Organization (SRO) by NASSCOM, to promote data protection, develop security and privacy best practices & standards and encourage the Indian industries to implement the same.

DSCI is engaged with the Indian IT/BPO industry, their clients worldwide, Banking and Telecom sectors, industry associations, data protection authorities and other government agencies in different countries. It conducts industry wide surveys and publishes reports, organizes data protection awareness seminars, workshops, projects, interactions and other necessary initiatives for outreach and public advocacy. DSCI is focused on capacity building of Law Enforcement Agencies for combating cyber-crimes in the country and towards this; it operates several Cyber labs across India to train police officers, prosecutors, and judicial officers in cyber forensics.

Public Advocacy, Thought Leadership, Awareness and Outreach and Capacity Building are the key words with which DSCI continues to promote and enhance trust in India as a secure global sourcing hub, and promotes data protection in the country.

For more information please [click here](#)

5.1.3.5. Global ICT Standardization Forum for India (GISFI)

The Global ICT Standardization Forum for India (GISFI) is an Indian standardization body active around Information and Communication Technologies (ICT) and related application areas, such as energy, telemedicine, wireless robotics, biotechnology.

GISFI addresses the research and product development of ICT in India and provides a bridge towards the globalization of the Indian achievements; the issues of technology, governance, and development; and a platform for raising an awareness of the importance and the internationalization of the higher education in the field are supported by the partnership with the Government of India. The working groups organized in GISFI draw knowledge from academia, business, civil society, and Government/policy-making circles.

For more information please [click](#)

5.1.3.6. Broadband India Forum

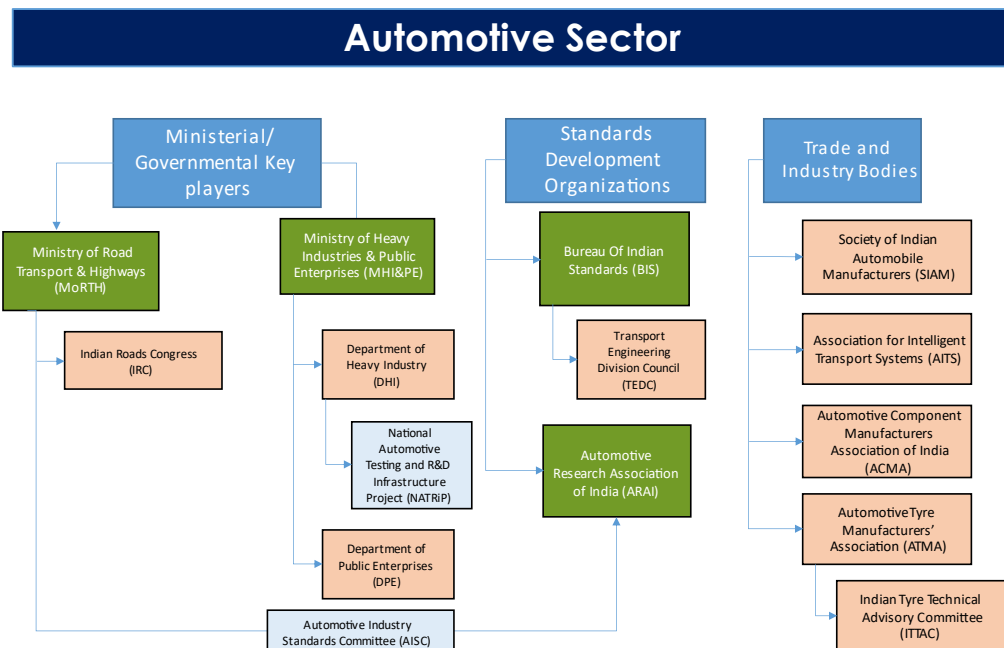
Broadband India Forum (BIF) functions as an independent policy forum and think-tank that works for the development & enhancement of the entire broadband ecosystem in a holistic, technology-neutral, and service-neutral manner. BIF's endeavour is to promote, support and enhance all policy, regulatory & standards initiatives for the proliferation of high-quality broadband in the country to empower consumers with efficient and economical broadband to realize the true Digital India.

BIF works closely with the Government and the Regulator in this mission and is dedicated forum with participation from all stakeholders, including Technology Providers, Telecom Operators, Internet Service Providers, Value-Added Service Providers, Satellite Operators and service providers, MSOs, Start-ups, and professional entities, as well as seasoned Industry professionals who are familiar with different technologies, operations, regulations, and policies.

For more information, please [click here>>](#)

5.2. Automotive

The **automotive sector in India** is the fourth largest in the world. The Ministerial / governmental key players in India in the automotive sector are covered in the following section.



5.2.1. Government

5.2.1.1. Ministry of Road Transport and Highway

An apex organisation under the Central Government, is entrusted with the task of formulating and administering, in consultation with other Central Ministries/Departments, State Governments/UT Administrations, organisations and individuals, policies for Road Transport, National Highways and Transport Research with a view to increasing the mobility and efficiency of the road transport system in the country. The Ministry has two wings: Roads wing and Transport wing.

Road Wing: Deals with development and maintenance of National Highway in the country

Main Responsibilities:

- Planning, development, and maintenance of National Highways in the country.
- Extends technical and financial support to State Governments for the development of state roads and the roads of inter-state connectivity and economic importance.
- Evolves standard specifications for roads and bridges in the country.
- Serves as a repository of technical knowledge on roads and bridges.

Transport Wing: Deals with matter relating to Road Transport.

Main Responsibilities:

- Motor Vehicle legislation.
- Administration of the Motor Vehicles Act, 1988.
- Taxation of motor vehicles.
- Compulsory insurance of motor vehicles.

- Administration of the Road Transport Corporations Act, 1950.
- And promotion of Transport co-operatives in the field of motor transport.
- Evolves road safety standards in the form of a National Policy on Road Safety and by preparing and implementing the Annual Road Safety Plan.
- Collects, compiles and analyses road accident statistics and takes steps for developing a Road Safety Culture in the country by involving the members of public and organising various awareness campaigns.
- Provides grants-in-aid to Non-Governmental Organisations in accordance with the laid down guidelines.

For more information please [click here](#)

MoRTH has following unit:

a) Indian Roads Congress

The Indian Roads Congress (IRC) is the premier technical body of Highway Engineers in the country. The Congress provides a National forum for sharing of knowledge and pooling of experience on the entire range of subjects dealing with the construction & maintenance of roads and bridges, including technology, equipment, research, planning, finance, taxation, organization, and all connected policy issues.

In more specific terms the objectives of the Congress are:

- To promote and encourage the science and practice of building and maintenance of roads.
- To provide a channel for the expression of collective opinion of its members regarding roads.
- To promote the use of standard specifications and to propose specifications.
- To advise regarding education, experiment and research connected with roads.
- To hold periodical meetings, to discuss technical questions regarding roads.
- To suggest legislation for the development, improvement, and protection of roads.
- To suggest improved methods of administration, planning design, construction, operation, use and maintenance of roads.
- To establish, furnish and maintain libraries and museums for furthering the science of road making.
- To publish, or arrange for the publication of proceedings, journals, periodicals, and other literature for the promotion of the objects of the Society.
- To accept subscriptions, subsidies, donations, endowments, and gifts in furtherance of the objects of the Society.
- To invest and deal with the funds of the Society or entrusted to the Society, to acquire and hold any movable or immovable property, and to borrow or raise money for the furtherance of the objects of the Society and to sell, lease, exchange, or otherwise deal with the same.
- To grant pay, prizes, honoraria, or scholarships (including traveling scholarships) for meritorious work in furtherance of the objects of the Society.
- To do all such other lawful things as may be, incidental or conducive to the attainment of the above objects.

IRC have published over 120 number of Codes of Practices for Specifications & Standards: around 110 number of Special Publications on Guidelines and Manuals.

For more information, please [click here](#)

5.2.1.2. Ministry of Heavy Industries & Public Enterprises

The Ministry of Heavy Industries and Public Enterprises, is a Union Ministry under Government of India and comprises of the Department of Heavy Industry and the Department of Public Enterprise. The Ministry focuses on promoting the development and growth of capital goods, auto, power equipment, manufacturing, and engineering industry in the country, framing of policy guidelines for Central Public Sector Enterprise (CPSE).

Under the Ministry, the Department of Heavy Industry is concerned with the development of the engineering industry viz. machine tools, heavy electrical, industrial machinery and auto industry and administers over 30 operating [CPSEs](#).

The Department of Heavy Industry seeks to achieve its vision of global automotive excellence through creation of state-of-the-art Research and Testing infrastructure through the National Automotive Testing and R&D Infrastructure Project (NATRIP). The Department of Heavy Industry seeks to achieve its vision by providing necessary support to the Auto, Heavy Engineering, Heavy Electricals, and Capital Goods Sector.

For more information, please click [here](#)

MHI&PE has following units/projects:

a) National Automotive Testing and R&D Infrastructure Project (NATRIP)

National Automotive Testing and R&D Infrastructure Project (NATRIP) is a fully Government of India funded project with a total project cost of Rs. 3727.30 crore (€465 Million). This is the largest and one of the most significant initiatives in Automotive sector so far. The project aims at creating core global competencies in automotive sector in India by facilitating seamless integration of Indian Automotive industry with the world, through setting up state-of-the-art, four green field automotive testing, homologation and R&D infrastructure facilities and up-gradation of two existing facilities with new technology and equipment. The four new centres that have been setup are:

- 1) International Center for Automotive Technology (iCAT) at Manesar (Haryana) in northern India.
- 2) Global Automotive Research Center (GARC) at Oragadam near Chennai (Tamil Nadu) in southern India.
- 3) National Automotive Test Tracks (NATRAX) at Pithampur near Indore (Madhya Pradesh) in central India.
- 4) National Institute of Automotive Inspection, Maintenance & Training (NIAIMT) at Silchar (Assam) in northeast India.

The two existing facilities 'Automotive Research Association of India (ARAI-Pune) and Vehicle Research & Development Establishment (VRDE - Ahmednagar)' have been upgraded with new technologies.

For more information please [click here](#)

5.2.2. Standards Development Organizations

5.2.2.1. Transport Engineering Division Council (TEDC) of BIS

TEDC of BIS is responsible for standardization in the field of transport engineering including air, water, road and rail transport, diesel engines for stationery application and ISO freight containers, transport packaging etc. Within TEDC, 19 Technical Committees have so far developed [over 1150 Indian Standards](#).

For more information please [click here](#)

5.2.2.2. Automotive Research Association of India (ARAI)

The Automotive Research Association of India (ARAI) has been playing a crucial role in assuring safe, less polluting, and more efficient vehicles. ARAI provides technical expertise in R & D, testing, certification, homologation and framing of vehicle regulations.

ARAI is a co-operative industrial research association established by the automotive industry with the Ministry of Industries and Public Enterprises, Government of India. It works in harmony and complete confidence with its members, customers, and the Government of India to offer the finest services, which earned for itself ISO 9001, ISO 14001, OHSAS 18001 and is also accredited for its testing and calibration scope as per ISO/IEC 17025 by NABL.

Automotive Industry Standards Committee (AISC) is set up under Central Motor Vehicles Rules -Technical Standing Committee (CMVR - TSC) by Ministry of Road Transport & Highways, Dept. of Road Transport & Highways (MoRT&H, DoRT&H)) in the year 1997 to review the safety in the design, construction, operation and maintenance of motor vehicles. The composition of the AISC is as under:

- Ministry of Road Transport & Highways, Department of Road Transport & Highways (MoRT&H, DoRT&H)
- Ministry of Heavy Industries & Public Enterprises, Department of Heavy Industry (MoHI&PE, DHI)
- Ministry of Micro, Small & Medium Enterprises (Office of the Development Commissioner, MSME)
- The Automotive Research Association of India (ARAI)
- Central Institute of Road Transport (CIRT)
- Indian Institute of Petroleum (IIP)
- Vehicle Research and Development Establishment (VRDE)
- Society of Indian Automobile Manufacturers (SIAM)
- Tractor Manufacturers Association (TMA)
- Automotive Component Manufacturers Association of India (ACMA)
- Bureau of Indian Standards (BIS): Technical Committee "Transport Engineering Division Council (TEDC)" for Standardization in the field of transport engineering

ARAI has published over 220 Automotive Industry Standards. The List of Standards published by the AISC can be accessed at [link](#)

India has also signed the 1998 agreement, under which, the country is committed to participate in formulation of Global Technical Regulations. It is important that views of

Indian auto industry as well as test agencies are transmitted with authenticated data to the respective groups under which the discussions take place. To achieve this objective, six mirror groups are formulated in India, which work on various standards under the subject. The 6 GR groups (subsidiary technical bodies of WP.29) are:

- GRPE (India): Working Party on Pollution and Energy
- GRSG (India): Working Party on General Safety Provisions
- GRRF (India): Working Party on Brakes and Running Gear
- GRE (India): Working Party on Lighting and Light-Signalling
- GRB (India): Working Party on Noise
- GRSP (India): Working Party on Passive Safety

The Indian working groups consist of experts from the industry, test agencies and other organizations and deliberate on various subjects / regulations falling within their purview and submit their recommendations to the national secretariat for further actions.

For more information, please [click here](#)

5.2.3. Trade and Industry Associations

5.2.3.1. Society of Indian Automobile Manufacturers (SIAM)

Society of Indian Automobile Manufacturers (SIAM) is the apex Industry body representing 46 leading vehicle and vehicular engine manufacturers in India. SIAM is an important channel of communication for the Automobile Industry with the Government, National and International organizations. The Society works closely with all the concerned stake holders and actively participates in formulation of rules, regulations and policies related to the Automobile Industry. SIAM provides a window to the Indian Automobile industry and aims to enhance exchanges, communication, expand economics, trade and technical cooperation between the Automotive Industry and its international counterparts.

With its regular and continuous interaction with international bodies and organizations it aims to facilitate up gradation of technical capabilities of the Indian Industry to match the best practice worldwide. SIAM has been striving to keep pace with the socio-economic and technological changes shaping the Automobile Industry and endeavour to be a catalyst in the development of a stronger Automobile Industry in India.

For more information please [click here](#)

5.2.3.2. Association for Intelligent Transport Systems (AITS)

Association for Intelligent Transport Systems, India is a registered not-for-profit organization working towards the development and deployment of ITS in India since 2001. AITS, India is a forum that brings Government, Academia, and Industries together to focus on visions set- up by the Government and direct Research and Development for implementing visions in the field of ITS.

AITS along with its members as an essential ITS player contributes to the future of transportation in India, while promoting interests in intelligent transportation systems, in the following areas:

- Vision and strategy
- Research and development
- Partnerships, operational tests
- Deployment of strategic and showcase Projects.
- Innovative procurements
- Public/private partnerships
- Training/education
- Consumer awareness
- Standards development

For more information please [click here](#)

5.2.3.3. Automotive Component Manufacturers Association of India (ACMA)

The Automotive Component Manufacturers Association of India (ACMA) is the nodal agency for the Indian Auto Component Industry. Its active involvement in trade promotion, technology up-gradation, quality enhancement and collection and dissemination of information has made it a vital catalyst for this industry's development. Its other activities include participation in international trade fairs, sending trade delegations overseas and bringing out publications on various subjects related to the automotive industry.

ACMA is represented on several panels, committees and councils of the Government of India through which it helps in the formulation of policies pertaining to the Indian automotive industry. For exchange of information and especially for co-operation in trade matters, ACMA has signed Memorandum of Understanding with its counterparts in Argentina, Australia, Brazil, Canada, Egypt, France, Germany, Hungary, Iran, Italy, Japan, Kazakhstan, Malaysia, Mexico, Nigeria, Pakistan, Poland, Russia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Taiwan, Thailand, Tunisia, Turkey, UK, USA, and Uzbekistan.

ACMA represents over 800 companies, whose production forms most of the total auto component output in the organized sector. In the domestic market, they supply components to vehicle manufacturers, Tier-1 suppliers, to state transport undertakings, Défense establishments, railways and even to the replacement market. A variety of components are being exported to OEMs and aftermarket worldwide.

For more information please [click here](#)

5.2.3.4. Automotive Tyre Manufacturers' Association (ATMA)

Automotive Tyre Manufacturers' Association (ATMA) was set up in 1975, registered under The Companies Act, as the representative body of automotive tyre industry in India. The primary function of the Association is to be a conduit between Government Departments and the tyre companies in having two-way communications. The Association projects the views of the industry on various subjects to respective Government departments. Conversely, the expectations of the Government from tyre industry are conveyed to tyre companies. Further, the Association briefs its members of the changes in Government Policy on issues related to Indian economy and industry in general and tyre industry.

Frequent meetings are held with the Government to sort out problems being faced by the industry.

The Association also has an extensive information bank on the tyre industry which is available for tapping not only for Government but those who are interested in tyre industry related developments. The Association regularly publishes data on production and export of various categories of tyres. Besides, the Association prepares Status notes on various subjects which are of relevance to tyre industry, such as, Tyre Re-treading Industry, Regional Trade Agreements & Rules of Origin, Anti-Dumping, etc.

For more information please [click here](#)

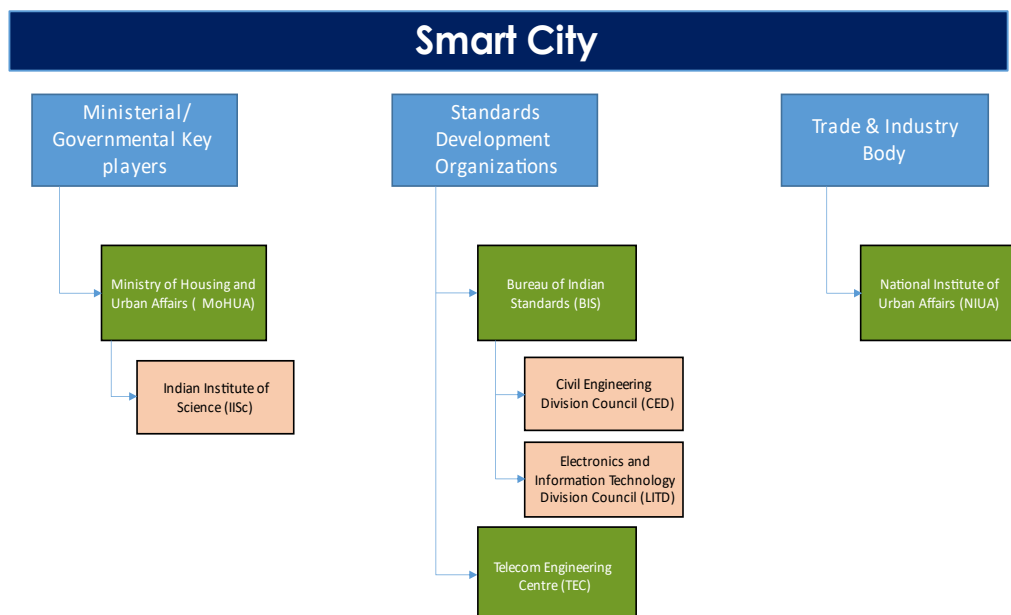
5.2.3.4.1. Indian Tyre Technical Advisory Committee (ITTAC)

ITTAC was established in 1966, by ATMA, Indian Tyre Technical Advisory Committee (ITTAC) is an associated body consisting mainly of technical representatives of ATMA member companies and other tyre companies. ITTAC is essentially a technical Standardization body for the tyre industry.

For more information please [click here](#)

5.3. Smart City

Smart Cities Mission is an urban renewal and retrofitting program by the Government of India with a mission to develop 100 cities all over the country making them citizen friendly and sustainable. The [Ministry of Housing and Urban Affairs](#) is responsible for implementing the mission in collaboration with the state governments of the respective cities. The Government has a vision of developing 100 smart cities as satellite towns of larger cities by modernizing the existing mid-sized cities.



5.3.1. Government

5.3.1.1. Ministry of Housing and Urban Affairs (MoHUA)

In 2017, the Ministry of Housing and Poverty Alleviation, and the Ministry of Urban Development were combined to form the Ministry of Housing and Urban Affairs.

The Ministry of Housing and Urban Affairs formulates policies, coordinates activities of various agencies (at the state and municipal level) and monitors programmes in the area of urban development. It also provides states and urban local bodies (ULBs) with financial assistance through various centrally supported schemes.

For more information, please [click here](#)

5.3.1.1.1. Indian Institute of Science (IISc)

The Ministry of Housing and Urban Affairs (MoHUA) has identified the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore, as the right partner to establish an open-source software platform called Indian Urban Data Exchange (IUDX). The Centre is currently working on the India Urban Data Exchange (IUDX), a standard mechanism to share, discover and access data from IT systems across heterogeneous departments and organizations. IUDX will enable cities to unlock and extract the full potential of the vast amount of data they generate.

For more information, please [click here](#)

5.3.2. Standards Development Organizations

5.3.2.1. Civil Engineering Division Council (CEDC): BIS

The Civil Engineering Division Council (CEDC), of BIS is responsible for preparation of Smart City indicators in India. The work scope of CEDC is as follows: 'Standardization in field of Civil Engineering including structural engineering, building materials and components, planning, design, construction and maintenance of civil engineering structures and built environment, construction practices, safety in building; but excluding those subjects which specifically relate to Water Resources Development and Management'. The Division Council is working towards achieving the above goal through 35 Sectional Committees covering wide range of subjects for basic building materials, design and construction to very high technical areas like Offshore Installations, Ports and Harbours, Cyclone Resistant Structures, etc.

CED has issued the indicators for the proposed 'Smart Cities' to be raised in India. The Document (CED-59) 10,000 WC has been placed in the public domain for eliciting opinion, it had been guided by 'ISO 37120:2014-Sustainable Development of Communities: Indicators for city services and quality of life' while preparing the Standards.

CED-59 has also published a standard **IS 17000: 2019 "Sustainable Development of Habitats – Indicators"**.

For more information please [click here](#)

5.3.2.2. Electronics and Information Technology Division Council (LITD): BIS

LITD 28 of BIS on Smart Infrastructure is responsible for standardization in the field of Smart Cities (Electro-technical and ICT aspects) and related domains including Smart Home/Building and Active assisted living. It is a mirror committee of **IEC TC-SyC SC- (P): Smart Cities** ;**IEC TC-SyC SC- (P): Active Assisted Living** ;**IEC TC-SEG 9 (P): Smart Home/Office Building Systems** ; **ISO/IEC TC-JTC 1 SC-WG 11 (P): Smart Cities** ;**IEC TC-SyC (P): Committee Communication Technologies and Architectures**.

LITD 28 has published following standards:

- [IS 18000: 2020](#) Unified Digital Infrastructure — ICT Reference Architecture (UDI-ICTRA)
- [IS 18010 \(Part 1\): 2020](#) Unified Digital Infrastructure — Unified Last Mile Communication Protocols Stack Part 1 Reference Architecture (UDI – ULMCPS – RA)
- [IS 18003 \(Part 1\): 2020](#) Unified Data Exchange Part 1 Architecture

This technical committee had also prepared a Pre-standardization study report on “Unified, Secure & Resilient ICT Backbone for Smart Cities/Smart Infrastructure. ([Click here to download the report](#)).

Within LITD, 35 Technical Committees have so far developed [over 1650 Indian Standards](#). For more information, please [click here](#)

5.3.2.3. Telecom Engineering Centre (TEC)

Recently, Telecom Engineering Centre (TEC), DoT, has approved TSDSI transposed oneM2M specification Release 2 as a national standard. Adoption of these oneM2M specifications will give a boost to the development of smart cities in India. It will also enable greater collaboration between IoT solution developers which will reduce the time to bring innovation to market.

For more details, please refer to chapter 3.3 of this report or please click [here](#)

5.3.3. Trade and Industry Association

5.3.3.1. National Institute of Urban Affairs

The National Institute of Urban Affairs (NIUA) is an apex body to support and guide the Government of India in its urban development plans. it works closely with the Ministry of Housing and Urban Affairs, alongside other government, and civil sectors, to identify key areas of research, and address the lacunae in urban policy and planning. With a team spanning planners, engineers, researchers, architects and analysts, the Institute provides cross disciplinary expertise and technical assistance for city and state-level projects, as well as developing toolkits and customised training programmes to strengthen the capacity of local and regional, and governing agencies. In its aims of enriching and expanding urban knowledge bases within the country, its work today addresses 5 major thematic concerns:

- Urbanization & Economic Growth
- Urban Governance & Finance
- Urban Infrastructure & Built Environment

- Environment, Climate Change & Resilience
- Social Development

The skills, resources, and deep-rooted knowledge NIUA has accumulated over 40 years of experience in the urban sector also make it the first port of call for international donors and institutions seeking to develop meaningful partnerships in the country. Whilst helping bolster India's urban narrative at the global level, NIUA is also committed to aligning its efforts in accords with the UN Sustainable Development Goals, ensuring that global targets are achieved through locally adapted and integrated urban frameworks.

Key ongoing projects:

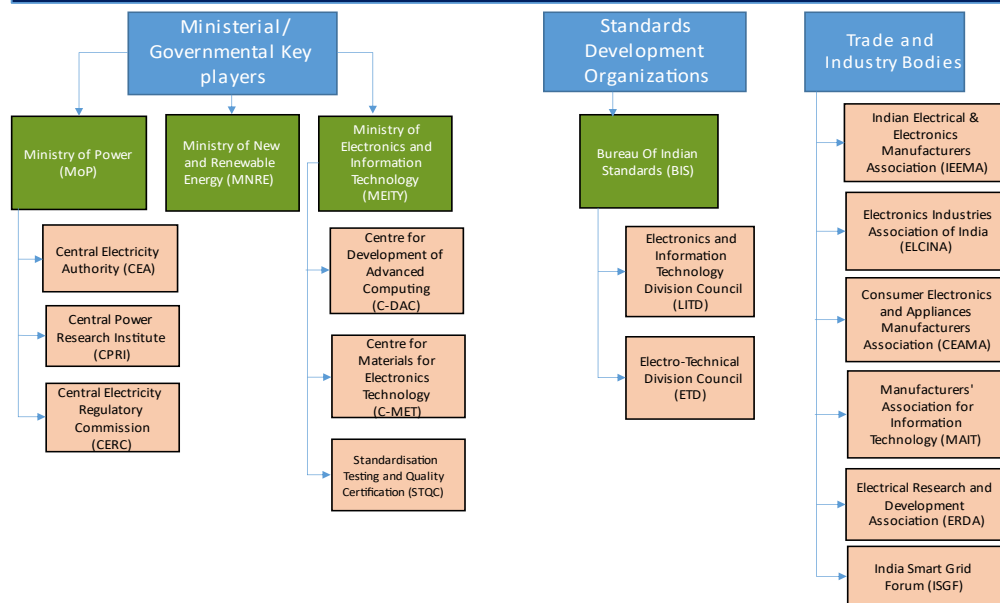
- [Smartnet](#): Smartnet is an initiative of the Ministry of Housing and Urban Affairs to support the development of cities across India by creating a resource-rich ecosystem of learning, sharing, knowledge dissemination and solutions exchange for city managers and primary stakeholders in the urban transformation of India.
- [Climate Smart Cities](#): The objective of Climate Smart Cities is to anchor climate-friendly solutions for urban infrastructure projects and area-based development in the planning and implementation of projects under the Smart Cities Programme of the Government of India. It focuses on supporting cities through various instruments (technical handholding, training, peer learning) in implementing smart solutions and by that contributing to climate change mitigation and adaptation.
- [Climate Centre for Cities](#): This Centre aims to achieve that by creating a one stop shop for climate informed urban development actions facilitated by multi-stakeholder collaborations with a Vision to Build Climate Action in Cities through 1. P4 Support (Policy + Planning + Program + Project) 2. Research and Knowledge Management 3. Innovation 4. Capacity Building 5. Advocacy and communication 6. Partnerships
- [Sustainable Cities Integrated Approach Pilot in India](#): "Sustainable Cities Integrated Approach Pilot in India" is one of the Child projects under GEF's Sustainable Cities Programme in the GEF 6 cycle. The participating cities include Bhopal, Jaipur, Mysuru, and Vijayawada-Guntur. The aim of the project is to integrate sustainability strategies into urban planning and management to create a favorable environment for investment in infrastructure and service delivery, thus building the resilience of pilot cities.

For more information about NIUA, please [click here](#)

5.4. Electrical Equipment including Consumer Electronics

The Ministerial / governmental key players in India in the Electrical Equipment including Consumer Electronics sector are covered in the following section.

Electrical Equipment including Consumer Electronics



5.4.1. Government

5.4.1.1. Ministry of Power

The [Ministry of Power](#) started functioning independently with effect from 2nd July, 1992. Earlier it was known as the Ministry of Energy sources. The Ministry of Power is primarily responsible for the development of electrical energy in the country. The Ministry is concerned with perspective planning, policy formulation, processing of projects for investment decision, monitoring of the implementation of power projects, training and manpower development and the administration and enactment of legislation in regard to thermal, hydro power generation, transmission and distribution. The Ministry of Power is responsible for the Administration of the Electricity Act, 2003, the Energy Conservation Act, 2001 and to undertake such amendments to these Acts, as may be necessary from time to time, in conformity with the Government's policy objectives.

For more information please [click here](#)

MoP has following units:

a) Central Electricity Authority - Ministry of Power

The [Central Electricity Authority \(CEA\)](#) is a statutory organization and established as a part-time body in the year 1951 and made a full-time body in the year 1975. With the objective of reforming the Power Sector, the Electricity Act, 2003 has been enacted and the provisions of this Act have been brought into force with effect from 10th June, 2003. As per section 73 of the Electricity Act, 2003, the functions and duties of CEA includes following:

- Advise the Central Government on the matters relating to the national electricity policy, formulate short-term and perspective plans for development of the electricity system and coordinate the activities of the planning agencies for the optimal

utilization of resources to sub serve the interests of the national economy and to provide reliable and affordable electricity to all consumers.

- Specify the technical standards for construction of electrical plants, electric lines and connectivity to the grid.
- Specify the safety requirements for construction, operation and maintenance of electrical plants and electric lines.
- Specify the Grid Standards for operation and maintenance of transmission lines.

For more information please [click here](#)

b) Central Power Research Institute (CPRI)

CPRI is the powerhouse of the Indian electrical industry. Set up in 1960 by the Government of India, it functions as a centre for applied research in electrical power engineering assisting the electrical industry in product development and quality assurance. CPRI also serves as an independent authority for testing and certification of power equipment. With its state-of-the art infrastructure and expertise, CPRI has made significant contributions to the power sector in the country for improved planning, operation, and control of power systems. Besides in-house R&D, CPRI also undertakes sponsored research projects from manufacturers and other agencies in different areas of specialization. With its quality of output on par with International standards CPRI offers specialized services on the performance, evaluation, and certification of different kinds of power equipment like Switchgear, Fuse Gears, Transformers, Cables, Capacitors, Insulating Materials and Systems, Transmission Line Towers, Liquid Dielectrics and Non-Conventional Energy Devices in its seven laboratories spread all over India.

For more information please [click here](#)

c) Central Electricity Regulatory Commission (CERC)

The Commission intends to promote competition, efficiency, and economy in bulk power markets, improve the quality of supply, promote investments and advise government on the removal of institutional barriers to bridge the demand supply gap and thus foster the interests of consumers. In pursuit of these objectives the Commission aims to –

- Improve the operations and management of the regional transmission systems through Indian Electricity Grid Code (IEGC), Availability Based Tariff (ABT), etc.
- Formulate an efficient tariff setting mechanism, which ensures speedy and time bound disposal of tariff petitions, promotes competition, economy, and efficiency in the pricing of bulk power and transmission services and ensures least cost investments.
- Facilitate open access in inter-state transmission.
- Facilitate inter-state trading.
- Promote development of power market.
- Improve access to information for all stakeholders.
- Facilitate technological and institutional changes required for the development of competitive markets in bulk power and transmission services.
- Advise on the removal of barriers to entry and exit for capital and management, within the limits of environmental, safety and security concerns and the existing legislative requirements, as the first step to the creation of competitive markets.

For more information please [click here](#)

5.4.1.2. Ministry of New and Renewable Energy (MNRE)

The [Ministry of New and Renewable Energy \(MNRE\)](#) is the nodal Ministry of the Government of India for all matters relating to new and renewable energy. The broad aim of the Ministry is to develop and deploy new and renewable energy for supplementing the energy requirements of the country.

MNRE facilitates research, design, development, manufacture, and deployment of new and renewable energy systems/devices for transportation, portable and stationary applications in rural, urban, industrial, and commercial sectors through:

- Technology Mapping and Benchmarking
- Identify Research, Design, Development and Manufacture thrust areas and facilitate the same.
- Lay down standards, specifications, and performance parameters at par with international levels and facilitate industry in attaining the same.
- Align costs of new and renewable energy products and services with international levels and facilitate industry in attaining the same.
- Appropriate international level quality assurance accreditation and facilitate industry in obtaining the same.
- Provide sustained feedback to manufacturers on performance parameters of new and renewable energy products and services with the aim of effecting continuous upgrade to attain international levels in the shortest possible time span.
- Facilitate industry in becoming internationally competitive and a net foreign exchange earner
- Resource Survey, Assessment, Mapping and Dissemination
- Identify areas in which new and renewable energy products and services need to be deployed in keeping with the goal of national energy security and energy independence.
- Resource Survey, Assessment, Mapping and Dissemination.
- Deployment strategy for various indigenously developed and manufactured new and renewable energy products and services.
- Provision of cost-competitive new and renewable energy supply options

[Renewable Energy Standardization cell in MNRE:](#)

In January 2020, BIS requested the Ministry to set up a standardization cell in the MNRE as part of their Standards National Action Plan (SNAP). Accordingly, the ministry has decided to set up a Renewable Energy Standardization Cell (RESC). The objectives of the cell are:

- to identify the areas in renewable energy where standards need to be developed/updated/adopted.
- Identify and peruse international standards such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) for applications in Indian climatic conditions. In case of any modifications, they should be first done and tried in test laboratories for revision suitable for the country's climatic conditions.
- Initiate the process of developing standards involving experts from research and development (R&D) institutions, test labs, and industry.

For more information about MNRE, please [click here](#)

5.4.1.3. Ministry of Electronics and Information Technology (MEITY)

As mentioned above in chapter 5.1.1 (see 5.1.1.2) Meity was carved out of the Ministry of Communications and Information Technology on 19 July 2016 as a standalone ministerial agency responsible for IT policy, strategy, and development of the electronics industry. Among other functions, MEITY is responsible for Policy matters relating Electronics, Matters relating to promotion and manufacturing of Semiconductor Devices in the country excluding all matters relating to Semiconductor Complex Limited (SCL), Mohali; Electronics Export and Computer Software Promotion Council (ESC) etc.

Key units:

a) Centre for Development of Advanced Computing (C-DAC)

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Ministry of Electronics and Information Technology (MeitY) for carrying out R&D in IT, Electronics, and associated areas. Different areas of C-DAC had originated at different times, many of which came out as a result of identification of opportunities.

- The setting up of C-DAC in 1988 itself was to build Supercomputers in context of denial of import of Supercomputers by USA. Since then, C-DAC has been undertaking building of multiple generations of Supercomputer starting from PARAM with 1 GF in 1988.
- Almost at the same time, C-DAC started building Indian Language Computing Solutions with setting up of GIST group (Graphics and Intelligence based Script Technology); National Centre for Software Technology (NCST) set up in 1985 had also initiated work in Indian Language Computing around the same period.
- Electronic Research and Development Centre of India (ER&DCI) with various constituents starting as adjunct entities of various State Electronic Corporations, had been brought under the hold of Department of Electronics and Telecommunications (now MeitY) in around 1988. They were focusing on various aspects of applied electronics, technology, and applications.
- With the passage of time as a result of creative ecosystem that got set up in C-DAC, more areas such as Health Informatics, etc., got created; while right from the beginning the focus of NCST was on Software Technologies; similarly, C-DAC started its education & training activities in 1994 as a spin-off with the passage of time, it grew to a large efforts to meet the growing needs of Indian Industry for finishing schools.

For more information on CDAC please click [here](#)

b) Centre for Materials for Electronics Technology (C-MET)

C-MET has been set up as a Registered Scientific Society in March 1990 under Ministry of Electronics and Information Technology (MEITY) as a unique concept for development of viable technologies around materials mainly for electronics. C-MET is operating with 3 laboratories located at Pune (Head Quarters), Hyderabad and Thrissur with specialized research mandate at each place. The mission of C-MET is to develop knowledge base in the electronic materials and their processing technology and become a source of critical electronic materials, know-how and technical services for the industry and other sectors of the economy.

Core Programmes of C-MET are:

- Integrated Electronics Packaging
- Nanomaterials and Devices
- Ultra-High Purity Materials
- Materials for Renewable Energy
- Piezo Sensors and Actuators

For more information on C-MET please click [here](#)

c) Standardization Testing and Quality Certification (STQC)

Standardisation Testing and Quality Certification (STQC) Directorate is an attached office of the MeitY, India, provides quality assurance services around Electronics and IT through countrywide network of laboratories and centres. The services include [Testing](#), [Calibration](#), [IT & e-Governance](#), [Training](#) and [Certification](#) to public and private organizations.

STQC laboratories are having National / International accreditation and recognitions around testing and calibration.

For more details, please [click here](#)

5.4.2. Standards Development Organization

5.4.2.1. Electro-technical Division Council (ETD): BIS

Standardization in the field of electrical power generation, transmission, distribution, and utilization equipment; and insulating materials, winding wires, measuring and process control instruments and primary and secondary batteries. Within ETDC, 45 Technical Committees have so far developed over 1750 Indian Standards.

For more information please [click here](#)

5.4.2.2. Electronics and Information Technology Division Council (LITD): BIS

Electronics and Information Technology Division Council (LITDC): Standardization in the field of electronics and telecommunications including Information Technology. Within LITDC, 35 Technical Committees have so far developed over 1750 Indian Standards.

For more information please [click here](#)

5.4.3. Trade and Industry Associations

5.4.3.1. Indian Electrical & Electronics Manufacturers' Association (IEEMA)

IEEMA is the national representative organisation of manufacturers of electrical, industrial electronics and allied equipment. Indian Electrical & Electronics Manufacturers' Association (IEEMA) is the apex association of manufacturers of electrical, industrial electronics and allied equipment in India.

With expertise resident in its product divisions and cells, IEEMA is the natural voice of Indian electrical industry and plays a crucial policy advocacy role with the government and its agencies. IEEMA facilitates a robust two-way flow of customised and value-added information between the government and the industry. It sensitizes all stakeholders on the future requirements for development of the power sector in the country. IEEMA also engages proactively in government-industry consultative mechanism through its representation on councils and committees constituted by the government and its agencies in policy, strategic and other matters.

IEEMA works closely with government agencies, utilities, standardisation bodies, research & development organisations and testing institutes for formulating Indian standards for electro-technical industry and developing energy efficient products.

For more information please [click here](#)

5.4.3.2. Consumer Electronics and Appliances Manufacturers Association (CEAMA)

Electronics and Appliances Manufacturers Association is an all-India organization in the Consumer Electronics and Durables sector. It has been in existence for over 32 years. Presently, there are about 100 members. It is the voice of Consumer Electronics and Durables sector to.

- Interacts with the Government in formulating policies for the development of the sector.
- Facilitate industry growth, by serving as an interface with the Government for meaningful interaction and dialogue.
- Conduct Training Programs and Workshops and Organize Seminars, Conferences and Exhibitions.
- Interact with other industry Chambers / Associations.

For more information please [click here](#)

5.4.3.3. Electronic Industries Association of India (ELCINA)

ELCINA Electronic Industries Association of India (Formerly Electronic Component Industries Association) was established in 1967 when India's Electronics industry was still in its infancy. Since then, ELCINA has been well known as an interactive forum for electronics and IT manufacturers. Apart from the basic objective of promoting hardware manufacturing through active representation and advice to the Government, ELCINA has been networking with national and international technical institutions and business promotion bodies to further the interests of its members. Today, in an increasingly liberalized environment, there is greater focus on professional and value-added services rendered by the Association to the Electronics and IT Community.

As India's oldest and largest electronics Association, ELCINA has always remained committed to the promotion of electronics manufacturing culture in the country, focusing on components - the building blocks of electronics industry. **ELCINA, now renamed as ELCINA Electronic Industries Association of India**, has widened its horizons, and broadened its activities to include the development of entire Electronics and IT Hardware, including components & assemblies, consumer electronics, telecom, IT,

industrial/professional, defense/strategic electronics and other emerging areas like medical and automobile electronics, embedded systems and hardware design. ELCINA continues to work towards correlating the common interest of electronic hardware manufacturers with that of manufacturers of electronic materials, machinery and service providers, for accelerating growth.

For more information please [click here](#)

5.4.3.4. Manufacturers' Association for Information Technology (MAIT)

Set up in 1982 for purposes of scientific, educational and IT Industry promotion, **MAIT** has emerged as an effective, influential, and dynamic organization in these 30 years. Representing Hardware, Training, R&D & Hardware Design and other associated service segments of the Indian IT Industry, **MAIT's** charter is to develop a globally competitive Indian IT Industry, promote the usage of IT in India, strengthen the role of IT in national economic development, promote business through international alliances, promote quality consciousness in the IT Industry and transform the Indian IT Industry into a World Scale Industry leading to a World Class Usage and thus a World Size Market.

MAIT is represented on all concerned Government of India forums and works in close association with the Department of Electronics & IT, Department of Telecom, Ministry of Communications & IT, Ministry of Commerce & Industry, Ministry of Environment & Forests, DGFT, DGS&D, DIPPI, NMCC, Ministry of MSME, Ministry of Finance, Planning Commission, UIDAI, Directorate of Income Tax (Systems), RGI, DARPG, BEE, BIS, NPC, CPCB, ESC, NIC, STQC, CII, FICCI, ASSOCHAM, TEMA, ISA, ICA, ELCINA, CEAMA, etc. for the advancement of the IT Industry in India. **MAIT** is driving the eco-system of the Indian IT hardware manufacturing industry in the country. The primary agenda for the Association is to:

- Build the demand for ICT and evolve the e-Inclusion objective of the government; and
- Build a globally competitive, environmentally sound, ethically healthy and best-in-class IT industry eco-system.

For more information please [click here](#)

5.4.3.5. Electrical Research and Development Association (ERDA)

Electrical Research and Development Association (**ERDA**) is a cooperative research institution created by the Indian Electrical Industry and Utilities with the support of Governments of India and Gujarat. National in character, ERDA has established its laboratory facilities at Makarpura Industrial Estate, Vadodara, Gujarat. The Laboratories stand in a sprawling 25-acre plot donated by the Government of Gujarat. ERDA is a professionally managed not-for-profit technical organization serving the industries and utilities since 1974 in the areas of test, evaluation, certification, consultancy, and R&D related to electrical products and systems. ERDA is managed by a Managing Committee consisting of elected and nominated members from industries, utilities, Council of Scientific and Industrial Research – Government of India, Government of Gujarat, and eminent invited experts.

For more information please [click here](#)

5.4.3.6. India Smart Grid Forum (ISGF)

India Smart Grid Forum (ISGF) registered under Indian Societies Registration Act (Act XXI of 1860) is a Public Private Partnership (PPP) initiative of Ministry of Power, Government of India for accelerated development of Smart Grid technologies in the Indian power sector.

The main objectives of ISGF are:

- To help the Indian power sector deploy smart grid technologies in an efficient, cost effective, innovative, and scalable manner by bringing together all key stakeholders and enabling technologies.
- To create a platform for public and private stakeholder members, research institutions and power utilities to exchange ideas and information on smart grids and develop use case scenarios for India.
- To bring together experts from regulation, policy, and the corporate sector to build support for smart grid policies.
- To conduct research on the capabilities of smart grids in the Indian context through case studies, cost-benefit analysis, study of technical advancements in renewable energy sources and other ancillary activities.
- To make recommendations to the Government, Regulators, Utilities and Consumers through reports, white papers, technical seminars, etc.

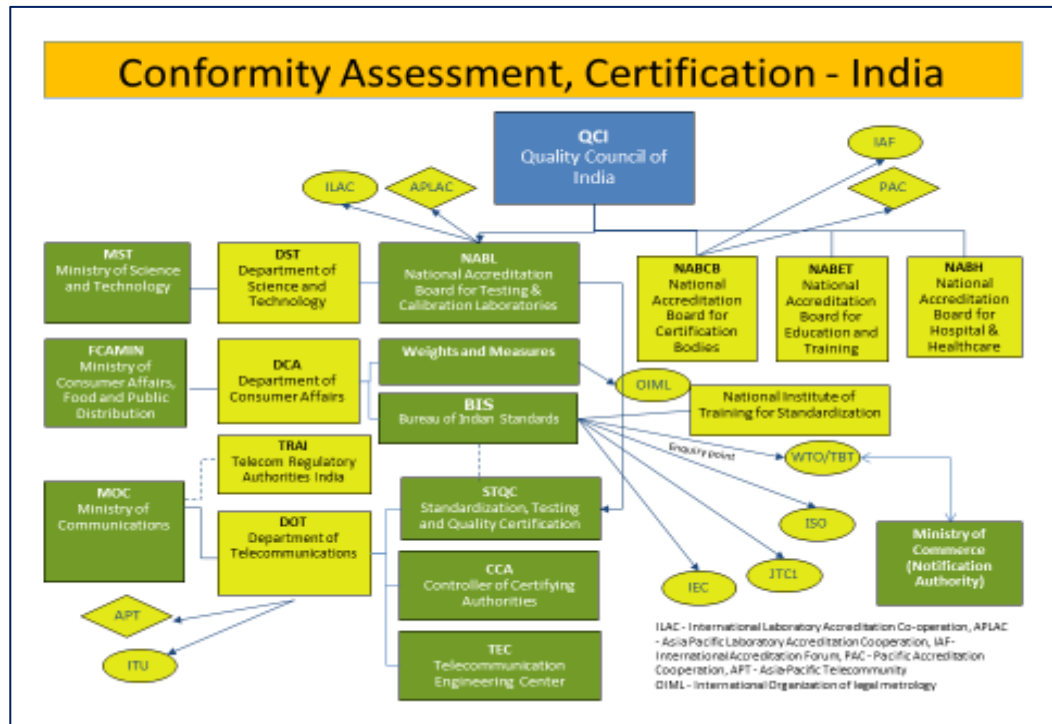
ISGF has 8 working groups focussed on different aspects of smart grid such as:

- WG1: Grid Modernization & Smart Cities.
- WG2: IoT, Smart Metering, AI & Analytics.
- WG3: Digital Architecture and Cyber Security.
- WG4: Policy, Regulations and Business Models.
- WG5: Renewables & Microgrids.
- WG6: Flexibility & Electric Mobility.
- WG7: Smart Gas.
- WG8: Smart Water.

For more information please [click here](#)

6. Accreditation, Testing and Certification

In India, unlike Europe, there is very little, if any, market-surveillance, almost no product liability court cases and it is common to find non-conformant inferior quality products. Official sanctions are minimal and very time consuming and so most consumers do not even report non-conformance. This has resulted in consumers and entities relying on (company) branded products which guarantee quality and/or government approved certifications and logos such as ISI Mark, Gold hallmarking which provide the necessary trust. The only entities which do have power to impose sanctions, confiscate products, etc. are the Indian export councils which provide the guarantees. Thus, it is common to see local products being promoted as “Export Quality” since products for exports from India are monitored and certified by the certification bodies.



Due to inherent lack of trust in general, the European model of Self-Declaration-of-Conformity (SDoC) to standards/norms does not work in India. This is a major difference for EEA entities wishing to export to India since the Indian Government may require additional certifications since SDoC are not regarded as trust worthy.

6.1. Quality Council of India (QCI)

Quality Council of India (QCI) was set up jointly by the Government of India and the Indian Industry represented by the three premier industry associations i.e., Associated Chambers of Commerce and Industry of India (ASSOCHAM), Confederation of Indian Industry (CII) and Federation of Indian Chambers of Commerce and Industry (FICCI), to establish and operate national accreditation structure and promote quality through National Quality Campaign. QCI is registered as a non-profit society with its own Memorandum of Association. QCI is governed by a Council of [38 members](#) with equal representations of government, industry, and consumers. Chairman of QCI is appointed by the Prime Minister on recommendation of the industry to the government.

In addition, it has an exclusive Board for promotion of Quality. QCI through the executive boards in the specific areas i.e., Accreditation for.

- National Accreditation Board for Certification Bodies (NABCB - <http://qcini.org/nabcb/>): It undertakes assessment of Certification Bodies applying for accreditation as per the Board's criteria in line with international standards and guidelines. It offers Accreditations for
 - o Quality Management Systems (QMS)
 - o Environmental Management Systems (EMS)
 - o Food Safety Management Systems
 - o Inspection
 - o Product Certification
 - o Occupational Health and Safety Management Systems

- Information Security Management

List of Name and Address of NABCB Accredited Certification / Inspection Bodies is available [here](#)

- NABL is an accreditation body, with its accreditation system established in accordance with ISO/ IEC 17011. ‘Conformity Assessment –Requirements for Accreditation bodies accrediting conformity assessment bodies. NABL provides voluntary accreditation services to:
 - Testing laboratories in accordance with ISO/ IEC 17025 ‘General Requirements for the Competence of Testing and Calibration Laboratories’
 - Calibration laboratories in accordance with ISO/ IEC 17025 ‘General Requirements for the Competence of Testing and Calibration Laboratories’
 - Medical testing laboratories in accordance with ISO 15189 ‘Medical laboratories -Requirements for quality and competence’
 - Proficiency Testing Providers (PTP) in accordance with ISO/IEC 17043 “Conformity assessment — General requirements for proficiency testing” and
 - Reference material producers (RMP) in accordance with ISO 17034 “General requirements for the competence of reference material producers”.

NABL is Mutual Recognition Arrangements (MRA) signatory to ILAC as well as APAC for the accreditation of Testing and Calibration Laboratories (ISO/IEC 17025), Medical Testing Laboratories (ISO 15189) and Proficiency Testing Providers (PTP) (ISO/IEC 17043). NABL is also signatory to APAC MRA for accreditation of Reference materials producers (RMP). ([Click Here](#))

- National Accreditation Board for Education and Training (NABET - <http://qcin.org/nabet/>)
- National Accreditation Board for Hospitals and Healthcare Providers “NABH - <http://www.nabh.co/>

This means that products from EEA area may have to go through additional certification by QCI accredited body since SDoC or certification from non-accredited entity may not be accepted, unless there is an MLA.

6.2. Standardization Testing and Quality Certification (STQC)

Standardisation Testing and Quality Certification (STQC) Directorate is an attached office of the Meity, India, provides quality assurance services around Electronics and IT through countrywide network of laboratories and centres. The services include [Testing](#), [Calibration](#), [IT & e-Governance](#), [Training](#) and [Certification](#) to public and private organizations.

STQC laboratories are having National / International accreditation and recognitions around testing and calibration.

Besides testing and calibration STQC has specialized institutions such as Indian Institute of Quality Management (IIQM) for quality related training programs and Centre for Reliability (CFR) for reliability related services.

In the area of IT & e-Governance, STQC provides Quality Assurance Services for Software testing, Information Security, and IT Service Management by conducting Testing, Training, Audit and Certifications.

STQC is responsible for maintaining eGov standards. Based on this concept a Conformity Assessment Framework (CAF) for e-Governance project has also been developed and is in operation. Two IT test laboratories, at Bangalore and Kolkata, have received accreditation from American Association for Laboratory Accreditation (A2LA) being the first outside the USA. STQC Certification Services are accredited and recognized by:

- Dutch Council for Accreditation (Raad vor Accreditate, RvA), Netherlands for
- ISO 9001 - Quality Management System (QMS)
- ISO 27001 - Information Security Management System (ISMS)
- ISO 20000 – IT Service Management (ITSM)
- Product Safety Certification Scheme based on IEC standards.
- National Accreditation Board for Certification Bodies (NABCB), India for ISO 9001 - Quality Management System

Both Raad vor Accreditate (RvA), Netherlands and NABCB, India are signatory of Multilateral Recognition Arrangement (MLA) of International Accreditation Forum (IAF) Inc., the RvA / NABCB accredited certificates issued by STQC Certification Services are valid worldwide. STQC's international recognition has also been enhanced by virtue of its mutual recognition agreements with leading certification agencies across the world such as BSI, UK; TUV, Germany; JQA, Japan; Kaitech, S.Korea; CEPREL, China; KEMA, Netherlands etc. Organizations can also obtain EQNET certificate acceptable in all over the European Union.

STQC Certification Services took lead and became the first Third Party Certification Agency of Indian origin in India in 1991 to offer QMS certification. Since then, STQC Certification Services has broaden its scope of certification and is now providing Certification Service in QMS Product Certification/ISMS/ITSM/Website quality / smart card / Biometric devices along with a host of other schemes for the benefit of the industry. It caters to the need of third-party certification for the products in line with National and International standards and schemes. STQC offers its certification services to industry and other organizations in the following domains:

- **Management System Certification Schemes**
 - o [ISO 9001 Quality Management System \(QMS\) Certification](#)
- **Product Certification Schemes**
 - o [Product Safety Certification based on IEC Standards \(S mark\)](#)
 - o [IECEE-CB Certification Based on IEC Standards](#)
 - o [Agency Inspection Services](#)
- **Mgmt. System, Product Certification (IT & e-Gov)**
 - o [ISO 27001 Information Security Management System \(ISMS\) Certification](#)
 - o [ISO 20000-1 IT Service Management \(ITSM\) Certification](#)
 - o [Website Quality Certification](#)
 - o [Common Criteria Certification](#)
 - o [Smart Card Testing and Certification](#)
 - o [Bio-metric Devices Testing and Certification](#)
 - o [Software & System Certification](#)

For more information about STQC, please [click here](#)

6.3. Controller of Certifying Authorities (CCA)

As per Section 18 of The Information Technology Act, 2000 provides the required legal sanctity to the digital signatures based on asymmetric cryptosystems. The digital signatures are now accepted at par with handwritten signatures and the electronic documents that have been digitally signed are treated at par with paper documents. The IT Act provides for the Controller of Certifying Authorities (CCA) to license and regulate the working of Certifying Authorities. The Certifying Authorities (CAs) issue digital signature certificates for electronic authentication of users.

The Controller of Certifying Authorities (CCA) has been appointed by the Central Government under section 17 of the Act for purposes of the IT Act. The Office of the CCA came into existence on November 1, 2000. It aims at promoting the growth of E-Commerce and E- Governance through the wide use of digital signatures.

The Controller of Certifying Authorities (CCA) has established the Root Certifying Authority (RCAI) of India under section 18(b) of the IT Act to digitally sign the public keys of Certifying Authorities (CA) in the country. The RCAI is operated as per the standards laid down under the Act.

The CCA certifies the public keys of CAs using its own private key, which enables users in the cyberspace to verify that a given certificate is issued by a licensed CA. For this purpose, it operates, the Root Certifying Authority of India (RCAI). The CCA also maintains the Repository of Digital Certificates, which contains all the certificates issued to the CAs in the country.

For more information please [click here](#)

6.4. Export Promotion Councils of India (EPC)

The Export Promotion Councils are non-profit organizations registered under the Indian Companies Act or the Societies Registration Act, as the case may be. They are supported by financial assistance from the Government of India.

The major functions of the EPCs are as follows:

- To provide commercially useful information and assistance to their members in developing and increasing their exports
- To offer professional advice to their members in areas such as technology upgradation, quality and design improvement, standards and specifications, product development and innovation etc.
- To organize visits of delegations of its members abroad to explore overseas market opportunities.
- To organize participation in trade fairs, exhibitions and buyer-seller meets in India and abroad.
- To promote interaction between the exporting community and the Government both at the Central and State levels.
- To build a statistical base and provide data on the exports and imports of the country, exports, and imports of their members, as well as other relevant international trade data.

Presently, there are fifteen Export Promotion Councils under the administrative control of the Department of Commerce and there are Eleven Export promotion councils under the Ministry of Textiles. The Councils perform both advisory and executive functions.

For more information please [click here>>](#)

6.5. Export Inspection Council of India (EIC)

The Export Inspection Council (EIC) is the official export –certification body of India which ensures quality and safety of products exported from India. EIC was set up by the Government of India under Section 3 of the Export (Quality Control and Inspection) Act, 1963 to ensure sound development of export trade of India through quality control and inspection and matters connected therewith. The role of EIC is to ensure that products notified under the Export (Quality Control and Inspection) Act 1963 are meeting the requirements of the importing countries in respect of their quality and safety.

EIC is an advisory body to the Central Government, which is empowered under the Act to:

- Notify commodities which will be subject to quality control and/ or inspection prior to export,
- Establish standards of quality for such notified commodities, and
- Specify the type of quality control and / or inspection to be applied to such commodities.

Besides its advisory role, the Export Inspection Council, also exercises technical and administrative control over the five Export Inspection Agencies (EIAs), one each at Chennai, Delhi, Kochi, Kolkata, and Mumbai established by the Ministry of Commerce, Government of India, under Section 7 of the Act for the purpose of implementing the various measures and policies formulated by the Export Inspection Council of India.

Export Inspection Council, either directly or through Export Inspection Agencies, and its field organization renders services in the areas of:

- Certification of quality of export commodities through installation of quality assurance systems (In-process Quality Control and Self Certification) in the exporting units as well as consignment wise inspection.
- Certification of quality of food items for export through installation of Food safety Management System in the food processing units.
- Issue of Certificates of origin to exporters under various preferential tariff schemes for export products.

For more information please [click here](#)

7. Other Indian Organization involved in Standard Development.

In India, there are many other industries and professional bodies which formulate sector specific standards, which may be referred as Standards Developing Organizations (SDOs). The statutory provisions given under Section 10 (2) (c) of the BIS Act 2016 and Section 30 of the BIS Rules, 2018 confer upon BIS, powers to recognize any Standards Developing Organization in India for development of standards.

Indian voluntary Standards development organizations	
Organization	Standard Published
Agricultural and Processed Food Products Export Development Authority (APEDA)	Standards for organic production and Systems (under the National programme for Organic Production - NPOP)
Bureau of Energy Efficiency (BEE)	Energy performance Standards for Appliances Energy Conservation Building Code
Central Drugs Standard Control Organization (CDSCO)	Lay down the standards for Drugs and health care devices / technologies, approve new drugs under the Drugs and Cosmetics Act.
Central Pollution Control Board (CPCB)	Lays down standards for the quality of air, water quality criteria from different sources, emission norms for vehicles, emission norms & sound levels for diesel engines & generator sets. CPCB also prepares manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks, and ducts.
Directorate of Marketing and Inspection (DMI)- AGMARK	Grading Standards covering 164 commodities in the following categories Pulses, Cereals, Essential Oils, Makhana, Vegetable Oils, Fruits & Vegetables Roasted Bengal Gram, and Vermicelli, Macaroni & Spaghetti
Export Inspection Council of India (EIC)	EIC itself does not formulate any standard and instead recognizes the technical regulations or national standards of the importing countries /international standards provided that such specifications are not below the minimum standard specification prescribed in the order/notification issued by Govt. of India for the product.
Food Safety and Standards Authority of India (FSSAI)	Lay down standards for articles of food and regulate their manufacture, storage, distribution, sale, and import. General standards that apply to all foods as well as over 300 product standards are available on FSSAI website and constantly being revised/amended.
Marine Products Export Development Authority (MPEDA)	Carry out inspection of marine products, its raw materials, fixing standards and specifications, regulate and take all necessary steps for maintaining the quality of sea food that are marketed overseas.
Indian Roads Congress (IRC)	More than 100 Standards on 1. Standards relating to roads, viz. survey, investigation, equipment, design, construction, environment, maintenance, geometrics, safety, road signage & technology. 2. Standards, Specification and Codes of Practice on Bridges and also Guidelines for their inspection, maintenance, testing and rating. 3. Standards Plans and specifications of Ministry of Road Transport & Highways

Ministry of Environment, Forest and Climate Change (MoEFCC)	Effluent and emission standards for different industry/service sectors are provided in the schedule of various rules framed by MoEFCC under the Environment Protection Act.
Ministry of Road Transport and Highways (MoRTH)	Evolves standard specifications for roads and bridges in the country.
National Medicinal Plants Board	Voluntary standards for medicinal plants based on good agricultural/collection practices.
Oil Industry Safety Directorate (OISD)	Product design, safety standards, Codes of practices, Guidance standards in Oil and Gas sector; 112 Standards published.
Petroleum and Explosives Safety Organization (PESO)	Engaged in the activities related to safety in manufacture, possession, use, sale, import, export and handling of explosives, petroleum, flammable and non-flammable compressed gases and other hazardous substances through comprehensive administration of the rules framed under the Explosives Act, 1984 and Petroleum Act 1934
Petroleum and natural Gas Regulatory Body (PNGRB)	Lay down the technical standards and specifications including safety standards in activities related to petroleum, petroleum products and natural gas.
Quality Council of India (QCI)	NABH – Standards for Hospital Accreditation NABET – Standard for School Accreditation
Standardization Testing and Quality Certification (STQC)	E-Gov Standards on the following subjects: 1. Network and Information Security 2. Metadata and Data Standards for Application Domains 3. Quality and Documentation 4. Localization and Language Technology Standards 5. Technical Standards and E-Governance Architecture 6. Legal enablement of ICT systems
Tea Board	Standards for Black, Green, Kangra and Instant tea defined in Tea (Distribution and Export) Control Order, 2005
Dedicated Standards bodies	
Organization	Standard Published
Directorate of Standardization (DoS)	Standards for Defence purchases and codification of defence inventories
Inter Plant Standardization in Steel Industry (IPSS)	Over 350 Standards on Consumable Stores & Equipment, Design Parameters, and Management for SAIL Steel plants
Railways Design & Standards Organization (RDSO)	Development of standards for materials and products specially needed by Indian Railways

Source: [Indian Standards Portal](#)

For more information about organizations/departments of Government of India formulating Standards & Technical Regulations and their area of activity, please [click here](#)

8. Foreign Standards Development Organizations in India

Indian companies and consumers are looking for trusted quality and assurances of the product. This has opened the market for ISO standards based “Quality” certification and trainings for almost anything, including establishment of foreign SDOs in India. These certificates based on global standards add value to the buyer as they bring a level of trust which would not be there otherwise.

8.1. BIS Group India Pvt. Ltd. (BSI)

Since its foundation in 1901, BSI Group has grown into a leading global independent business services organization that inspires confidence and delivers assurance to customers with standards-based solutions. Originating as the world’s first national standards body, the group has over 2,250 staff operating in over 100 countries through more than 50 global offices. The Group’s key offerings are:

- The development and sale of private, national, and international standards and supporting information.
- Second and third-party management systems assessment and certification
- Testing and certification of products and services
- Performance management software solutions
- Training services in support of standards implementation and business best practice.

BSI India is offering over 30,000 standards which are EN, BS, ISO, and PAS standards which you can now buy locally in India in, India Rupees. BSI is registered in India as Indian “for profit” company and is the most dynamic entity with HQ in New Delhi and offices in Bengaluru, Chennai, Hyderabad, Kolkata, and Mumbai.

For more information, please [click here](#)

8.2. DQS Certification India Pvt. Ltd. (DQS-AFNOR)

DQS Certification India Private Limited, a Delhi Quality Services initiative for Corporate Excellence since 1994, is an Authorized Transition Partner with SEI (Software Engineering Institute), Carnegie Mellon University (CMU), Pittsburgh, USA to provide CMMI Assessment and Training Services also known as CMMI Product Suite Services. DQS Certification India Private Limited in partnership with AFAQ-EAQA, AFNOR Groupe, (<http://www.afnor.org/>), the 5th largest Certification and Inspection Organization of the world, provides Management System Certification services also.

DQS Certification India Pvt Ltd prides itself in providing premium quality registration services on value for money costs through competent professionals of high calibre. The attempt is to provide personalized service with a human interface rather than making the client wrestle with faceless organizations and bulky procedural issues. With this intention, DQS Certification India Pvt Ltd, has been able to create a niche for itself in the intensely competitive scenario.

For more information, please [click here](#)

8.3. Project Management Institute (PMI-ANSI)

The Project Management Institute Standards Program was established by the PMI Executive Director with the advice and counsel of the PMI Board of Directors and was commissioned to improve the understanding and competency of experienced and new project management practitioners and customers worldwide. The role of the Standards Program is to identify, define, document, and champion generally accepted project management approaches and a common project management lexicon.

PMI was accredited by the American National Standards Institute (ANSI) as a Standards Developer under the accredited organization method on October 14, 1998 and has successfully completed periodic audits since that time.

For more information, please [click here](#)

8.4. VDE

VDE, the Association for Electrical, Electronic & Information Technologies headquartered in Frankfurt am Main, and represented in Berlin and Brussels as well as with 29 branch offices throughout Germany has a local representative in India based out of National Capital Region, Sonipat Haryana supporting the local industry on VDE testing quality and safety standards.

VDE is the only organization in the world that combines science, standardization, testing, certification, and application consulting under one umbrella.

For more information, please [click here](#)

8.5. IEEE, India

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

IEEE and its members inspire a global community to innovate for a better tomorrow through its more than 422,000 members in over 160 countries, and its highly cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted "voice" for engineering, computing, and technology information around the globe.

IEEE India Operations Center is headquartered in Bengaluru at the World Trade Center, located on Dr. Rajkumar Road in Rajajinagar.

IEEE India Operations Center was established in 2010 with a focus on standards, technical activities, membership development, business development, and support for digital library customers. IEEE India is developing educational programs under the umbrella of the IEEE Blended Learning Program, focused on training and skills development. IEEE India Operations Center is also responsible for the territories of India, Sri Lanka, and Bangladesh for promoting the IEEE *Xplore*® Digital Library. IEEE India's Contact Center provides support for members in India and around the world. IEEE India also has a strong public-policy focus, engaging policy makers and technology experts.

IEEE India provides support to all the geographical units, which include [IEEE India Council](#), [12 Sections](#), 130+ Technical Society Chapters, and 1,140+ Student Branches.

For more information please [click here](#)

8.6. ASTM International-India

ASTM International, formerly known as the American Society for Testing and Materials (ASTM) and is one of the voluntary standards development organizations in the world of trusted source for technical standards for materials, products, systems, and services.

In 2009, technical advisor Mr. Jayakumar Gopalakrishnan, began serving as an ASTM International consultant in India to promote and enhance the awareness and use of ASTM International standards and related products and services relevant to the textile and personal protective equipment industries. In August 2009, India's Central Institute of Plastics Engineering and Technology (CIPET) and ASTM International signed a letter of implementation for a training and collaboration program scheduled to take place in November 2009. Eight technical experts from several CIPET campuses attended an intensive two-week program that included training at ASTM headquarters and participation in the November committee week meetings of Committee D20 on Plastics.

For more information, please click here [more](#)

9. Sources

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Ministry of Housing and Urban Affairs

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10. Acronyms

S. No.	Acronym	Expansion
1	3GPP	3rd Generation Partnership Project
2	A2LA	American Association for Laboratory Accreditation

3	ACMA	Automotive Component Manufacturers Association of India
4	AI	Artificial Intelligence
5	AISC	Automotive Industry Standards Committee
6	ITS	Association for Intelligent Transport Systems
7	AMP	Automotive Mission Plan
8	ANSI	American National Standards Institute
9	APLAC	Asia Pacific Laboratory Accreditation Co-operation
10	APT	Asia Pacific Telecommunication
11	ARAI	Automotive Research Association of India
12	ARIB	Association of Radio Industries and Businesses
13	ASSOCHAM	Associated Chambers of Commerce and Industry of India
14	ASTM	American Society for Testing and Materials
15	ATMA	Automotive Tyre Manufacturers' Association
16	BEE	Bureau of Energy Efficiency
17	BIS	Bureau of Indian Standards
18	BOs	Branch Offices
19	BSI	BSI Group India Pvt. Ltd.
20	BU	billion unit
21	CAB	Conformity Assessment Bodies
22	CAF	Conformity Assessment Framework
23	CAREL	Core Advisory Group for Research and Development (R&D) in Electronics Hardware
24	CASCO	Committee on Conformity Assessment
25	CBIP	Central Board of Irrigation & Power
26	CCA	Controller of Certifying Authorities
27	CCPA	Central Consumer Protection Authority
28	CCS	Combined Charging System
29	C-DAC	Centre for Development of Advanced Computing
30	C-DOT	Centre for Development of Telematics
31	CDR	Conjugate data repetition
32	CEA	Central Electricity Authority
33	CEAMA	Consumer Electronics and Appliances Manufacturers Association
34	CEDC	Civil Engineering Division Council
35	CETEs	Centre for Electronics Test Engineering
36	CeWIT	Center of Excellence in Wireless and Information Technology
37	CGPDTM	Controller General of Patents, Designs & Trade Marks
38	CHAdEMO	CHArge de Move
39	CHDC	Chemical Division Council
40	CII	Confederation of Indian Industries
41	CIPET	Central Institute of Plastics Engineering and Technology
42	CIRT	Central Institute of Road Transport

43	C-MET	Centre for Materials for Electronics Technology
44	CMVR - TSC	Central Motor Vehicles Rules -Technical Standing Committee
45	CNITSEC	China Information Technology Certification Centre
46	COAI	Cellular Operators Association of India
47	CoFIP	Collision free Interlaced pilots
48	CPCB	Central Pollution Control Board
49	CPRI	Central Power Research Institute
50	CPSE	Central Public Sector Enterprise
51	CRS	Compulsory Registration Scheme
52	CSIR	The Council of Scientific and Industrial Research
53	CSS	Centrally Sponsored Scheme
54	DDG	Decentralised Distribution-Cum-Generation
55	DHI	Department of Heavy Industry
56	DIPP	Department of Industrial Policy & Promotion
57	DMIC	Delhi - Mumbai Industrial Corridor
58	DMICDC	Delhi - Mumbai Industrial Corridor Development Corporation Limited
59	DoT	Department of Telecommunications
60	DQS	Delhi Quality Services
61	DRDO	Defence Research and Development Organisation
62	DSCI	Data Security Council of India
63	DST	Department of Science & Technology
64	EBGI	European Business Group India
65	EESL	Energy Efficiency Services Limited
66	EIAs	Export Inspection Agencies
67	EIC	Export Inspection Council
68	ELCINA	Electronic Industries Association of India
69	EMS	Environmental Management Systems
70	EPC	Export Promotion Councils of India
71	ER&DCI	Electronic Research and Development Centre of India
72	ERDA	Electrical Research and Development Association
73	ERTLs	Electronics Regional Test Laboratories
74	ESC	Electronics Export and Computer Software Promotion Council
75	ESDM	Electronic System Design & Manufacturing
76	ETDC	Electrotechnical Division Council
77	ETDCs	Electronics Test and. Development Centres
78	ETSI	European Telecommunications Standards Institute
79	EV	Electric Vehicle
80	FADC	Food and Agricultural Division Council
81	FAME	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles
82	FDI	Foreign Direct Investment

83	FICCI	The Federation of Indian Chambers of Commerce and Industry
84	FIEO	Federation of Indian Export Organizations
85	FMCS	Foreign Manufacturers Certification Scheme
86	FRAND	Fair, Reasonable and Non-Discriminatory
87	GARC	Global Automotive Research Center
88	GC	Governing Council
89	GDG	Green Discussion Group
90	GDP	Gross Domestic Product
91	GISFI	Global ICT Standardization Forum for India
92	GIST group	Graphics and Intelligence based Script Technology
93	G-PON	Gigabit Optical Passive Network
94	GRB (India)	ARAI Working Party on Noise
95	GRE (India)	ARAI Working Party on Lighting and Light-Signaling
96	GRPE (India)	ARAI Working Party on Pollution and Energy
97	GRRF (India)	ARAI Working Party on Brakes and Running Gear
98	GRs	Generic Requirements
99	GRSG (India)	ARAI Working Party on General Safety Provisions
100	GRSP (India)	ARAI Working Party on Passive Safety
101	GSC	Global Standards Collaboration
102	GSM	Global System for Mobile
103	HAPS	High Altitude Platform Station
104	IAF	International Accreditation Forum
105	IBSA	India-Brazil-South Africa
106	IC3S	Indian Common Criteria Certification Scheme
107	ICA	Indian Cellular Association
108	iCAT	International Center for Automotive Technology
109	ICC	International Code Council
110	ICIMOD	International Centre for Integrated Mountain Development
111	ICT	Information and Communications Technology
112	IEC	International Electrotechnical Commission
113	IEEE	Institute of Electrical and Electronics Engineers
114	IEEMA	Indian Electrical & Electronics Manufacturers' Association
115	IEGC	Indian Electricity Grid Code
116	IIP	Indian Institute of Petroleum
117	IIQM	Indian Institute of Quality Management
118	IISc	Indian Institute of Science
119	IMTMA	Indian Machine Tool Manufacturers' Association
120	INFCO	Committee on Information
121	INMARSAT	International Mobile Satellite Organization
122	INSS	Indian National Strategy for Standardization
123	INTELSAT	International Telecommunication Satellite Organization
124	IoT	Internet of Things
125	IP	Intellectual Property

126	IPR	Intellectual Property Rights
127	IRC	Indian Roads Congress
128	IRs	Interface Requirements
129	ISGF	India Smart Grid Forum
130	ISGTF	India Smart Grid Task Force
131	ISI	Indian Standards Institute
132	ISMS	Information Security Management System
133	ISO	International Organization for Standardization
134	ISRO	Indian Space Research Organisation
135	IT&E	Information Technologies and Electronics
136	ITA 2000	Information Technology Act 2000
137	IT-ITeS	Information Technology - Information Technology Enabled Services
138	ITS	Intelligent Transportation Systems
139	ITSM	IT Service Management
140	ITTAC	Indian Tyre Technical Advisory Committee
141	ITU	International Telecommunication Union
142	KYC	Know Your Customer
143	LITDC	Electronics and Information Technology Division Council
144	LTE	long-term evolution
145	M2M	Machine To Machine
146	MAIT	Manufacturers' Association for Information Technology
147	MAXs	Main Automatic Exchanges
148	MCIT	Ministry of Communications & Information Technology
149	MDA	Market Development Assistance
150	MEDC	Mechanical Engineering Division Council
151	MeitY	Ministry of Electronics & Information Technology
152	MHDC	Medical Equipment and Hospital Planning Division Council
153	MLA	Multilateral Recognition Arrangement
154	MNES	Ministry of Non-Conventional Energy Sources
155	MNRE	Ministry of New and Renewable Energy
156	MoCA	Ministry of Consumer Affairs
157	MoEF	Ministry of Environment & Forests
158	MoHI&PE	Ministry of Heavy Industries & Public Enterprises
159	MoP	Ministry of Power
160	MoRT&H	Ministry of Road Transport & Highways
161	MoU	Memorandum of Understanding
162	MoUD	Ministry of Urban Development
163	MRA	Mutual Recognition Agreement
164	MSDC	Management and Systems Division Council
165	M-SIPS	Modified Special Incentive Package scheme
166	MSME	Ministry of Micro, Small & Medium Enterprises
167	MTDC	Metallurgical Engineering Division Council
168	NABCB	National Accreditation Board for Certification Bodies

169	NABET	National Accreditation Board for Education and Training
170	NABH	National Accreditation Board for Hospitals and Healthcare Providers “
171	NABL	National Accreditation Board for Testing and Calibration Laboratories
172	NAMP	National Air Monitoring Programme
173	NASSCOM	National Association of Software and Services Companies
174	NATRAX	National Automotive Test Tracks : Indore, Madhya Pradesh
175	NATRIP	National Automotive Testing and R&D Infrastructure Project
176	NATRIP	The National Automotive Testing and R&D Infrastructure Project
177	NCST	National Centre for Software Technology
178	NCVRS	National Center For Vehicle Research & Safety
179	NDCP	National Digital Communications Policy
180	NeGP	National e-Governance Plan
181	NEMMP	National Electric Mobility Mission Plan
182	NFV	Network Function Virtualization
183	NGN	Next Generation Network
184	NIAIMT	National Institute for Automotive Inspection, Maintenance & Training
185	NIC	National Informatics Centre
186	NIIPM	National Institute of Intellectual Property Management
187	NIMZs	National Investment & Manufacturing Zones
188	NInC	National Innovation Council
189	NIP	New Item Proposal
190	NIUA	National Institute Of Urban Affairs
191	NMCC	National Manufacturing Competitiveness Council
192	NMP	National Manufacturing Policy
193	NNI	Network-Network Interfaces
194	NPE	National Policy on Electronics
195	NRP	National Rail Plan
196	NSGM	National Smart Grid Mission
197	NT	Network
198	NTP	National Telecom Policy
199	PASC	Pacific Asia Standards Congress
200	PCDC	Petroleum, Coal and related Products Division Council
201	PCS	Public Charging Stations
202	PDPB	Personal Data Protection Bill
203	PGEDC	Production and General Engineering Division Council
204	PIII	Public Information Infrastructure and Innovations
205	PIS	Patent Information System
206	PLI	Production Linked Incentives

207	PMA	Preferential Market Access Policy
208	PMI	Project Management Institute
209	PMUs	Phasor Measurement Units
210	PPP	Public Private Partnership
211	PRSG	Project Review and Steering Groups
212	PSI	Product Specific Information
213	PSUs	Public Sector Undertakings
214	QCI	Quality Council of India
215	QMS	Quality Management System
216	QoS	Quality of Service
217	R&D	Research and Development
218	RBI	Reserve Bank of India
219	RC	Regional Coordination
220	RDSO	Research Design and Standards Organisation
221	REMCO	Committee on Reference Materials
222	RET	Renewable Energy Technology
223	RNES	Radio Network Evolution and Spectrum
224	ROs	Regional Offices
225	RvA	Raad vor Accreditatie (Dutch Council for Accreditation)
226	SAARC	South Asian Association for Regional Co-operation
227	SACC	Scientific Advisory Committee of the Cabinet
228	SACEP	South Asia Co-operative Environment Programme
229	SARSO	South Asian Regional Standards Association
230	SASA	Services, Applications, Systems and Architectures
231	SCL	Semiconductor Complex Limited
232	SDN	Software Defined Networking
233	SDO	Standard Development Organization
234	SDO	Standards development organization
235	SDoC	Self-Declaration-of Conformity
236	SEPs	Standards Essential Patents
237	SERB	Science and Engineering Research Board
238	SERC	State Electricity Regulatory Commissions
239	SESEI	Seconded European Standardization Expert in India
240	SG	Study Groups
241	SIAM	Society of Indian Automobile Manufacturers
242	SIG	Special Interest Group
243	SMEs	small and medium enterprises
244	SMNP	Smart Meter National Programme
245	SNAP	Standards National Action Plan
246	SR	Service Requirements
247	SSC	Sector Skill Council
248	STQC	Standardization Testing and Quality Certification
249	TCL	Telecommunications Consultants (India) Limited
250	TCOE	Telecom Centres of Excellence

251	TCs	Technical Committees
252	TDB	Technology development Board
253	TDSAT	Telecommunications Dispute Settlement and Appellate Tribunal
254	TEC	Telecom Engineering Centre
255	TEDC	Transport Engineering Division Council
256	TEMA	Telecom Equipment Manufacturers Association of India
257	TEPC	Telecom Equipment and Services Export Promotion Council
258	TRAI	Telecom Regulatory Authority of India
259	TSDSI	Telecommunication Standards Development Society for India
260	TSPs	Telecom Service Providers
261	TSSs	Technical Standards
262	TSTP	Test Schedule & Test Procedures
263	TXDC	Textile Division Council
264	UIDAI	Unique Identification Authority of India
265	UNCED	United Nations Conference on Environment and Development
266	UNEP	United Nations Environment Programme
267	UNI	User-Network Interfaces
268	UNICEF	United Nations International Children's Emergency Fund
269	VRDE	Vehicle Research and Development Establishment
270	WG	Working Groups
271	WRDC	Water Resources Division Council
272	WTO/TBT	World Trade Organization - Technical Barriers to Trade