



# “Indian Electrical Power Equipment Industry and Electronics Industry including Consumer Electronics”

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# Outline

- Indian Electrical Power Equipment and Power sector
  - Introduction, Market status, Major players, Growth drivers and government policy initiatives
- Indian Electronics/consumer sector
  - Introduction, Market status, Major players, Growth drivers and government policy initiatives
- Standardization work
- Conclusion



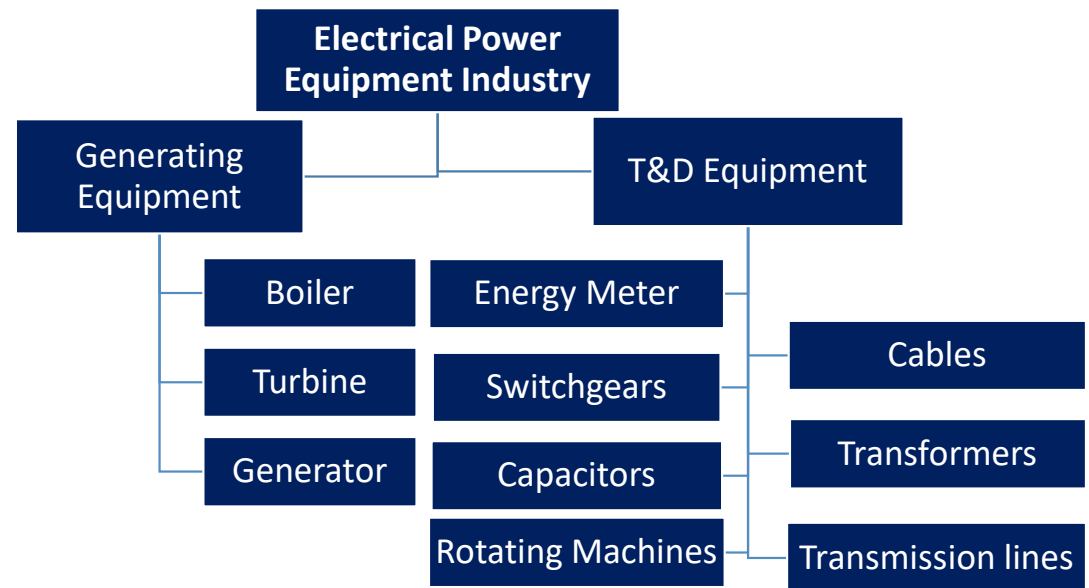
# Indian Electrical Power Equipment and Power sector



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# Introduction

- Generation equipment sector accounts 15%, while T&D equipment sector accounts 85% of the total market.
- Contributes 7.8% of the manufacturing sector in terms of value and 1.23% of India's GDP, providing a direct employment to 500k persons and indirect employment to 1 million people and over 5 million people across the entire value chain
- Diversified, matured and strong manufacturing base, with robust supply chain
- Presence of large SMEs, large conglomerate with major foreign players, either directly or through technical collaborations with Indian manufacturers
- State-of-art technology in most sub-sectors at par with global standards
- Third-largest producer and second-largest consumer of electricity in the world
- Various sources of power generation in India are Thermal Power, Renewable Power, Hydro Power and Nuclear Power.
- With development of new technologies, the **smart grid** and **smart meters** across the world are undergoing a massive transformation.



# Current Status: (Electrical Power Equipment Industry)

## Industry Production (Estimated) for 2019-20

- Approx. 22 Billion Euro

## Exports

- Approx. 7.4 Billion Euro
- **Major Export Markets:** United States of America, United Arab Emirates, Germany, United Kingdom, Nigeria, Saudi Arabia, Australia, Brazil, Canada, France
- **Major Export Products:** Switchgear and Control gear, Transformers & Parts, Industrial Electronics, Cables, Transmission Line Towers, Conductors, Rotating Machines (Motors, AC Generators, Generating Sets) & Parts

## Imports:

- Approx. 8.3 Billion Euro

Size of Capital Goods industry market size is approx. €78.5 Billion while Power Equipment share in it is about 55%

# Current Status: (Power Industry)

In 2020, gross electricity consumption was 1,208 kWh per capita.

India's installed power capacity: 393.38 GW as of December 2021

- **Total fossil fuel: 235.21 GW**
- **Total Non-Fossil fuel: 158.17 GW**

Total fossil fuel: 235.219 GW

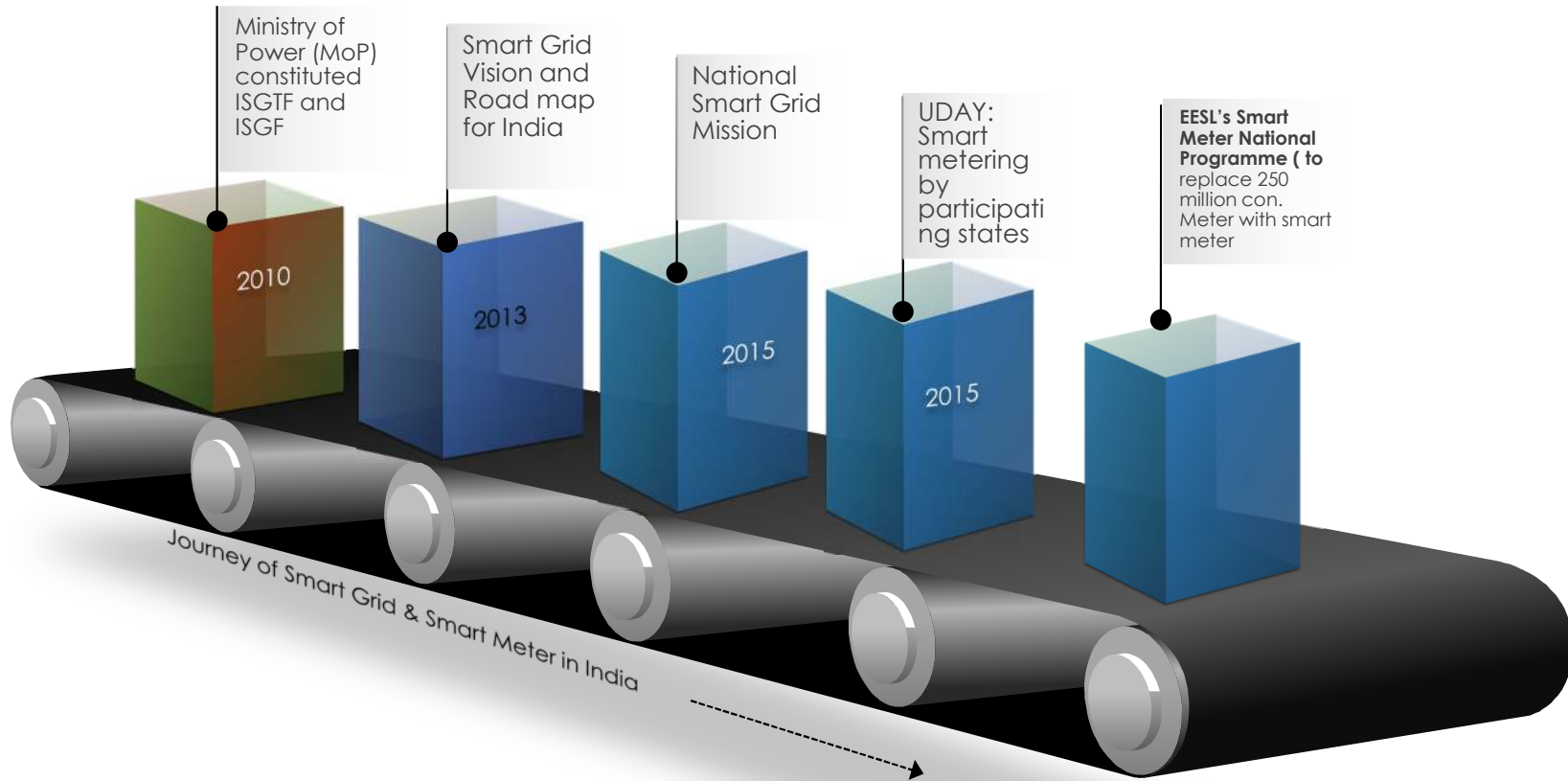
- **Coal: 203.19 GW**
- **Gas: 24.90 GW**
- **Lignite: 6.62 GW**
- **Diesel: 510 MW**

Total non-fossil based installed energy capacity: 158.171 GW

- **Renewable Energy (RE): 151.39 GW**
  - solar: 49.34 GW,
  - wind: 40.08 GW,
  - Small hydro Power: 4.83 GW,
  - Bio-power: 10.17 GW,
  - Large Hydro: 46.51 GW
- **Nuclear energy: 6.78 GW**
- **Waste to Energy: 434 MW**

Fossil fuel sources account around 60% while non-fossil fuel sources account over 40% of the total installed electricity capacity of 393.38 GW

# Journey of Smart Grid & Smart meter in India



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# Status of Smart Grid Projects- January 2022

Status of NSGM Smart Grid Projects – January 2022

| S. No. | Utility/Project Area                       | Location  | Project Functionalities | Consumers | Project Cost (~Euro Million)   | Project Status   |
|--------|--|---|-------------------------|-----------|--|--|
| 1      | CED, Chandigarh (Sub Div-5)                | Sub Division 5 of Chandigarh                        | AMI, DTMU, SCADA        | 29.43K    | Approved Project Cost: 3.5<br>Gol Support: 1.04<br>Released: 0.94        | Till date, 19.025K smart meters installed in field   |
| 2      | JVVNL, Rajasthan (6 Urban Towns)           | Baran, Bharatpur, Bundi, Dholpur, Jhalawar, Karauli | AMI                     | 150K      | Approved Project Cost: 10.6<br>Gol Support: 3.2<br>Released: 0.3         | Till date, 87.646K smart meters installed in field   |
| 3      | CED, Chandigarh (Complete City Excl. SD-5) | Complete Chandigarh City (excl. SD5)                | AMI                     | 184K      | Revised Project Cost: 16 (Revised).<br>Gol Support: 4.8<br>Released: 0.9 | Revised sanction for AMI / Smart Metering with MBC and additional service cables issued on 9th December 2021 |

Status of Smart Grid Pilot Projects (Under IPDS) – January 2022

| S. No. | Utility/Project Area                 | Location                           | Project Functionalities                                      | Consumers | Project Cost (~Euro Million)                               | Project Status  |
|--------|--------------------------------------|------------------------------------|--|-----------|--|---|
| 1      | IIT Kanpur Smart City Pilot          | Smart City Pilot in IITK Campus    | NA   | NA        | Project Cost: 1.4<br>Gol Support: 0.7                      | Completed   |
| 2      | CEEC, Mysore                         | V Mohalla, Mysore                  | AMI, OMS, PLM, MG/DG   | 21.82K    | Project Cost: 4<br>Gol Support: 2                          | Completed   |
| 3      | UHBVN, Haryana                       | Panipat City Sub-Division          | AMI, PLM, OMS  | 10.18K    | Project implemented under grant from NEDO (Japan).         | Completed   |
| 4      | Smart Grid Knowledge Center, Manesar | POWERGRID Complex, Manesar         | AMI, OMS, MG/DG, EVCI, HEMS, Cyber Security & Training Infra | NA        | Project Cost: 0.7 Gol Support 0.7                          | Completed   |
| 5      | HPSEB, Himachal Pradesh              | Kala Amb Industrial Area           | AMI, OMS, PLM  | 1.33K     | Project Cost: 2.37<br>Gol Support: 1.2                     | Completed   |
| 6      | UGVCL, Gujarat                       | Naroda                             | AMI, OMS, PLM, PQ  | 22.23K    | Project Cost: 2.8<br>Gol Support: 1.4<br>Project Cost: 4.3 | Completed   |
| 7      | PED, Puducherry                      | Division 1 of Puducherry           | AMI  | 33.49K    | Gol Support: 2.16<br>Project Cost: 0.85                    | Completed   |
| 8      | WBSEDCL, West Bengal                 | Siliguri Town                      | AMI, PLM   | 5.26K     | Gol Support: 0.42<br>Project Cost: 2.4                     | Completed   |
| 9      | APDCL, Assam                         | Guwahati Division                  | AMI, PLM   | 14.51K    | Gol Support: 1.16<br>Released: 1.16                        | Completed   |
| 10     | TSSPDCL, Telangana                   | Jeedimetla Industrial Area         | AMI, PLM, OMS, PQ  | 11.90K    | Project Cost: 4.25<br>Gol Support: 2.13 Released: 1.7      | Project Completed<br>Final claim with closure report submitted. |
| 11     | TSECL, Tripura                       | Electrical Division No.1, Agartala | AMI, PLM   | 45.29K    | Project Cost: 7.7<br>Gol Support: 3.8<br>Released: 3.09    | Project termination intimated in Jan 2022.                      |

Source: <https://www.nsgm.gov.in/sites/default/files/SG-Projects-Status-January-2022.pdf>





# Status of Smart Meters

- According to National Smart Grid Mission website:
  - More than 3.94 million smart meters have been installed out of total allocated quantity of 11.24 million smart meters
- Various agencies have been installing Smart meter:
  - EESL: 2.34 million Smart meters
  - PFC consulting Limited: 70.35K SMs
  - RECPDCL: 51.14K smart meters
  - Other power utilities: 1.47 million smart meters
- Government has been installing smart meter through various schemes such as Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY), Integrated Power Development Scheme, (IPDS), NSGM, UDAY etc.

| All India Status   |                  |                 |                      |                 |
|--------------------|------------------|-----------------|----------------------|-----------------|
| Agency Wise        | Sanctioned       | Installed SM    | Installed SM Prepaid | In Stock        |
| EESL               | ~7.81 Mn         | ~2.34 Mn        | ~592.94K             | ~266.61K        |
| PFCL               | ~151.74K         | ~70.35K         | 0                    | 12.03K          |
| RECPDCL            | ~144.93K         | ~51.14K         | 0                    | ~6.19K          |
| Utility            | ~3.13 Mn         | ~1.47 Mn        | ~55.49K              | ~87.55K         |
| <b>Grand Total</b> | <b>~11.24 Mn</b> | <b>~3.94 Mn</b> | <b>~648.44K</b>      | <b>~372.39K</b> |
| Scheme Wise        | Sanctioned       | Installed SM    | Installed SM Prepaid | In Stock        |
| DDUGJY             | ~39.20K          | ~38.40K         | 0                    | 0               |
| IPDS               | ~2.10 Mn         | ~1.34 Mn        | ~527.50K             | ~212.87K        |
| NSGM               | ~723.43K         | ~122.55K        | 0                    | ~50.92K         |
| PMDP               | ~115.50K         | ~30.37K         | 0                    | ~2.22K          |
| SG Pilot           | ~156.53K         | ~156.53K        | 0                    | 0               |
| UDAY               | ~338K            | ~208.33K        | ~6.89K               | ~15.68K         |
| Utility Owned      | ~7.77 Mn         | ~2.04 Mn        | ~114.04K             | ~90.68K         |
| <b>Grand Total</b> | <b>~11.24 Mn</b> | <b>~3.94 Mn</b> | <b>~648.44K</b>      | <b>~372.39K</b> |



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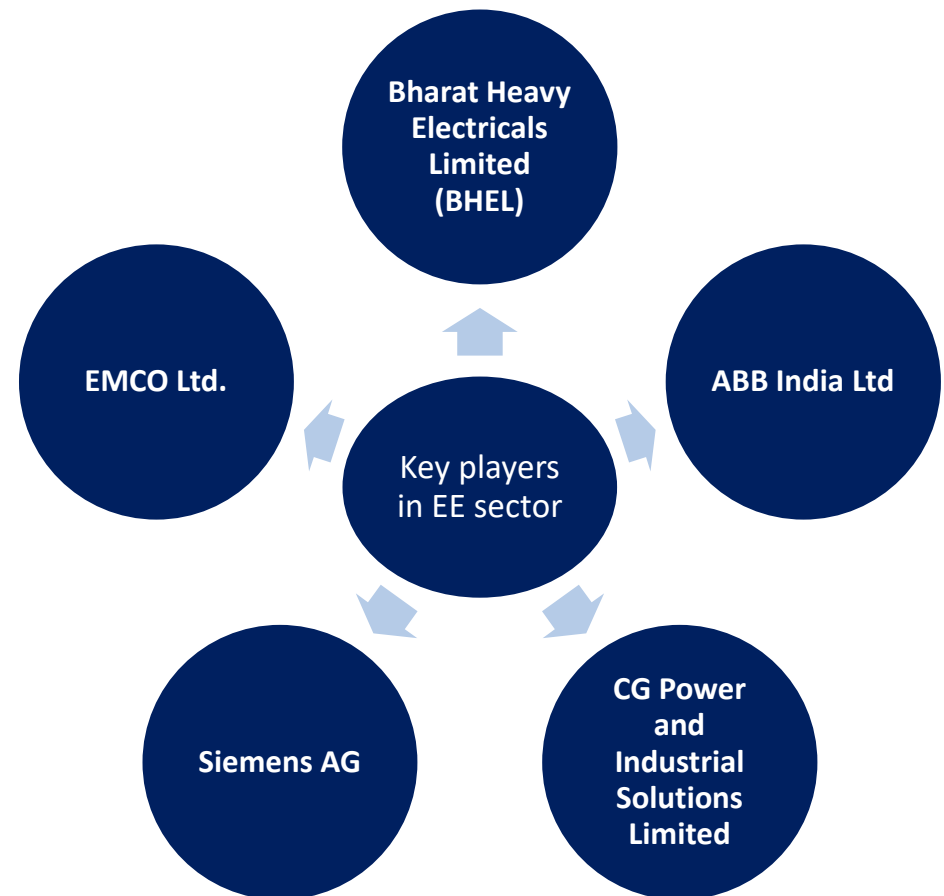
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# Market Players in Electrical Power Equipment sector

## Top 5 companies:

1. **BHEL:** India's largest power generation equipment manufacturer and also engaged in engineering, design, manufacturing, construction, testing commissioning, and servicing of a wide range of products.
2. **ABB India:** It is operating mainly in power, heavy electrical equipment and automation technology areas.
3. **Siemens AG:** manufactures steam turbines, turbo compressors, high-voltage switchgear (circuit breakers, disconnectors and gas-insulated switchgear), switchboards, remote monitoring systems (RMS), fire detectors and suppression systems, motors and generators, relays and Smart Grid systems, transformers, and advanced medical imaging equipment.
4. **CG Power and Industrial Solutions Limited:** An Indian MNC engaged in design, manufacturing, and marketing of products related to power generation, T&D.
5. **EMCO LIMITED:** one of India's leading products and solutions providers up to 765 kV/  $\pm$  800 kV for power generation, transmission, distribution utilities and industry

Other main companies in Indian Electrical Equipment industry are Larsen and Toubro Ltd., Schneider Electric SE, Fuji Electric Co. Ltd., TD Power Systems Pvt. Ltd., Toshiba Corp. etc.

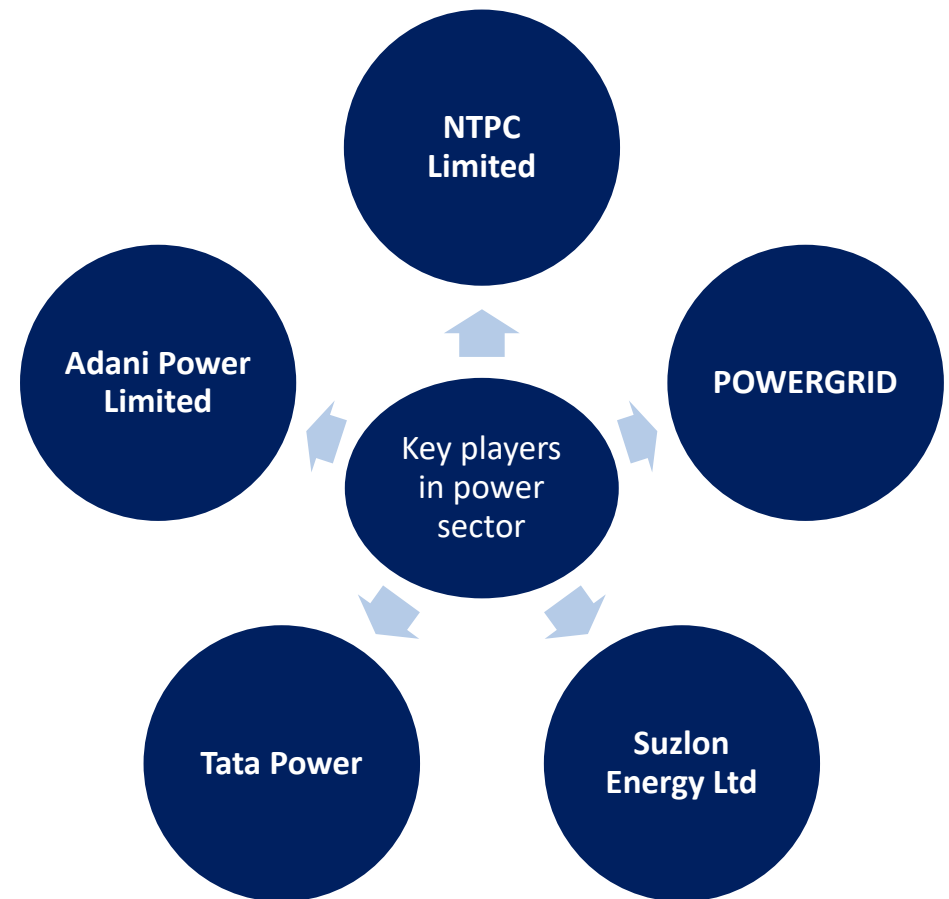


# Market Players in Power sector

## Top 5 companies:

1. **NTPC Limited:** India's largest power utility with an installed capacity of 67,907.5 MW (including JVs)
2. **POWERGRID, an Indian state-owned electric utility company:** Its transmission network consists of roughly 168,140 circuit kilometers and 252 EHVAC and HVDC substations, with total transformation capacity of 422,430 MVA
3. **Suzlon Energy Ltd.:** One of India's leading renewable energy companies with an installed capacity of 18990+ MW.
4. **Tata Power:** India's largest integrated power company. The Company together with its subsidiaries & joint entities, has a generation capacity of 13,061 MW of which 32% comes from clean energy sources.
5. **Adani Power Limited:** the largest private thermal power producer in India with power generation capacity of 12,450 MW

Other key power generation companies are Reliance Power, Torrent Power, Adani Green Energy Ltd., ReNew Power, JSW Energy Ltd etc.



# Growth Drivers

## Increasing energy demand

- To meet the increasing demand for electricity, massive addition to the installed generating capacity is required.

## Technological upgradation

- Government focus on implementation of smart technologies like an evolved grid system, smart metering, digital asset management will help transform the seemingly traditional, manpower-heavy sector into a smarter, more efficient power system with each element in the value chain re-imagining their processes and streamlining infrastructure.

## Increasing residential and commercial sectors

- Growth of residential and commercial sectors lead to an increase in the demand for power, thereby driving the demand for cables.

## Policy reforms

- Government schemes such as Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY), Power to All, Integrated Power Development Scheme, UDAY, UJALA etc. have augmented electrification across the country.



# Government Policies and new Initiatives



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# National Energy Policy (NEP) (Draft)

- NITI Aayog, policy think tank of the GoI released draft National Energy policy (NEP) in June 2017 with aims to chart the way forward to meet the Government's recent bold announcements in the energy domain

- **Key objectives are as follow:**

- Access at affordable prices
- Improved security and Independence
- Greater Sustainability
- Economic Growth

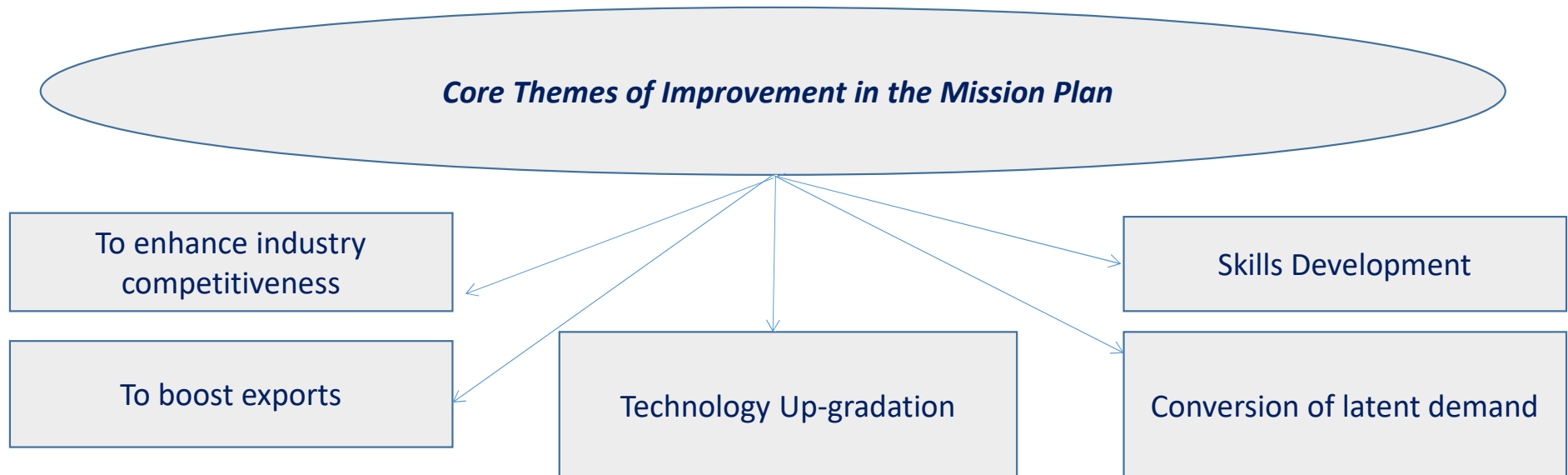


- Policy targets to achieve a 175 GW renewable energy capacity by 2022, and share of non-fossil fuel based capacity in the electricity mix is aimed at above 40% by 2030.
- Policy aims to increase share of manufacturing in GDP up to 25% by 2022
- 24x7 electricity by 2022
- the period 2017-2040 is expected to witness a quantum leap in the uptake of renewable energy, drastic reduction in energy intensity, doubling of per-capita energy consumption and tripling of per-capita electricity consumption

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# Indian Electrical Equipment Industry Mission Plan 2022

- Developed by DHI in consultation with all stakeholders and with support from IEEMA
- Vision 2022:
  - To make India the country of choice to produce electrical equipment
  - and reach an output of approx. €85.4 billion by balancing exports and imports



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# Smart Grid Vision and Road map for India

- In 2013 [Smart Grid Vision and Road map for India](#) was approved by Ministry of Power 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.

## Smart Grid Vision for India

*“Transform 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”*

- Road map covers the 12<sup>th</sup> , 13<sup>th</sup>, and 14<sup>th</sup> 5-year plan periods from 2012 to 2027

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# National Smart Grid Mission (NSGM)

- MoP launched NSGM in 2015 with aims to accelerate Smart Grid deployment in India
- Major activities envisaged under NSGM are:
  - Development of smart grid,
  - Development of micro grids,
  - Consumer engagements and training & capacity building etc.
- Development/deployment of SGs are presently being carried out through [India Smart Grid Forum \(ISGF\)](#) under the aegis of MoP
- **Smart Grid Projects under NSGM:** following projects have been sanctioned under NSGM:

| Pilot Projects under NSGM            |                    |            |
|--------------------------------------|--------------------|------------|
| City                                 | Smart Meters (nos) | Completion |
| Chandigarh (Sub-division 5)          | 29.5K              | Mar-22     |
| Chandigarh (Entire city except SD-5) | 184K               | Mar-22     |
| Ranchi (Jharkhand)                   | 360K               | Mar-24     |
| Rajasthan (six towns)                | 150K               | Mar-22     |
| <b>Total</b>                         | <b>723.5K</b>      |            |

- Government has sanctioned more than 723k smart meter for deployment in four pilot projects and as of February 28th, 2022, a total of over 122.5K smart meters were installed.

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# Some other policy and new initiatives

## Integrated Power Development Scheme (IPDS): launched by MoP on 3rd December 2014 for urban areas.

- To Strengthen sub-transmission, distribution networks, metering of distribution transformers / feeders / consumers in urban areas.
- ~1.34 million smart meters have been installed as of February 2022.

## Ujwal Discom Assurance Yojana (UDAY) launched by MoP in November 2015:

- to improve operational & financial efficiency of the State Power Distribution Companies (DISCOMs).
- Scheme covers 32 states and all Union Territories.
- Government has also launched 'UDAY 2.0' scheme, with an aim to install smart prepaid metres, prompt payments by DISCOMs, ensure short-term availability of coal and revive gas-based plants.

## Revamped Distribution Sector Scheme (RDSS):

- to Improve the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.
- Scheme outlay: ~€37 billion
- REC and PFC are nodal agencies for facilitating the implementation of scheme

## Smart Meter National Programme:

- launched by EESL under MoP to eventually replace 250 million conventional meters with smart meters across India.
- EESL has signed MoUs/Agreements for smart meters with the states of Andhra Pradesh, Uttar Pradesh, Haryana, Bihar, NDMC-Delhi, Rajasthan, Telangana and for prepaid meters with the states of Uttar Pradesh and Tripura.

## Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) launched in July 2015:

- to provide electrification to all villages.
- Scheme outlay: approx. €9.25 billion
- 38.4K smart meter have been installed under DDUGJY, out of total allocated quantity of 39.2K.

## National Wind-Solar Hybrid Policy launched by MNRE in May 2018:

- to provide a framework for promotion of large grid connected wind-solar PV hybrid system
- to encourage new technologies, methods and way-outs involving combined operation of wind and solar PV plants.



# Some other policy and new initiatives

## Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA) launched by Gol in September 2017:

- to provide energy access to all
- 100% household electrification achieved

## Power for ALL:

- a Joint Initiative of Government of India (GoI) and State Governments
- to provide 24x7 power available to all households, industry, commercial businesses, public needs, any other electricity consuming entity and adequate power to agriculture farm holdings.

## Street Lighting National Programme (SLNP) launched in January 2015:

- to replace conventional street lights with smart and energy efficient LED street lights.
- As on date, over 12 million LED Street lights have been installed by EESL across India.

## Unnat Jyoti by Affordable LEDs for All (UJALA) launched in January 2015:

- to provide LED bulbs to domestic consumers for replacement of incandescent bulbs
- Till date, over 367.9 million LED bulbs, 7.20 million LED Tube lights and 2.34 million Energy efficient fans distributed by EESL across India

## Revised “Guidelines & standards for charging infrastructure for electric vehicle” issued by MoP in January 2021:

- to enable a faster adoption of electric vehicles in India by ensuring safe, reliable, accessible and affordable Charging Infrastructure and eco-system.

## Cybersecurity guidelines for the power sector:

- MoP and CEA released cybersecurity guidelines for power sector to be adhered by all Power Sector utilities to create cyber secure eco system.
- CEA is also working on cybersecurity regulations.



# Indian Electronics sector including Consumer Electronics



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# Introduction

- Electronics industry is one of the largest and fastest growing industries in India
- **Classification:**
  - **Consumer Electronics**
  - Industrial Electronics
  - Electronic Components
  - Communication & Broadcasting (C&B) Electronics
  - Computer Industry
  - Strategic Electronics
  - Automotive Electronics
- **Consumer Electronics** can be further classified into following segments:
  - Mobile Phones
  - Televisions,
  - Refrigerators
  - Set-top Boxes
  - Digital Cameras
  - Air Conditioners
  - Washing Machines etc.
- Consumer Electronics is one of the fastest growing segments and has market share of 52% in total production of electronics goods.



# Current status

- Exports of electronic products are to increase from the projected ~€12.8 bn 2021-22 to ~€102.4 bn by 2026.

Electronics industry - estimated exports trend over next 5 years

| Product segment                             | 2020-21 (~Euro billion) | 2025-26 (~Euro billion) |
|---|-------------------------|-------------------------|
| Mobile Phones                               | 2.64                    | 44.5-49.5               |
| IT hardware (laptops, tablets)              | 0.17                    | 10.2-14.5               |
| Consumer electronics (TV, audio)            | -                       | 1.7-2.5                 |
| Electric vehicles                           | -                       | -                       |
| LED lighting                                | -                       | 7.7-10.2                |
| Wearables and Hearables                     | -                       | 1.7-2.5                 |
| PCBA  | 0.25                    | 7.7-10.2                |
| Industrial electronics & components         | 5.37                    | 11.9-15.5               |
| Sub-assemblies                              | 0.17                    | 1.7-2.5                 |
| Electronic fans                             | -                       | 0.8-1.7                 |
| AC components (controller, BLDC Motor etc.) | -                       | 0.8-1.7                 |
| <b>Total</b>                                | <b>8.62</b>             | <b>89.6-110.9</b>       |

- Electronics production industry is stood at ~€63.76 bn in 2020-21 and is expected to grow to ~€256 bn by 2025-26.
  - Mobile Phones (40.16%): 25.6 bn
  - Consumer Electronics (12.7%): 8.1 bn
  - Strategic Electronics (5.3%): 3.4 bn
  - IT Hardware (4%): ~2.5 Euro bn
  - LEDs (3%): ~1.9 Euro bn
  - Industrial Electronics (14%): ~8.9 Euro bn
  - Auto electronics (8%): ~5.1 Euro bn
  - Electronic components (12%): ~7.7 Euro bn and
  - PCBA (0.7%): ~0.4 Euro bn
- Consumer electronic sector contributes more than half (52%) of the total electronics production in country.
  - Industry is stood at ~€33.7 bn (including Mobile phones, TV and audio) in 2020-21 and is expected to reach ~€128 bn by 2025-26.

Roadmap to manufacture ~€256 billion electronic products

| Product segment                  | 2020-21 (~Euro billion) | 2025-26 (~Euro billion) |
|----------------------------------|-------------------------|-------------------------|
| Mobile Phones                    | 25.6                    | 107.56                  |
| IT hardware (laptops, tablets)   | 2.56                    | 21.34                   |
| Consumer electronics (TV, audio) | 8.1                     | 19.63                   |
| Strategic electronics            | 3.4                     | 10.24                   |
| Industrial electronics           | 8.96                    | 21.34                   |
| Wearables and Hearables          | -                       | 6.82                    |
| PCBA                             | 0.42                    | 10.24                   |
| Auto electronics                 | 5.12                    | 19.63                   |
| LED lighting                     | 1.87                    | 13.65                   |
| Telecom equipment                | -                       | 10.24                   |
| Electronic components            | 7.68                    | 15.36                   |
| <b>Total</b>                     | <b>63.76</b>            | <b>256</b>              |

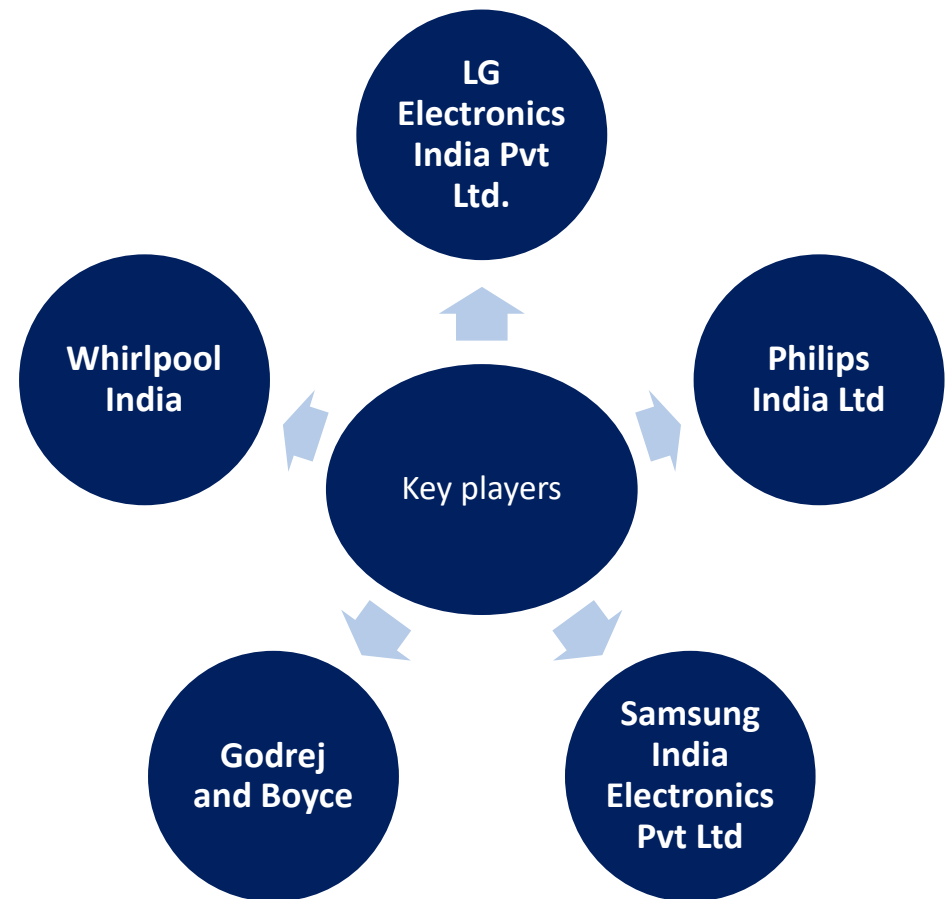


# Market Players

## Top 5 companies:

- **LG Electronics India Pvt Ltd:** televisions, home theater systems, refrigerators, washing machines, computer monitors, wearable devices, smart appliances, and smartphones etc.
- **Philips India Ltd:** Home Appliances, lighting, medical equipment and audio equipment etc.
- **Samsung India Electronics Pvt Ltd:** Smartphone, mobile phones, chips, flash memory, semiconductors and hard drive devices.
- **Godrej and Boyce:** refrigerators, washing machines, air conditioners, industrial products etc.
- **Whirlpool India:** Refrigerators, Washing Machines, Air Conditioners, Microwave Ovens, and small appliances and caters to both domestic and international markets

Other key companies are Crompton Greaves Consumer Electricals Ltd, Havells India, Voltas, Bajaj Electricals, Blue Star etc.



# Growth Drivers

## Growing middle-class population and rising disposable incomes

- Growing middle-class population is leading to an increase in the demand for more housing units

## Increasing adoption of high-end technology devices

- Demand for smart and connected devices

## Electric vehicles and connected mobility related applications

- Huge opportunities for power electronics devices and components, including power management semiconductors, etc.

## Supportive government Policies

- PLI scheme, Modified Special Incentive Package Scheme (M-SIPS) and Electronic Development Fund (EDF) etc.





# Government Policies and new Initiatives



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# National Electronics Policy (NEP) 2019

- Government approved new electronics policy in February 2019, which was proposed by MEITY in 2018 and it replaces NEP 2012.

## **Vision:**

- Policy aims to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities for developing core components and creating an enabling environment for the industry to compete globally.

## **Objectives:**

- To promote domestic electronics manufacturing industry
- To improve ease of doing business
- Promotion of Industry-led R&D and innovation in all sub-sectors of electronics
- To support a comprehensive Start-up ecosystem in emerging technology areas such as such as 5G, IoT/ Sensors, AI, ML, Additive Manufacturing etc.
- Promote R&I and support to industry for green processes and sustainable e-Waste management, including safe disposal of e-Waste in an environment friendly manner, development of e-Waste recycling industry and adoption of best practices in e-Waste management.

## **Targets:**

- Promote domestic manufacturing and export in the entire value-chain of ESDM for economic development to achieve a turnover of approx. 341 billion Euro by 2025.
- Targeted production of 1 billion mobile handsets by 2025, valued at approx. 162 billion Euro, including 600 million mobile handsets valued at approx. 93.9 billion Euro for export.

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# Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing

- As part of the National Policy on Electronics, Government notified “Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing” in April 2019.
- Scheme proposes a financial incentive to boost domestic manufacturing and attract large investments in the electronics value chain including electronic components and semiconductor packaging.
- **Incentive:**
  - 4% to 6% on incremental sales (over base year) of goods manufactured in India
- **Target segments:**
  - Mobile phones and specified electronic components including assembly, testing, marking, and packaging (ATMP) units
- According to [Economic Survey](#), India saw production worth ~8.2 billion Euro under PLI scheme for large-scale electronics.
  - ~2.5 billion Euro worth products were exported till June 2021
- Government is expecting an investment of ~4.15 billion Euro under the PLI scheme by 2025.

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# Modified Special Incentive Package Scheme (M-SIPS)

- **Government announced M-SIPS in July, 2012**
  - to promote large scale manufacturing in the country
  - to offset disability and attract investments in Electronics System Design and Manufacturing (ESDM) Industries
- **Scheme provides**
  - Capital Subsidy - 20% for investments in Special Economic Zones (SEZs) and 25% in non-SEZs.
  - Incentives for both new units and expansion units.
- **Incentives are available for 29 category of ESDM products including:**
  - telecom, IT hardware, consumer electronics, medical electronics, automotive electronics, solar photovoltaic, LEDs, LCDs, strategic electronics, avionics, industrial electronics, nano-electronics, semiconductor chips and chip components, other electronic components.
- **Under M-SIPS, 419 investment proposals involving investment of approximately €13.8 billion have been received till December 12, 2018. Out of these 419 applications:**
  - 197 applications with proposed investment of approximately €5 billion have been approved;
  - 19 applications with proposed investment of approximately €1.8 billion have been recommended by the Appraisal Committee for approval and
  - 203 applications with proposed investment of approximately €6.9 billion are under appraisal.

[Read more>>](#)



# Compulsory Registration Scheme (CRS)

- **Ministry of Electronics and Information Technology (MEITY) along with Bureau of Indian Standards (BIS) has introduced “[Compulsory Registration Scheme \(CRS\)](#)” in 2012.**
  - MEITY notified "[Electronics and Information Technology Goods \(Requirement for Compulsory Registration\) Order, 2012](#)" for fifteen categories of electronics products in 2012. The order would be suppressed by the "[Electronics and Information Technology Goods \(Requirement of Compulsory Registration\) Order, 2021](#)"
  - Another 15 product categories were added in 2014.
  - Ministry of New Renewable Energy (MNRE) issued [new set of quality norms and standards](#) for all solar equipments in 2017 that mandate the sellers and makers of solar modules, one of the key components of solar projects, to get their products registered under quality parameters set by BIS.
  - BIS is operating the scheme as per the provision of Scheme - II of the [BIS \(Conformity Assessment\) Regulations, 2018](#).
  - List of products covered under Compulsory Registration Scheme is [available here>>](#)



# Other schemes

## Electronics Manufacturing Clusters (EMC) scheme launched in 2012:

- to provide support for creation of world-class infrastructure for attracting investments in ESDM Sector.
- Under the scheme, 50% of the project cost for Greenfield EMC and 75% for Brownfield EMC is given as grant.
- So far, 19 Greenfield EMCs and 3 Brownfield EMC projects have been sanctioned with the project outlay of approximately €458 million, including approximately €187 billion from the Government of India as Grant-in-aid.

## Electronics Development Fund (EDF):

- EDF is set up as a “Fund of Funds” to participate in professionally managed “Daughter Funds” which provide risk capital to companies developing new technologies in the area of Electronics, Nano-electronics and Information Technology (IT).
- List of Daughter Funds of EDF along with their Status regarding Fresh Investments is **available [here>>](#)**

## Scheme for Promotion of Electronic Components and Semiconductors (SPECS) notified by Government of India on April 01, 2020:

- to strengthen the electronics manufacturing ecosystem
- To provide financial incentive of 25% on capital expenditure for the manufacturing of Electronics goods that comprise downstream value chain of electronic products.

## Five-year roadmap for electronics sector in India: released by MEITY

- It provides a year-wise break-up and production projections for the various products that will lead India’s transformation into a ~€256 billion electronics manufacturing powerhouse, from the current ~€64 billion.



# Standardization



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# Bureau of Indian Standards (BIS)

## Electro-technical division council (ETD):

- **ETD 28: Solar Photovoltaic Energy Systems:** National mirror committee of IEC TC-82 (P)
- **ETD13: Equipment for Electrical Energy Measurement and Load Control (Smart Meter):** National mirror committee of IEC TC-13 (P)
- **ETD 25-Lifts, Escalators and Moving Walks:**
  - To prepare standards and codes of practice for electrically operated lifts and escalators, including equipment and components. ETD 25 is national mirror committee of ISO TC- 178 (P).
- **ETD 47-Railway Electric Traction Equipment: National mirror committee of IEC TC-9 (O):**
  - preparing Indian Standards for the railways field which includes rolling stock, fixed installations, management systems (including communication, signalling and processing systems) for railway operation, their interfaces and their ecological environment.
- **ETD 46: Grid Integration**
  - preparing standards in the field of Grid Integration comprising of LT (ON Grid, Off Grid and Hybrid with and without storage), HT and EHT for all capacities.
- **ETD 50 – LVDC Power Distribution System:**
  - National mirror committee of IEC TC-SyC LVDC (P): SyC LVDC Low Voltage Direct Current and Low Voltage Direct Current for Electricity Access.
- **ETD 51-Electrotechnology in Mobility (National mirror committee of IEC TC-69 (P)):**
  - preparing Indian Standards for electrotechnical aspects of totally or partly electrically propelled road vehicles.



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# Bureau of Indian Standards (BIS)

## Electronics and Information Technology division council (LITDC):

- **LITD 10: Power system Control and associated Communications:** To prepare Indian Standards relating to: a) Power system control equipment and systems b) Distribution Management System c) Supervisory Control and Data Acquisition d) Distribution automation, **Smart Grid**, tele-protection and associated communications used in planning, operation and maintenance of power systems.
  - It is national mirror committee of IEC TC- 57 (P): Power systems management and associated information exchange ;IEC TC- SC-PC 118 (P): Smart Grid User Interface.
  - It has published over [70 standards](#) including:
    - **IS 16334 : 2015: Power system communications - Interoperability - Guidelines**
    - **IS 16335 : 2015: Power control systems - Security requirements**



# Telecommunication Engineering Center (TEC)

- TEC released a technical report titled “[M2M Enablement in Power Sector](#)” in May 2015 to introduce the need of M2M communication in the power sector and identified use cases this sector which include
  - smart metering,
  - Supervisory Control and Data Acquisition (SCADA),
  - Wide Area Monitoring System (WAMS),
  - Electric Vehicles,
  - Distributed Generation,
  - Energy Storage,
  - Microgrids and so on
- TEC is also working on draft document on “IoT and 5G applications in Smart Grid”



# Conclusion

- In India, Electrical Power Equipment Sector and Electronics Sector including Consumer Electronics are witnessing a major transformation in respect of demand growth, energy mix and market operations.
- The power industry's future in India is bright, and sustained economic growth continues to drive electricity demand in India.
- In order to reduce AT&C losses in T&D, smart meter and smart grid are being implemented by Government
- Government is focusing more on renewable energy generation as it has targeted to achieve 175GW renewable energy installed capacity by 2022 and committed to achieving 500 GW of installed electricity capacity from non-fossil fuel sources by the year 2030.
- As technologies continue to evolve, Indian Consumer Electronics sector is at the threshold of a decisive phase and the mantra of the industry today is convergence - whether of technologies or products or markets.
- National Electronics Policy and other schemes such as PLI scheme, Make in India, Modified Special Incentive Package Scheme (M-SIPS) and Electronic Development Fund (EDF) etc. are fueling the growth of sector.
- Government of India has started work on identifying and formalizing standards for implementing new emerging technologies such as Smart Grid, Smart Meter, 5G, AI, IoT/M2M, Blockchain etc. in collaboration with global SDOs.



thank you!

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