

EXECUTIVE SUMMARY

India is presently one of the fastest growing economy in the World and currently, it is the fifth largest economy in the World; and it is poised to become the third largest economy by 2030. This will only be possible if there is sufficient electricity to power this growth. It is essential that generation capacity, transmission capacity and distribution capacity are added at a pace matching the growth in demand- and in fact slightly ahead of the demand; so that the shortage of electricity does not slow down growth. Resource Adequacy Planning Guidelines have already been issued by Ministry of Power for distribution companies. Compliance to the Resource Adequacy Norms and Guidelines shall ensure that DISCOMs tie up sufficient capacity to meet the demand of the area they are licensed to serve. Further, Rights of Electricity Consumers Rules, 2020 also prescribe payment of compensation to consumers for avoidable load shedding.

Government of India has historically played a leading role in providing for energy needs of the nation. To liberalize the development of power sector, the Government brought the Electricity Act into force in June, 2003. It replaces the three existing legislations namely, Indian Electricity Act, 1910, the Electricity (Supply) Act 1948 and Electricity Regulatory Commission Act, 1998. The Electricity Act 2003 consolidates laws relating to generation, transmission, distribution, trading and use of electricity to ensure development of electricity industry, promoting competition therein, protecting interest of consumers, supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies etc.

Under the Indian Constitution, power is a concurrent subject and as per IE Act 2003, the distribution of electricity is a licensed activity. Hence, the responsibility for distribution and supply of 24x7 reliable & quality power to all consumers within the licensed area rests with the respective distribution utility. However, Government of India provides assistance to States by allocation of power from Central Generating Stations, establishment of Inter States Transmission system and providing funding for distribution infrastructure under various Central Sector / centrally sponsored schemes (like IPDS, DDUGJY, PSDF, Saubhagya, RDSS, etc.) for improving the distribution sector.

Power distribution is the final and most crucial link in the electricity supply value chain which is directly connected to the consumers. However, distribution sector is facing various challenges like unreliable power supply, high AT&C losses, old and overloaded network, low

cost recovery, low consumer satisfaction, etc. resulting poor financial health of Discoms and distribution companies are not able to undertake corresponding investments in infrastructure augmentation. Recently in last few year, the distribution sector has received greater attention and various reforms measures/ Rules have been notified by Ministry of Power for improving financial viability of distribution utilities and equipping them to provide 24x7 reliable & quality power to consumer. Several initiatives have also been introduced to bring down the Aggregate Technical and Commercial (AT&C) losses along within the definitive regulatory framework. Recently, Govt. has launched RDSS scheme with the aim to improve the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient distribution Sector. The Scheme aims to reduce the AT&C losses to Pan-India levels of 12-15% and reduction of ACS - ARR gap to zero by 2024-25. The Scheme has an outlay of Rs.3,03,758 crores for over 5 years i.e FY 2021-22 to FY 2025-26, with an estimated GBS from Central Government of Rs. 97,631.

Realizing the importance of the requirement of Distribution infrastructure for meeting the load up to 2030, CEA in consultation with distribution utilities prepared the Distribution Perspective Plan upto 2029-30 based on the information received from the Discoms. This Plan has included the Discom wise and All India level Distribution infrastructure planned by discoms to meet the projected demand by 2029-30. The best practices being followed by the Discoms for management of distribution system to provide reliable and quality power to consumer along with more consumer satisfaction have also been included in the respective chapters. The details of the new technologies available for introduction of Smart Distribution and a chapter on Capacity Building for distribution utilities have also been included for guidance of the distribution utilities.

Although, the development of distribution infrastructure is an evolving process and the actual requirement generally depend on the field conditions, however, the present distribution perspective plan would provide a broad picture of the distribution infrastructure plans of discoms up to 2030.

The DPP 2030 has included the utility wise & All India projected plans for:

1. Distribution Infrastructure

- Sub Stations (66/33/22 kV)- Nos, MVA
- Feeders(66/33/22 kV) - Nos, Ckm
- 11 KV Feeders – Nos , Ckm
- Capacitor banks- Nos, MVAr
- Distribution Transformers- Nos, MVA
- LT Feeders (415V, 240V)- Nos., CKm

- 2. AT&C loss Reduction trajectory till 2030**
- 3. Consumer Metering status and Consumer Growth**
- 4. Estimated Fund Requirement (Requirement, availability)**

DPP 2030 has also included the following Chapters :

1. Best Practices adopted by Discoms

- Operation & Maintenance
- System Capacity enhancement & Resilience
- Demand side Management
- Improving Tariff Structure
- Improving Human Resource
- Customer Services
- Improving Metering
- Loss reduction and Theft control
- Improving Safety
- Adoption of New Technology
- Cyber Security

2. Smart Distribution system

- Advanced Metering Infrastructure (AMI)
- Supervisory Control and Data Acquisition (SCADA) – Existing & Planned
- Mini SCADA - Real Time Data Acquisition System (RTDAS)- existing & Planned
- Distribution Management System(DMS)
- Advanced Distribution Management System (ADMS)
- Geographical Information System (GIS)
- Customer Relationship Management(CRM)
- Outage Management System (OMS)
- Demand Response(DR)
- Enterprise Resource Planning (ERP)
- Distribution Transformer Monitoring System (DTMS)
- Smart Street Lights (with noise and pollution sensors)
- Smart Battery Storage system
- Smart Micro Grid

- Home Automation System / Smart Homes
- Smart EV Charging Stations

3. Capacity Building for Distribution Utilities

- Capacity Building Approach
- Various Stages in Capacity Building
- Organization Structure of a Discom
- Various Programs for Training of Discom Personnel
- Recognition of Training Institute by CEA
- Basic Structure of Curriculum for O&M of Distribution system
- Distribution Sector Capacity Building program

SUMMARY OF DISTRIBUTION INFRASTRUCTURE PLANNED (AS ON MARCH 2022 AND MARCH 2030)

Sr	Description	Unit	March-22	March-30	%age Increase
1	Substation Count (66/33/22 kV)	<i>Nos</i>	39,965	52,157	31%
2	Substation Capacity (66/33/22 kV)	<i>MVA</i>	48,2810	62,4332	29%
3	Feeders (66/33/22kV) Count	<i>No</i>	36,804	54,639	48%
4	Feeders (66/33/22kV) Length	<i>CKM</i>	58,9304	77,7994	32%
5	Feeders (11kV) Nos	<i>Nos</i>	230979	323899	40%
6	Feeders (11kV) Length	<i>CKM</i>	49,35,279	59,03,782	20%
7	Distribution Transformer(DT) count	<i>Nos</i>	1,46,74,261	1,93,32,115	32%
8	Distribution Transformer(DT)	<i>MVA</i>	6,89,192	9,27,656	35%
9	LT Feeders (1-Ph & 3 Ph)	<i>CKM</i>	79,45,758	9774634	23%
10	Capacitor Bank	<i>MVAR</i>	59,255	1,05,209	78%
11	Consumers (in Crores)	<i>Nos</i>	33	52	58%

For converting these plans/ projections into ground reality, a coordinated effort is required from all stakeholders especially the policy makers i.e. Discoms, State Govt., Central Govt, State Regulators, Industry etc. The electrical manufacturing sector is set to come forward to supply the requisite material & equipment under the aegis of “Make In India” as per requirement.

Estimated Funds requirement for Distribution Infrastructure upgradation

Investment Required from 2022-27 in Rs lakh Crore	Total Investment available with the Discom from various sources for period 2022-27 (Rs lakh Cr.) including RDSS	Investment Required from 2027-30 in Rs lakh Crore	Total Investment Required from 2022-30 in Rs lakh Crore	% of required investment already sanctioned upto 2027 under RDSS and other schemes
Rs 4.28	Rs 1.89	Rs 2.86	Rs 7.42	44.11 %

Projected AT&C loss Trajectory

Range	As on 31.03.2022 (PFC-2021-22 data)	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Loss>25	23	15	8	4	3	1	0	0	0
25<=Loss<20	3	10	11	4	2	4	3	1	1
20<=Loss<15	7	13	15	15	18	11	11	11	7
Loss<=15	38	33	37	48	48	55	57	59	63
Total	71	71	71	71	71	71	71	71	71

AT&C loss is an apt indicator of the utility’s Operational performance. With more utilities aggressively driving towards sub 10%, the distribution sector is set to move to the higher orbits of performance growth & sustainability by 2030. The introduction of ICT including Smart Metering and other new technologies along with network addition / optimization would also help Discoms to further curtail the losses.