



ELECTRICITY DISTRIBUTION SYSTEM IN INDIA

The Indian power sector is segmented mainly into Generation, Transmission, and Distribution sectors. The Distribution sector involves Distribution Companies (Discoms) responsible for the supply of electricity to the Domestic, Industrial, Commercial and Agriculture Consumers. In Power Sector, the distribution system is a weak link due to high Aggregate Technical & Commercial (AT&C) losses, erroneous metering, poor revenue realisation, and inadequate infrastructure maintenance.

All these factors have contributed to the poor financial health of the distribution utilities. As mandated in the Indian Electricity Act-2003, the State Electricity Boards (SEBs) were unbundled for independently handling Transmission, Generation & Distribution sectors and setting up the Central and State Electricity Regulatory Commissions. At present, 58 independent Discoms operating in India excludes SEBs, where the Generation, Transmission, and Distribution sectors are yet to be unbundled.

Distribution losses in India are around 35-40 %, which is very high compared to the Global standards. In 2015, to reduce distribution losses from 35%-45% to 15%, Government of India (GoI) launched UDAY scheme.

In May/Sept 2020, to revive the health of ailing Discoms a significant financial intervention by GOI of Rs 90,000 Cr was announced, which is expected to be enhanced to Rs 1,20,000 Cr through Power Finance Corporation (PFC) and Rural Electrification Corporation (REC)¹. These initiatives will improve the financial health and operational efficiency of the Discoms.

Over the last 15 to 20 years, the Distribution sector's outlook has vastly improved due to various Regulations and Schemes introduced by the Central and State Governments. In the coming years, consumers' preference towards uninterrupted high-quality power supply and fast phase technological developments will drive the distribution sector's growth to new heights.

TCE with its vast experience in the power industry is all poised to take up the challenges and provide solutions to Discoms to improve the overall performance in the areas such as Due diligence, AT&C loss minimisation studies, smart metering infrastructure, digitisation, utility-scale battery energy storage system, renewable integration and IT-enabled services to the distribution utilities across the country.

1 ET Energy World (13 May 2020) and Press Trust of India (13 Sep 2020)

Government Policies and Regulations

Since independence, both Central and State governments have supported electrical sector with various schemes and initiatives to improve the overall health of Discoms but with limited success. This has resulted in a resource drain on the Indian economy.

The Electricity Act-2003, National Electricity Policy-2005 and National Tariff Policy-2006 have vastly helped improve the Indian power sector. The key initiatives/ programs in Distribution sectors such as Accelerated Power Development Reforms Program (APDRP)2002 and Restructured Accelerated Power Development and Reforms Program (R-APDRP) 2008 have primarily focused on improving necessary infrastructure, and IT-enabled services of Discoms.

National Smart Grid Mission (NSGM) 2012, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)2014, Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA) 2017, Ujwal Discom Assurance Yojana) scheme – (UDAY) 2015 are focused on meeting the goal of “Power to All”. All the schemes aim to ensure availability of 24x7 power at an affordable price and improve the financial health and operational efficiency of Discom.

In 2020, to revive the health of ailing Discoms a significant financial intervention by GOI, Rs 1,20,000 Cr would be infused through PFC and REC. The Draft Amendment Bill proposes Direct Benefit Transfer (DBT) for the economic viability of Discoms. Now, State Govt. can directly pay to end consumer under Direct Benefit Transfer and linking smart meters to provide DBT to consumers.

The government is continuously evolving various policies and regulations to bring commercial viability for Discoms. As in Delhi and Orissa's case, the Private players are encouraged through multiple models such as Public Private Participation (PPP).

In Maharashtra, Madhya Pradesh and Uttar Pradesh input-based distribution franchisee models are being considered. In May 2020, Gol announced that the Centre would privatise the power distribution companies in Union Territories (UT). This will bring private sector investment and result in improved operational efficiency, better service to consumers and financial health of Discoms in UTs.

Current Challenges

Aggregate Technical & Commercial (AT&C) losses in Distribution are as high as 35%, which are much higher than those in any developed country. Increasing share of renewable generations in the grid has impacted the traditional approach of Distribution system operation.

The power generated from wind and solar plants is intermittent in nature and difficult to schedule firm power. To take care of these variations, distribution utilities will tie-up with additional peaking generating stations with high variable cost.

The use of gas-based peaking generating stations for balancing purpose is uneconomical as it increases the power purchase cost of distribution licensees.

The decentralised market structure provides individual distribution entities to be more responsive in complying with grid discipline rules of balancing their generation and demand. The regulation has mandated volume limits on over drawl and under-drawl of electricity.

Distribution utilities are severely affected due to these grid discipline rules and pay a hefty penalty. In the coming decade, the need to modernise the grid will help the utilities meet the challenge of handling projected energy needs while maintaining a robust and resilient electricity delivery system.

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TCE Role in Electrical Distribution System in India

With its vast experience in Power Industry, TCE is all poised to take the challenge and provide solutions to Discoms across the country.



Focused Areas of Distribution System

Due Diligence

- + *Privatisation of DISCOM*
- + *Firming Management level Investment decision by developing Utility level SWOT analysis*

AT&C Loss Minimisation

- + *Various Government initiatives are taken to improve the health of Distribution system*
- + *Most of the Indian utilities have high AT&C losses*

Grid Automation

- + *Improved system performance*
- + *Reduced dependence on HR*

Smart Grids / Smart Meters

- + *Various Government initiatives including smart cities*
- + *Moving towards Digitalisation*

BESS

- + *Managing a renewable mix*
- + *Reducing Grid Penalties and enabling flexible operation*

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