Action plan on AT&C loss reduction as part of power sector reforms

Rajasthan Discoms

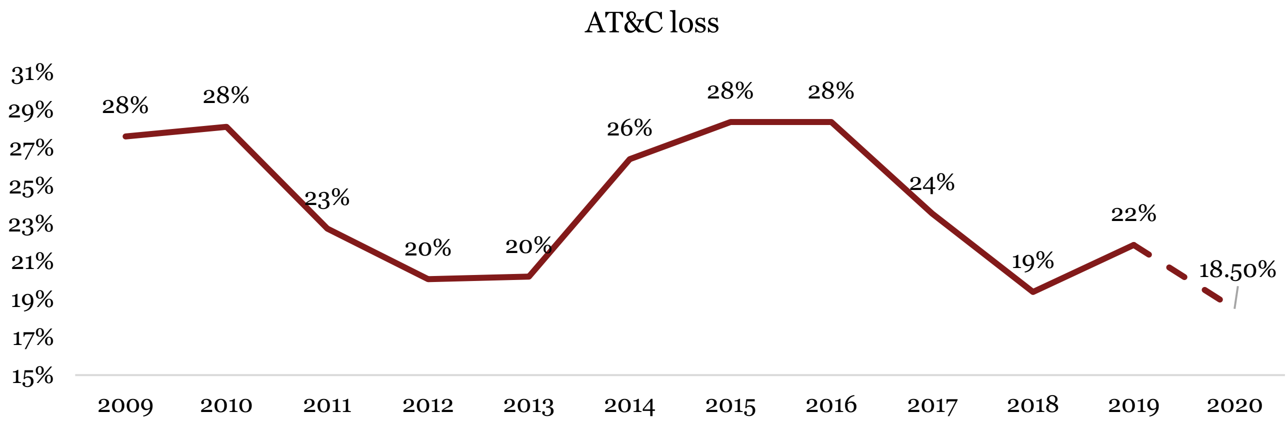
June 2020

Table of Contents

1. Introduction

The State of Rajasthan has been amongst the forerunners in initiating various reforms in the power sector which can be gauged from the fact that the Government of Rajasthan brought about a slew of reforms from the late 90's culminating in implementation of Power Sector Reforms Program. The reforms in the power sector aimed to facilitate and attract investments, bring about improvements in the efficiency of delivery system and create an environment for growth for the overall benefit of the people of the state. As a result of comprehensive reforms, the power sector in the state of Rajasthan has made significant progress over the last decade in terms of increased generation capacity and strengthening of network infrastructure leading to an improved power supply position. Most consumers are already being provided 23-24 hours of average daily supply and the state has completed 100% household electrification.

The Discoms understand importance of reducing the AT&C losses in order to ensure that the state power sector remains viable. Discom have already undertaken several steps for reducing the losses in the past and **have been able to reduce AT&C losses from peak of 28% in 2016 to 22% in 2019**. Losses at the end of March 2020 are expected to be around 18.50%.



Financial position of Discoms

Prior to UDAY, the Discoms were in a precarious financial position. With a revenue deficit of Rs 11,241 Cr in FY 2015-16, the accumulated losses had reached to the level of approximately Rs. 100,000 Crores. Due to relief from the interest servicing cost due to UDAY, Discoms managed to reduce the financial loss to Rs 4,816 Cr in FY 2016-17.

However, post UDAY, the financial position of Discoms has been stressed due to the following reasons:

- Interest charged on UDAY loans by GoR from 2017-18
- No tariff hike claimed by Discoms in FY 2018-19 due to non-envisaged interest cost burden
- Non-achievement of AT&C losses by Discoms
- Non-receipt of Tariff Subsidy (Agriculture) from the GoR including FSA
- Non-issuance of Bonds for residual debt (25%) resulting in higher than envisaged interest cost
- Non-funding of losses of Discom as per UDAY MoU by GoR
- Insufficient equity from GoR for capex; Results in less than ideal debt-equity ratio and Regulatory disallowance

Due to these reasons the discoms incurred a loss of Rs. 9,393 Cr in FY 2018-19 with total accumulated losses reaching Rs 89,854 Cr.

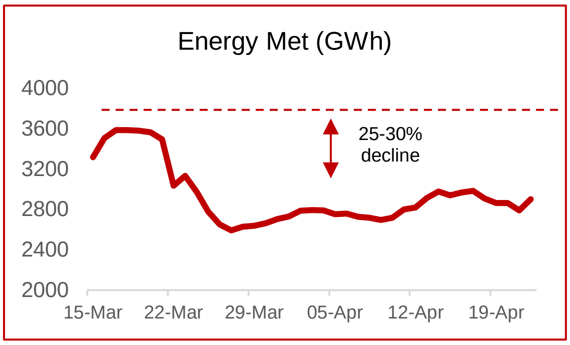
Such loss with restriction on working capital loans under UDAY have led to outstanding with generators, primarily state gencos.

Particulars as on 14.05.2020 (in Rs Cr)	Principal	LPS	Total	%
CPSE genco	1615	75	1690	5%
CPSE transco	744	25	769	2%
IPPs	2330	142	2471	7%
RE	1647	185	1833	5%
State Genco	16079	7197	23275	69%
State Transco	3587	155	3742	11%
Total	**26002**	**7778**	**33780**	**100%**

GoI Schemes under 'Aatma Nirbhar Bharat'

Impact of COVID-19

Towards the end of March 2020, the pandemic struck the country forcing the Central Government to announce a nation-wide lockdown which has led to shut down of all but essential commercial activities across the country. Consequently, the electricity demand from Commercial and Industrial (C&I) categories and railways (due to suspension of passenger trains) has reduced significantly.



Source: POSOCO, PwC Analysis

According to the data published by Power System Operation Corporation of India (POSOCO), there has been a compression of daily power demand to the tune of 25% to 30% due to Covid in the country, primarily driven by closure of C&I establishments which constitute 50% of the demand. Due to the reduced demand (approx. by 800 MUs per day), the Utilities in the country are staring at a net revenue loss of at least Rs 16,000 Cr (considering a tariff of Rs 8/ unit and savings in power procurement costs (variable charges) of Rs 3/ unit) for a period from 23 Mar '20 till 3rd May '20.

Further, besides the revenue loss due to reduction in demand, the Discoms in the country will also be negatively impacted due to the factors mentioned below:

1. Waiver of fixed charges for C&I consumers during the COVID period announced by some states such as Gujarat, Haryana, Karnataka, Andhra Pradesh, Punjab etc.;
2. Deferment of fixed and energy charges for agriculture and domestic categories;
3. Deferment of fixed charges for C&I categories
4. Loss of cross-subsidy due to reduction in demand from subsidising categories (C&I);
5. Increase in sale to subsidised (Domestic) categories;
6. Meter reading on average basis instead of actual reading and delay in billing due to lock down;
7. Waiver of Late Payment Surcharge from consumers;
8. Exemption from disconnection in case of non-payment of bills by retail consumers during COVID period;
9. Poor cash collection due to closure of offline collection centres (As per a recent PwC survey of 25 Utilities, nearly 80% of the revenue collection is through offline mode);
10. Delay in subsidy due to stress on state budget and poor collection from Govt department.

The impact of COVID'19 will extend to the upstream entities, particularly generating stations, as discussed below:

1. Ministry of Power had directed the generators and transmission companies to continue supplying 24x7 power notwithstanding discoms' inability to pay.
2. Discoms are exploring the options to waive off the fixed/ capacity charges for the non-scheduled capacity by invoking the Force Majeure clauses given in the Power Purchase Agreements.

3. Rate of LPS, charged by generator for delay in payments by Discoms, has been reduced by the CERC in accordance with the direction given by the Central Government under section 107 of the Act. The SERCs are also issuing similar Orders.

The generators might get some relief due to non-insistence of advance payments for coal and railway freight by Coal companies and Railways but their cash flow will get significantly impaired.

To overcome some of the challenges due to COVID-19, the GoI announced a series of measures aimed at infusing liquidity into the Discoms such as the Rs 90,000 Cr long-term transition loans to the Discoms through PFC and REC to pay off the generator dues.

Additional borrowing beyond FRBM limit

The Government of India has provided the facility to state governments to borrow beyond the FRBM limit, i.e. 3% of the total SGDP. The additional borrowing is allowed upto 2% beyond the FRBM limit subject to the following conditions. 1% additional limit subject to 4 reform measures to be taken by state governments. The weightage of each reform measure is 0.25%, i.e., each reform measure would entail an additional borrowing limit of 0.25% beyond the FRBM limit.

The 4 reform measures are as follows:

a) Implementation of One Nation One Ration Card System
b) Ease of doing business reform
c) Urban Local body utility reforms
d) Power Sector Reforms

The remaining 1% additional limit shall be allowed on the basis of two installments of 0.5% each.

a) The first installment of 0.5% shall be provided immediately to all states unconditionally
b) The second installment of 0.5% shall be provided upon submission of undertaking by states to implement at least 3 out of the 4 reforms as mentioned above.

The power sector reforms, which carry 0.25% weightage, have been divided into three major activities that are as follows:

i. **AT&C loss reduction (**weightage of **0.05%**): the assessment of AT&C loss reduction shall be based on self-declaration by state government in January 2021.

ii. **Reduction in ACS-ARR gap (**weightage of **0.05%**): the assessment of ACS-ARR gap reduction shall be based on self-declaration by state government in January 2021. Further, in the calculation of ACS-ARR gap, the amounts remaining unpaid by State Government/local bodies shall be deducted from the revenue.

iii. **Introduction of Direct Benefit Transfer scheme for farmers (**weightage of **0.15%**): The state government should put in place a scheme whereby from the FY 2021-22, cash is transferred to the farmers through DBT instead of free electricity being provided to them. Whereas charges of the electricity are paid to the Discoms by farmers directly from the amounts given to them. To become eligible, the state should:

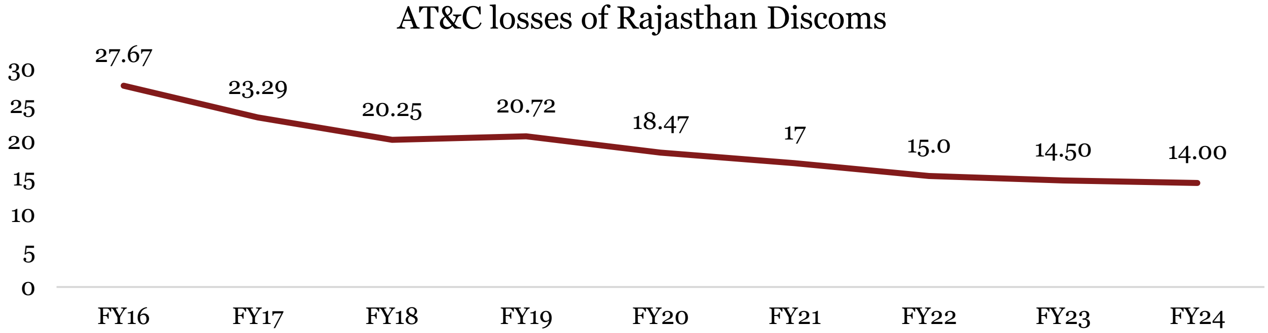
- Formulate the DBT scheme
- Implement the same at least in one district by 31st December 2020.

In order to avail the benefits of increase in FRBM limits, the Discoms have prepared an action plan for reducing AT&C losses, ACS- ARR Gap as well as introduce DBT which are detailed in the subsequent sections.

2. AT&C loss reduction

The Discoms are committed towards reduction of losses. Some of the measures taken over the years include implementing a performance monitoring and management system, 100% DT metering, AMR metering for high value consumers, feeder segregation etc. Loss reduction targets have been prepared at division/circle/zonal level and concerned officials have been made responsible for achieving the targets. At the same time, focused vigilance is being undertaken to reap maximum results.

The Present situation of losses of each Discom and Future targets till FY 2023-24 are attached as table below:



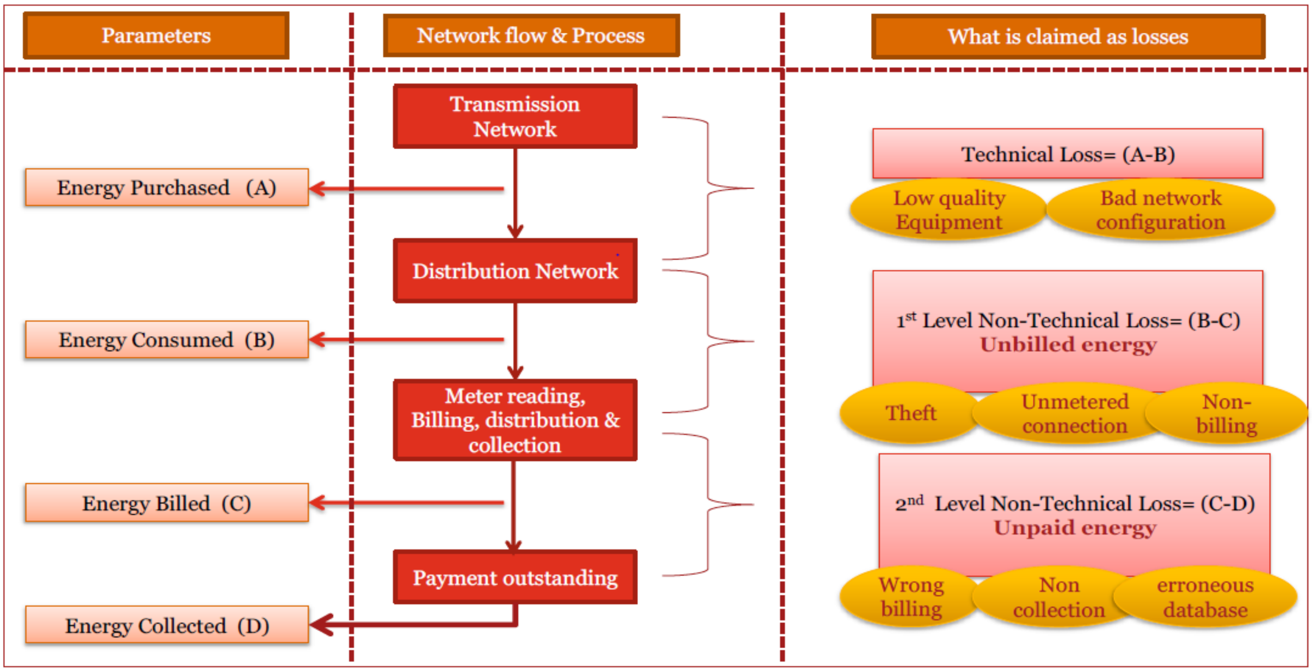
The losses occurred in the distribution system, from injection point to consumer metering, are defined as distribution losses. At a broad level, the distribution losses are calculated as per the following formula:

T&D losses = *Energy input in the Discom periphery – energy billed, or*

AT&C losses = *Energy input in the Discom periphery – energy collected*

The loss measurement diagram depicting various types of losses from the point of energy procured to the consumer-end point (also known as energy collection point) is as follows:

Figure 1: Diagram of Loss Measurement



Loss reduction measures to be taken can be categorized into three parts:

- Technical loss measures
- Commercial loss measures
- Other measures

A. Initiatives for Technical Loss Reduction:

a) Network enhancement

Technical losses are mostly due to loss at LT level. To reach 12% loss by FY 2025-26, Discoms plan to:

- Improve LT:HT ratio from current 0.46:1 (Deteriorated post DDUGJY & Saubhagya), Implement High Voltage Distribution System implementation, replacement of conductors etc.
- For consumer service line, non-armored cable will be replaced with armored cable
- DTR Load balancing: Post DT metering, Discoms shall correct balance load of Distribution Transformers by augmenting / adding their capacity in required areas

Reduction in technical loss by 3% over 3 years will result in annual saving of Rs 1500 Cr.

b) Feeder Segregation

- Agriculture consumers consume 40% of total energy among highest in the country
- Segregation of agriculture feeders from mixed feeders will ensure:
  - Uninterrupted block hour power supply to Agriculture Consumers
  - Uninterrupted 24 hours supply to rural domestic consumers
  - Avoid misuse/theft of single-phase supply by Agriculture consumers
  - Better system planning and load management leading to reduction in T&D Loss
- Scheme involves capital expenditure of Rs 6,900 Cr.

B. Initiatives for Commercial loss reduction

a) Vigilance

- The no. of checkings, FIRs, arrests had decreased in last few years
- As per Forum of regulator study, AT&C loss in the state is due to high theft and lower collection efficiency
- Strict vigilance with theft detection and FIRs will reduce losses to 15% by FY 2020-21 which can be achieved by:
  - Massive drive by vigilance dept. to increase checking, assessment and arrests
  - Use of AB Cables with proper piercing insulating conductors
  - Removal of illegal transformers of the consumers
  - Data analytics-based vigilance
- **Small domestic consumer**: Average consumption of 44 unit/month
  - Consumers are artificially containing sales under 50 units by connecting parallel line to avail special tariff of Rs 3.85/unit and subsidy from GoR
  - Matching load with sales, Strict vigilance with theft detection and FIRs will deter such consumers & increase sales
  - Increasing fixed charges and simultaneously decreasing energy charges will demotivate such consumers to tamper the meter
  - If actual sales are higher by 10-20 units then Discoms could generate at least additional yearly revenue of Rs 350 Cr.
- **Achieving 15% loss reduction in FY 2021-22 through strict vigilance will result in annual saving of Rs 1500 Cr.**

b) *Energy Accounting and Auditing*

- Discoms have done 100% feeder metering and consumer indexing
- Discoms needs to further correctly estimate feeder wise losses and consumer indexing which is incorrectly reflecting in Bijli Prabandh application
- Post DT metering, Discoms needs to estimate Voltage wise losses and auditing at DT, 11 kv and 33 kv
- Timely completion of third party energy audit with submission of compliances from previous report
- Discoms will also do DT level energy audit in RAPDRP towns and carry out Smart metering on 80,000 distribution transformer for energy audit

c) *Replacement of defective meters*

- 33% agriculture meter are defective and 4.5% rural single phase meters are defective in the state. Defective meter result in incorrect estimation of sales at consumer level
- Discoms shall replace defective meters in FY 2020-21 and FY 2021-22
- Smart meter on agriculture consumers will help in assessing defective meters helping in replacing defective meter within 10 days going forward
- This will lead to accurate reading of consumers with higher consumption
- Accurate reading will also reduce subsidy disputes with GoR (6% higher AT&C loss based on actual subsidy received)

d) *Smart metering*

- Installation of Prepaid smart meters will help in improving billing efficiency and assist in undertaking data analytics
- Benefits of smart metering includes:
    - On time and accurate billing and reduced manpower in Metering & billing
    - Reduced operation expenditure
    - Real time Monitoring of AT&C loss
    - Better collection efficiency through prepaid meters will result in annual saving of Rs 350 Cr.
- Scheme involves capital expenditure of Rs 3,600 Cr.

e) *AMR Metering*

- AMR meters installed on 48% industrial consumers and 58% DTs of which only 9% and 13% AMR working currently
- Discoms will install AMR/ smart meter on all Industrial consumers and DTs
- This will minimize human intervention and improve accuracy of high value consumers
- Instant meter reading collection and bill generation will result in reducing payment cycle by 10 days and save working capital of Rs 400 Cr. every month

f) *Consumer awareness program*

- Remunerative theft reporting consumer incentive scheme
- Social media (WhatsApp, Facebook, Twitter), Advertisements and in-person awareness camps on theft prevention, impact of theft of tariff and initiatives like loss-linked load shedding

g) *Monthly collection efficiency*

- Collection efficiency ranges between 80% - 90% during first 8 months and increases beyond 100% during last two months
- Discoms will shift focus from yearly collection efficiency to monthly collection efficiency (95% in rural and 98% in urban) for better realization
- This will result in additional monthly working capital of Rs 500 Cr with Discoms

h) *Recovery from TDC and PDC consumer*

- One-time settlement from PDC consumers by announcing waiver of interest/penalty and portion of dues
- 100% revenue recovery with 100% TDC/PDC consumer checking & identification/marking of doubtful consumers

- Pro-active disconnection of meters of TDC consumers after 6 months
- Focused arear recovery drives targeting high value TDC and PDC consumers
- Discoms can recover Rs 1500 Cr. over 1 to 3 years through such waiver scheme

i) Correct declaration of Connected load

- Conduct drives to match load with consumption to identify consumers under- declaring load

C. Other measures

a) Tariff rationalization of agriculture consumers

- 5% of revenue from agriculture consumers comes from fixed charges while 95% comes from energy charges. Whereas 61% cost of the Discoms are fixed cost and only 39% are energy cost
- States like Gujarat and Bihar earn 79% and 42% of the revenue from fixed charges
- Discoms plan to rationalize such disparity in tariffs going forwards
- This will result in stable revenue to Discoms, reduce case of burnt transformers and defective meters in high energy consumption areas resulting in loss reduction

b) Public Private Partnership – Distribution franchisee

- Discoms have given input plus investment based DF in Kota, Bharatpur, Ajmer city and Bikaner city for 20 years
- DFs have been able to reduce AT&C losses by 7.9% within 3 to 4 years
- Giving DF in division like Nagaur (58%), JPDC (33%), Bandikui (47%), Bansur (41%) will annually save Rs 900 Cr.

c) PM KUSUM Scheme

- Implementation under Component A & C will reduce distribution loss of Discoms because power will be locally consumed
- Discoms will be able to save Rs 1,235 Cr in power purchase cost and average reduction of 0.38% in distribution loss over 3 years

Benchmarking with Similar Utilities

At all the steps mentioned above, the loss levels and the strategies to reduce them will be benchmarked with loss reduction journey of a similar utility using Why-Why analysis or 5W1H analysis.

The Discoms plan to undertake benchmarking with Utilities based on ownership structure (private or public), regions, consumer mix, demographics etc.