## Smart Meter Monthly Billing and Settlement Understanding with Prepaid System (MDMS)

- After Smart Meter installation, each month meter reading as on 1st day of that month is sent withall Billing Parameters from MDMS to Billing System for monthly invoicing. The Billing Parameters may be as follows-
    - Units Consumed in Kwh/Kvah for period - Smart meter installation date / 1st day of previous month to 1st day of the current month.
    - Recorded demand in KW/KVA- Max demand availed by the consumer in last month.
    - Average Power factor of last month
    - Average Supply hours for Last month (No value sent if smart meter installed in middle of month)
    - Export Units in Kwh/Kvah (In net-metering only)
- This meter reading are sent to Billing system normally after Schedule date + 2 day of respective MRU but reading date and readings, both are always of 1st day of the month.
- After Bill generation for Smart Prepaid meter, actual calculation of all relevant charges is done and the calculated charges are compared with that of deduction made at MDMS during the last month. Any difference in deduction is credited / debited in MDMS on the date invoice detail is sent to MDMS.
- The daily deduction at MDMS pre-paid system is purely provisional and monthly settled with actual invoicing done at Billing system. The pre-paid system is meant for consumers to give them there current energy utilization detail and a rough idea of there balance/dues as on date. For surrender of supply and any legal purposes, the details at Billing system is considerable and final.
- This document is meant to understand this settlement / Credit-Debit method between DISCOM Billing System and Prepaid MDMS. The details are as below-

### First Bill after Smart Meter Installation :-

**A. Amount Payable within due date is positive**

a. An installment amount is calculated and sent to MDMS

b. This arrear installment deduction starts alongwith energy and fixed charges on daily basis.

c. This deduction continues till next billing until the Amount Payable within due date becomes negative.

**B.** Amount Payable within due date is negative

a. Balance as on 1st day of the month is calculated at Billing side by deducting all payments made after 1st day of that month from Amount Payable within due date. Say amount is 'X' (Change the sign ie from + to – or vice-versa)

b. Take closing balance as on 1st day of the month from Prepaid system ie MDMS. Say its 'Y'

c. Calculate X-Y

d. Deduct the difference from the present balance in MDMS on the day invoice is sentto MDMS.

e. Now even next bill Amount Payable within due date become positive, the sameformulae will apply and no installment plan is applicable once bill is in negative.

## Second or subsequent Bill after Smart Meter Installation for case 'A' :-

### C. Amount Payable within due date is still positive

a. Take current total of the generated bill 'A' and installment 'B'

b. Calculate no of days installment deducted – after second bill, its equal to bill days. In second bill its reading date minus Previous invoice date. Say its 'C'

c. Calculate A+(B*C)= 'X'

d. Take sum of all deductions made in MDMS between 1st day of month – bill days (max 3 months )='Y'

e. The difference Y-X is deducted from balance

### D. Amount Payable within due date is negative

Process as stated in B above.

# ABSTRACT

The goal of this project, "Electricity Consumption Analysis," is to use cutting-edge data analytics tools to provide a thorough analysis of patterns in power usage. Utility businesses like South Bihar electricity Distribution Company Limited (SBPDCL) need to identify consumption patterns because of the increasing demand for energy efficiency and the necessity to optimize electricity distribution.

The research makes use of past consumption information gathered from smart meters for residential, commercial, and industrial customers, among other consumer categories. The project's main goals are to spot patterns and abnormalities in power use, forecast future consumption, and offer practical advice for more effective resource allocation and demand management.

The project processes and analyzes several CSV files providing comprehensive consumption records using Python and a number of data analysis tools. Preprocessing of the data, time-series analysis, and machine learning models for consumption prediction are important analytical techniques used. Clear and meaningful data representation is made possible by the use of visualization tools such as Matplotlib and Plotly, which are used to create intuitive graphs and charts.

The analysis's findings draw attention to the distribution network's possible inefficiencies as well as seasonal fluctuations and peak use times. In addition, the project uses Power BI to create an intuitive dashboard that shows important metrics and trends for stakeholders to easily understand and make decisions.

In conclusion, this initiative contributes to a better knowledge of trends in electricity usage and gives SBPDCL useful information for enhancing operational effectiveness, optimizing energy distribution, and making future infrastructure investment plans. The methods and conclusions offered might be used as a starting point for continued initiatives to accomplish effective and sustainable energy management.

TABLE OF CONTENTS