Standard Operating Procedure (SOP)

Energy Accounting and Billing of Open Access and Banking Consumers

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1. Objective

To standardize the processing, adjustment, and billing of Open Access Consumers using automated data (Actual Meter, Open Access and Banking energy) flow from UPSLDC's EASS through MDM (Inventive MDM) and into the Discom's CCB/RMS billing platform, ensuring UPERC compliance and minimization of consumer grievances.

2. Background

Open Access (OA) consumers use renewable energy through Open Access and banking mechanisms. UPSLDC provides energy account data in kWh format. Since Discom billing is based on kVAh and TOD / Banking slabs, this raw data needs processing, PF consideration and charge adjustment before being usable in RMS/CCB.

3. Regulatory References

- UPERC Open Access Regulations, 2019 and its amendments / New regulations issued by UPERC thereafter
- UPERC (Forecasting, Scheduling, Deviation Settlement and Related Matters for Solar and Wind Generating Sources) Regulations, 2018/ New regulations issued by UPERC thereafter.
- UPERC (Captive and Renewable Energy Generating Plants) Regulations (CRE), 2019 and its amendments / New regulations issued by UPERC thereafter.
- Central Electricity Authority (CEA) Metering Regulations (for metering standards and requirements).
- Notified Final Procedure for Scheduling, Dispatch & Energy Accounting 2012 issued by UPSLDC in accordance with Order dated 12.09.2011 passed by the U.P. Electricity Regulatory Commission in petition No.659/2010.
- Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022
- UPERC Tariff Orders (latest applicable)

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4. System Components

System	Role
UPSLDC (EASS)	1. Provides raw 15-min OA in kWh of Open Access Consumer (including Green Open Access of consumer) and Lead Green Energy Open Access Consumer 2. Provide raw 15-min Banking Injection Energy data in kWh (including Green Open Access of consumer) and Lead Green Energy Open Access Consumer 3. Provides raw 15-min banking withdrawn energy in kWh of Open Access Consumer (including Green Open Access of consumer) and Lead Green Energy Open Access Consumer
MDM (Inventive)	Processes raw data, applies losses/charges, maps to TODs
DISCOM RMS/CCB	Performs final reconciliation and billing in kVAh

5. Roles and Responsibilities

A. UPSLDC – EASS Output

- Shares block-wise energy data of OA consumer with consumer account ID along with banked energy (injection & withdrawn) on monthly basis.
- Classifies Open Access and banked energy (injection & withdrawn) separately.
- Shares applicable loss % (trans.) at injection points.
- Lead consumer data shall be allocated consumer wise on the basis of schedule. Lead consumer data shall be provided by SLDC with the bifurcation of all the consumer.
- UPPCL SE (energy account) shall share discom wise distribution loss on quarterly basis or as provided in tariff order.

B. MDM Middleware

- MDM shall collect data for Open access consumer and lead consumer alongwith associated consumers through API interface.
- Parses UPSLDC data and maps to UPERC TOD slots:

TOD Mapping Table

Season	TOD Slot	Time Range
Summer (Apr–Sep)	TOD-1	05:00–10:00
	TOD-2	10:00–19:00
	TOD-3	19:00–03:00
	TOD-4	03:00–05:00
Winter (Oct–Mar)	TOD-1	05:00–11:00
	TOD-2	11:00–17:00
	TOD-3	17:00–23:00
	TOD-4	23:00–05:00

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Sample Tables in which data is to be provided by MDM

TOD-Wise Banking Energy Adjustment Table (Example)

TOD Slot	Banked Energy Withdrawn (kWh)	Banking Charge (6% for solar*)	Trans. Loss (TL) (as applicable)	Dist. Loss (DL) (as applicable)	Net Banked Energy withdrawn for Adjustment (kWh)	PF (default 0.9)	Net Banked Energy withdrawn for Adjustment (kVAh)
A	B	C=B*6%	D=(B-C)*TL	E=(B-C-D)* DL	F= B-C-D-E	G (0.9)	H=F/G
TOD1							
TOD2							
TOD3							
TOD4							

* *The sample table shows Banking Charges for solar (6%). The table is true for other RE sources also such as Wind, Co-gen/Baggasse plants etc. where the Banking charges shall be as per UPERC Regulation(s).*

TOD-Wise Open Access Energy Adjustment Table (Example)

TOD Slot	OA Energy (kWh) after Trans. Losses	- Dist. Loss (as applicable*)	Net OA (kWh)	PF (Default (0.9)	Net OA for adjustment (kVAh)
[1]	[2]	[3]	[4]= [2]*(100-[3])%	[5]	[6]=[[4]/[5]
TOD-1					
TOD-2					
TOD-3					
TOD-4					
Total					

* *As per SOP Point no. 5*

TOD-Wise Total Energy Adjustment (Open Access & Banking) Table (Example)

TOD Slot	Net OA for adjustment (kVAh)	Net Banked Energy withdrawn for Adjustment (kVAh)	Cumulative Energy for Adjustment (kVah)
[1]	[2]	[3]	[4]=[2]+[3]
TOD-1			
TOD-2			
TOD-3			
TOD-4			
Total			

Note- This TOD wise cumulative energy adjustment shall be adjusted in the TOD wise actual drawl of the consumer

- MDM shall provide the maximum demand to be charged by DISCOM from the block wise data. This block wise data shall be calculated from block wise actual meter demand data after adjusting the block wise cumulative demand data for adjustment.
- MDM shall calculate the unutilized banked energy data on monthly basis or quarterly basis as the case be.

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- MDM shall provide the data of Net Unitized Energy of previous month on monthly basis or data of Net Unitized Energy older than 02 quarter in the first month of each quarter.

Sample Tables in which data is to be provided by MDM

Monthly/Quarterly Unutilized Banked Energy Adjustment Table (Example)

Month/Quarter	Injected Banked Energy (kWh)	Banked Energy Withdrawn (kWh)	Unutilized Banked Energy (Monthly/Older than 02 quarter) (kWh)	Banking Charge (6% for solar*) (kWh)	Net Unutilized Banked Energy (kWh)
A	B	C	D=B-C	E=D*6%	F=D-E

** The sample table shows Banking Charges for solar (6%). The table is true for other RE sources also such as Wind, Co-gen/Baggasse plants etc. where the Banking charges shall be as per UPERC Regulation(s).*

C. DISCOM – RMS / CCB System

- Receives from MDM:
  - TOD-wise **total Energy for Adjustment** in kVAh
  - TOD-wise consumer meter import (kVAh)
  - Maximum demand to be charged by DISCOM
  - Net Unutilized Banked Energy.

  Performs:
  - TOD-wise energy matching
  - Billing as per applicable TOD tariff
  - Demand charge computation
  - Net unutilized banked energy settlement as per CRE Regulation' 2019 (as amended)

6. Monthly/Q+2 Banking Expiry Handling

- MDM maintains a monthly/quarter-wise ledger of unitized banked energy.
- At month-end:.
  - Shares Net unutilized banked energy quantum with RMS monthly or quarterly as applicable.

RMS calculates settlement value of the expired banked energy as per the applicable tariff regulations/order and include it in the consumer bill.

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7. Exception Handling & Validation

- MDM shall validate for:
  - Negative TOD values
    - As per applicable Open Access Regulations
    - As per Procedures for scheduling, despatch, energy accounting, UI accounting & settlement system of Open access transactions as per UPERC Order dt 12.9.2011 passed in Petition No. 659/2010, Point No- 5.7.5 at Page 67 & 68.
  - Date mismatches with billing cycle.
  - Any data anomaly shall be flagged and held for review.

Summary

Activity	Handled By
OA Energy Parsing (block data)	MDM
Losses + Banking Charge Adjustment	MDM
TOD Conversion (kWh → kVAh)	MDM
Banked Energy Expiry Tracking	MDM
Tariff Application & Billing	RMS
Expired Energy Billing	RMS

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