

**Guidelines for peer-to-peer solar energy transaction through blockchain based platform**

**Definitions:**

1. Blockchain: Blockchain is a digitally distributed, decentralized, public immutable ledger that exists across a network for recording transactions.
2. N<sup>th</sup> Month: The Month in which Distribution Licensee raises the bill of P2P participants for energy transacted on P2P platform.
3. N<sup>th</sup> day: Day on which energy is transacted on P2P platform.
4. Participant: Means a prosumer or a consumer who has registered with the Distribution Licensee and Service Provider to sell or buy rooftop solar energy through P2P platform provided by the Service Provider.
5. P2P Consumer: A person who is a consumer of Distribution Licensee and is registered with the Service Provider to buy solar energy through P2P platform from a P2P prosumer.
6. P2P Prosumer: a person who is a consumer of Distribution Licensee and is registered with the Service Provider to sell its solar energy generated through rooftop solar under UPERC (Rooftop Solar PV Grid Interactive System Gross / Net Metering) Regulations, 2019 on P2P platform.
7. P2P Platform: Peer to Peer Platform means blockchain based electronic platform provided by the Service Provider on which P2P Prosumer can sell their solar energy to P2P Consumers at a price mutually agreed by them on P2P Platform.
8. P2P transaction: Peer to Peer transaction means transaction of energy among P2P participants through P2P platform provided by Service Provider.
9. Service Provider: An agency who registers itself with UPPCL to provide P2P solar energy transaction services on blockchain based P2P Platform.
10. Transaction Charge: Fees charged by Service Provider for P2P solar energy transaction on P2P platform, as specified by the Commission. (Presently it has been taken as Rs. 0.42 (incl. of GST) per unit, thereby levying @ Rs. 0.21 on P2P Prosumer and P2P Consumer both)
11. Transaction Price: Mutually agreed price between P2P Prosumers and P2P Consumers, for energy transacted on P2P platform.

Save as aforesaid and unless repugnant to the context or if the subject matter otherwise requires, words and expressions used in these guidelines and not defined here, but defined in Electricity Act 2003 or any other regulations of this Commission shall have the meaning assigned to them under the Act or any other regulations of this Commission.

## 1. Objective:

These guidelines are framed to promote rooftop solar, efficient utilization of existing assets and to implement innovative technologies by facilitating transaction of rooftop solar energy through blockchain based P2P platform.

## 2. Registration of Service Provider

The detailed procedure, for registration of Service Provider, containing conditions, such as technical know-how, credit worthiness or any other condition shall be as prescribed by UPPCL, under information to the Commission.

Service Provider shall register with the Distribution Licensee, where it will provide services. The registration shall be initially valid for a period of 3 years after commissioning and commercial operationalisation, which can be extended on mutually agreed terms.

## 3. Registration of P2P participants

Distribution Licensee and Service Provider shall jointly prepare and publish a registration form having formats including, but not limited to, user's information, checklist of system/technical prerequisites required by P2P participant to participate in P2P exchange.

Provided that only such prosumers having rooftop solar installed in their premises under UPERC (Rooftop Solar PV Grid Interactive System Gross / Net Metering) Regulations, 2019 can register on P2P platform only as sellers.

### **Steps of Registration:**

1. Any P2P participant who wants to participate shall register themselves with their respective Distribution Licensee, who in turn shall communicate it to the Service Provider.
2. Within 15 days of submission of registration, Officers from Distribution Licensee and Service Provider shall jointly check the compatibility of P2P participants' system for readiness for P2P exchange.
3. In case of rejection of request, Distribution Licensee and/or Service Provider shall convey reasons to applicant, in writing.
4. To avail the P2P services, a P2P Prosumer and P2P Consumer shall have post-paid smart meters installed in its premises. If post-paid smart meter is not installed in their premises, then they will have to install it at its own cost. The cost of any additional hardware/software beyond meter shall be borne by the Service Provider.
5. In case of acceptance of Distribution Licensee and Service Provider, the P2P participant shall be registered on P2P platform within 15 days after the activity is carried out in accordance with S.No.2 above.

## 4. Scope of P2P transaction

P2P participants shall be able to transact energy through P2P Platform within the area of a Distribution Licensee. The Service Provider shall develop a rollout plan, in consultation with Distribution Licensee.

## 5. Metering

P2P Prosumer and P2P Consumer shall have post-paid smart meters installed to participate on P2P platform. Service Provider shall utilise the data of Distribution Licensee's meters through MDM to capture P2P transactions for the purposes of billing and also to reconcile the schedule transaction with the actual transactions on P2P platform.



## 6. Submission of Transaction Schedule

For day ahead transactions, P2P participants shall submit their schedule for the energy to be transacted on P2P platform on  $n^{\text{th}}$  day, by 1700 hrs of  $(n-1)^{\text{th}}$  day. No deviation in schedule shall be allowed beyond this time.

For intraday transactions, P2P participants shall submit their schedule for the energy to be transacted on P2P platform at least four-time blocks before the commencement of schedule. No deviation in schedule shall be allowed beyond this point.

Provided also that P2P Prosumer shall not transact energy more than their own solar generation per day.

## 7. Billing

1. Billing cycle of P2P Platform shall be in sync with the billing cycle of Distribution Licensee. Distribution Licensee and Service Provider may mutually decide the modalities of settlement if the billing cycles differ.
2. Service Provider shall fetch time block-wise meter data for each day for both P2P Prosumer and P2P Consumer for actual energy generated and consumed respectively.
3. Distribution Licensee shall generate the bills of P2P participants on the basis of:

S.No.	Charges	Value
1.	<b>Mutually agreed transaction price</b>	As agreed between P2P Prosumers and P2P Consumers, for energy transacted on P2P platform.
2.	<b>Energy and demand charges (For energy supplied by Distribution Licensee)</b>	As per rate schedule in UPERC Tariff Order
3.	<b>Open Access Charges</b>	
i.	Wheeling charges	As per applicable UPERC Tariff Order
ii.	Cross subsidy surcharge	As per applicable UPERC Tariff Order
iii.	Additional surcharge	Nil. 100% waiver
iv.	Charges for difference between schedule and actual P2P transaction	
	a) Under injection of energy by the P2P Prosumer	Payment equivalent to difference between energy charges as per rate schedule and mutually agreed price on P2P Platform by P2P Prosumer.
	b) Over injection of energy by the Prosumer	Settlement of excess energy shall be done as per the gross/net-meter/net-feed in arrangement of Prosumer. If no schedule is submitted by Prosumer, then the energy injected by him on $n^{\text{th}}$ day shall be adjusted as per the gross/net-meter/net-feed in arrangement of Prosumer.
	c) Under drawl of energy by P2P Consumer	Full payment of quantum of energy pledged by it on P2P platform to the P2P Prosumer(s)
	d) Overdrawal of energy by P2P Consumer	No penal charges. However, settlement shall be done as per Note 1 below.

4.	<b>Transaction Charge</b>	Fees charged by Service Provider for P2P solar energy transaction on P2P platform, as prescribed by the Commission.
----	---------------------------	---

*Note: 1. Settlement shall be done first towards the energy transacted on the P2P platform and then towards the energy supplied by Distribution Licensee. In the event the total demand (P2P transaction + purchase from Distribution Licensee) exceeds the contracted demand, penalty shall be imposed as per the provisions of the Tariff Order or Supply Code, which shall devolve to the Distribution Licensee.*

*Note: 2: Illustrations for different billing scenarios are provided in Annexures 1-6*

4. The bill shall be raised for total demand (P2P transaction + purchase from Distribution Licensee) by the Distribution Licensee as per the provisions of Tariff Order and Supply Code.
5. The payment made by P2P Consumers shall be settled proportionately towards the energy transacted by them on P2P platform, Service Provider transaction charge, energy supplied by Distribution Licensee and Open Access charges.
6. Open Access charges will get devolved to Distribution Licensee. The Open Access Charges shall consist of Wheeling charges and Imbalance charge as detailed in S.No. 3(iv) above.
7. Service Provider transaction charges will be given to Service Provider by Distribution Licensee after settlement with P2P participants.

## 8. Default in Payment

1. The P2P Consumer shall have to clear all the dues for the energy transacted on P2P platform as per due date. P2P participant shall be deactivated from P2P platform, if the dues are not paid.
2. In the event of default in payment for energy supplied by Distribution Licensee, appropriate action shall be taken as per Electricity Supply Code.

## 9. RPO Obligation

RPO benefits of rooftop solar PV shall remain with the Distribution Licensee.

## 10. Rights and Responsibilities of P2P participants

1. P2P participants shall not indulge in cartelization or gaming to deter the financial interest of licensee.
2. It has to be ensured that participating into P2P exchange does not compromise aspects of electrical safety.
3. Data privacy and cyber security shall be maintained by Distribution Licensee and Service Provider.

## 11. Roles and responsibilities of Service Provider

1. Service Provider shall create awareness and train P2P participants and Distribution Licensee officials regarding functioning of P2P platform.
2. Service Provider shall ensure that the systems installed by it for facilitating P2P exchange does not disrupt Distribution Licensee's system.
3. Service Provider shall ensure that there is seamless settlement between P2P partners.



4. Service Provider shall ensure that its cloud & communication facility is flexible to accommodate any operational or regulatory change.
5. If a meter is installed by the Service Provider in series with Distribution Licensee's meter and this meter becomes defective, then it shall be incumbent upon the Service Provider to replace its meter within 24 hours.

## 12. Roles and responsibilities of Licensee

1. Licensee shall work with the Service Provider to integrate their systems.
2. To ensure that metering is in order, if a defect emerges in the Distribution Licensee's meter of a P2P participant, the Distribution Licensee shall replace the meter as per provisions of Electricity Supply Code.
3. If the distribution system is under outage, then no penal imposition will be made on either P2P Prosumer or P2P Consumer for the failure to transact as per committed transaction. However, UPERC Standards of Performance Regulations shall be applicable for P2P Consumer.

## 13. Power to Amend

The Commission may, at any time add, vary, alter, modify or amend any provision of these guidelines.

## 14. Power to Remove Difficulty


If any difficulty arises in giving effect to these guidelines, the Commission may on its own motion or on an application filed by any affected party, issue such practice directions as may be considered necessary in furtherance of the objective of these guidelines.

## 15. Powers to Relax

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected, may relax any of the provisions of these guidelines on its own motion or on an application made before it by the affected party.

## 16. Redressal Mechanism

If there is any dispute between the P2P participant and licensee/Service Provider, then the P2P participant shall approach the corresponding CGRF. If there is any dispute between the Distribution Licensee and Service Provider, then Distribution Licensee/Service Provider shall approach the Commission.

  
(V.K. Srivastava)  
Member (Law)

  
(Raj Pratap Singh)  
Chairman

Place: Lucknow

Dated: 05-04-2023



# ANNEXURE 1

Sample Bill of Prosumer (Commercial) No Imbalance			
	Details		Unit
A	Energy Purchased from Discom	15,000.00	kWh
B	P2P Scheduled Energy	2,800.00	kWh
C	Energy Sold to P2P Platform	2,800.00	kWh
D	Contracted Demand	20.00	KW
G	Load on P2P Platform	20.00	KW
H	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
I	Demand Charges For energy supplied by Discom	450.00	Rs./kW
J	Wheeling charges	0.92	Rs./kWh
K	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
L	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

Bill for Prosumer by Discom			
M	Energy Charges For energy supplied by Discom ( $1000 \times 7.5 + (H \times (A - 1000))$ )	1,30,000.00	Rs.
N	Demand Charges For energy supplied by Discom ( $D \times I$ )	9,000.00	Rs.
O	Total (M+N)	1,39,000.00	Rs.

Bill for transaction on P2P Platform			
	Receivable		
P	Receivable from energy sold on P2P ( $C \times L$ )	14,000.00	Rs.
Q	Receivable from over injection into grid (@Rs.3.58375/kWh)	-	Rs.

	Charges		
R	Under Injection Charges	-	Rs.
S	Service Provider Transaction Charges ( $B \times K$ )	588.00	Rs.

T	Total amount payable towards Discom charges ( $O + R$ )	1,39,000.00	Rs.
U	Total Receivable towards P2P and over injection ( $P + Q$ )	14,000.00	Rs.
V	Service Provider Transaction Charges Payable ( $S$ )**	588.00	Rs.
W	Net amount payable ( $T - U + V$ )	1,25,588.00	Rs.

\*\*Discom to remit these charges to Service Provider

## Benefit analysis for Prosumer

Case 1: Gross Metering Arrangement			
AA	Rate/unit for Gross Metering arrangement	3.58375	
AB	Revenue from Energy Sold under Gross Metering Arrangement ( $C \times AA$ )	10,034.50	
AC	Net benefit from Energy Sold under P2P ( $U - V$ )	13,412.00	
AD	Net Benefit of P2P vs Gross Metering ( $AC - AB$ )	3,377.50	

Case 2: Net Metering (Assuming 100% self consumption. Assuming Net Metering was granted to Commercial Prosumer prior to UPERC RSPV Regulations, 2019)			
AE	Saving by net metering ( $C \times H$ )	24,500.00	
AF	Net benefit from Energy Sold under P2P ( $U - V$ )	13,412.00	
AG	Net Benefit of P2P vs Net Metering ( $AF - AE$ )	-11,088.00	

Case 3: Net Feed In		50% self consumption	20% self consumption	0% self consumption
AH	Rate/unit for Net Feed In arrangement	3.58375	3.58375	3.58375
AI	Percent self consumption in Net Feed In	50.0%	20.0%	-
AJ	Saving by self consumption ( $C \times H \times AI$ )	12,250.00	4,900.00	-
AK	Revenue from Energy Sold under Net Feed In Arrangement [ $C \times AH \times (1 - AI)$ ]	5,017.25	8,027.60	10,034.50
AL	Net benefit under Net Feed In arrangement ( $AJ + AK$ )	17,267.25	12,927.60	10,034.50
AM	Net benefit from Energy Sold under P2P ( $U - V$ )	13,412.00	13,412.00	13,412.00
AN	Net Benefit of P2P vs Net Feed In Metering ( $AM - AL$ )	-3,855.25	484.40	3,377.50

(Situation is akin to Gross Metering)

8

2

4



## ANNEXURE 2

Sample Bill of Prosumer (Commercial) Under Injection			
	Details		Unit
A	Energy Purchased from Discom	15,000.00	kWh
B	P2P Scheduled Energy	2,800.00	kWh
C	Energy Sold to P2P Platform	2,400.00	kWh
D	Contracted Demand	20.00	KW
G	Load on P2P Platform	20.00	KW
H	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
I	Demand Charges For energy supplied by Discom	450.00	Rs./kW
J	Wheeling charges	0.92	Rs./kWh
K	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
L	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

Bill for Prosumer by Discom			
M	Energy Charges For energy supplied by Discom $(1000 \times 7.5 + (H \times (A - 1000)))$	1,30,000.00	Rs.
N	Demand Charges For energy supplied by Discom $(D \times I)$	9,000.00	Rs.
O	Total $(M+N)$	1,39,000.00	Rs.

Bill for transaction on P2P Platform			
Receivable			
P	Receivable from energy sold on P2P $(C \times L)$	12,000.00	Rs.
Q	Receivable from over injection into grid @Rs.3.58375/kWh	-	Rs.

Charges			
R	Under Injection Charges $[(B-C) \times (H-L)]$	1,500.00	Rs.
S	Service Provider Transaction Charges $(B \times K)$	588.00	Rs.

T	Total amount payable towards Discom charges $(O+R)$	1,40,500.00	Rs.
U	Total Receivable towards P2P and over injection $(P+Q)$	12,000.00	Rs.
V	Service Provider Transaction Charges Payable $(S)^{**}$	588.00	Rs.
W	Net amount payable $(T-U+V)$	1,29,088.00	Rs.

**\*\*Discom to remit these charges to Service Provider**

### Benefit analysis for Prosumer

Case 1: Gross Metering Arrangement			
AA	Rate/unit for Gross Metering arrangement	3.58375	
AB	Revenue from Energy Sold under Gross Metering Arrangement $(C \times AA)$	8,601.00	
AC	Net benefit from Energy Sold under P2P $(U-R-V)$	9,912.00	
AD	Net Benefit of P2P vs Gross Metering $(AC - AB)$	1,311.00	

Case 2: Net Metering (Assuming 100% self consumption. Assuming Net Metering was granted to Commercial Prosumer prior to UPERC RSPV Regulations, 2019)			
AE	Saving by net metering $(C \times H)$	21,000.00	
AF	Net benefit from Energy Sold under P2P $(U-R-V)$	9,912.00	
AG	Net Benefit of P2P vs Net Metering $(AF - AE)$	-11,088.00	

Case 3: Net Feed In		50% self consumption	20% self consumption	0% self consumption
AH	Rate/unit for Net Feed In arrangement	3.58375	3.58375	3.58375
AI	Percent self consumption in Net Feed In	50.0%	20.0%	-
AJ	Saving by self consumption $(C \times H \times AI)$	10,500.00	4,200.00	-
AK	Revenue from Energy Sold under Net Feed In Arrangement $[C \times AH \times (1-AI)]$	4,300.50	6,880.80	8,601.00
AL	Net benefit under Net Feed In arrangement $(AJ + AK)$	14,800.50	11,080.80	8,601.00
AM	Net benefit from Energy Sold under P2P $(U-R-V)$	9,912.00	9,912.00	9,912.00
AN	Net Benefit of P2P vs Net Feed In Metering $(AM - AL)$	-4,888.50	-1,168.80	1,311.00

(Situation is akin to Gross Metering)

### ANNEXURE 3

Sample Bill of Prosumer (Commercial) Over Injection Gross Metering and Net Feed In			
	Details		Unit
A	Energy Purchased from Discom	15,000.00	kWh
B	P2P Scheduled Energy	2,400.00	kWh
C	Energy Sold to P2P Platform	2,800.00	kWh
D	Contracted Demand	20.00	KW
G	Load on P2P Platform	20.00	KW
H	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
I	Demand Charges For energy supplied by Discom	450.00	Rs./kW
J	Wheeling charges	0.92	Rs./kWh
K	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
L	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

Bill for Prosumer by Discom			
M	Energy Charges For energy supplied by Discom ( $1000 \times 7.5 + (H \times (A - 1000))$ )	1,30,000.00	Rs.
N	Demand Charges For energy supplied by Discom ( $D \times I$ )	9,000.00	Rs.
O	Total (M+N)	1,39,000.00	Rs.

Bill for transaction on P2P Platform			
<b>Receivable</b>			
P	Receivable from energy sold on P2P ( $B \times L$ )	12,000.00	Rs.
Q	Receivable from over injection into grid @Rs.3.58375/kWh $[(C-B) \times 3.58375]$	1,433.50	Rs.

<b>Charges</b>			
R	Under Injection Charges	-	Rs.
S	Service Provider Transaction Charges ( $B \times K$ )	504.00	Rs.
T	Total amount payable towards Discom charges (O+R)	1,39,000.00	Rs.
U	Total Receivable towards P2P and over injection (P+Q)	13,433.50	Rs.
V	Service Provider Transaction Charges Payable (S)**	504.00	Rs.
W	Net amount payable (T-U+V)	1,26,070.50	Rs.

\*\*Discom to remit these charges to Service Provider

#### Benefit analysis for Prosumer

Case 1: Gross Metering Arrangement			
AA	Rate/unit for Gross Metering arrangement	3.58375	
AB	Revenue from Energy Sold under Gross Metering Arrangement ( $C \times AA$ )	10,034.50	
AC	Net benefit from Energy Sold under P2P (U-V)	12,929.50	
AD	Net Benefit of P2P vs Gross Metering (AC - AB)	2,895.00	

Case 2: Net Feed In		50% self consumption	20% self consumption	0% self consumption
AH	Rate/unit for Net Feed In arrangement	3.58375	3.58375	3.58375
AI	Percent self consumption in Net Feed In	50.0%	20.0%	0.0%
AJ	Saving by self consumption ( $C \times H \times AI$ )	12,250.00	4,900.00	-
AK	Revenue from Energy Sold under Net Feed In Arrangement ( $C \times AH \times (1 - AI)$ )	5,017.25	8,027.60	10,034.50
AL	Net benefit under Net Feed In arrangement (AJ + AK)	17,267.25	12,927.60	10,034.50
AM	Net benefit from Energy Sold under P2P (U-V)	12,929.50	12,929.50	12,929.50
AN	Net Benefit of P2P vs Net Feed In Metering (AM - AL)	-4,337.75	1.90	2,895.00

(Situation is akin to Gross Metering)

2

by

2



# ANNEXURE 4

## Sample Bill of Prosumer (Commercial) Over Injection Net Metering

	Details		Unit
A	Energy Purchased from Discom	15,000.00	kWh
B	P2P Scheduled Energy	2,400.00	kWh
C	Energy Sold to P2P Platform	2,800.00	kWh
D	Contracted Demand	20.00	KW
G	Load on P2P Platform	20.00	KW
H	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
I	Demand Charges For energy supplied by Discom	450.00	Rs./kW
J	Wheeling charges	0.92	Rs./kWh
K	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
L	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

### Bill for Prosumer by Discom

M	Energy Charges For energy supplied by Discom ( $1000 \times 7.5 + (H \times (A - 1000))$ )	1,30,000.00	Rs.
N	Demand Charges For energy supplied by Discom ( $D \times I$ )	9,000.00	Rs.
O	Total (M+N)	1,39,000.00	Rs.

### Bill for transaction on P2P Platform

<b>Receivable</b>			
P	Receivable from energy sold on P2P ( $B \times L$ )	12,000.00	Rs.
Q	Saving from net metering $[(C - B) \times H] \times \#$	3,500.00	Rs.

### Charges

R	Under Injection Charges	-	Rs.
S	Service Provider Transaction Charges ( $B \times K$ )	504.00	Rs.

T	Total amount payable towards Discom charges (O+R)	1,39,000.00	Rs.
U	Total Receivable towards P2P and over injection (P+Q)	15,500.00	Rs.
V	Service Provider Transaction Charges Payable (S)**	504.00	Rs.
W	Net amount payable (T-U+V)	1,24,004.00	Rs.

**\*\*Discom to remit these charges to Service Provider**

**# the savings from over injection will be adjusted next month**

### Benefit analysis for Prosumer

**Case: Net Metering (Assuming 100% self consumption. Assuming Net Metering was granted to Commercial Prosumer prior to UPERC RSPV Regulations, 2019)**

AE	Saving by net metering ( $C \times H$ )	24,500.00
AF	Net benefit from Energy Sold under P2P (U-V)	14,996.00
AG	Net Benefit of P2P vs Net Metering (AF - AE)	-9,504.00

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*

# ANNEXURE 5

## Sample Bill of Consumer (Commercial) No imbalance

	Details		Unit
A	Energy Purchased from Discom	12,000.00	kWh
B	P2P Scheduled Energy	2,800.00	kWh
C	Energy Purchased from P2P Platform	2,800.00	kWh
D	Contracted Demand	20.00	KW
E	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
F	Demand Charges For energy supplied by Discom	450.00	Rs./kW
G	Wheeling charges	0.92	Rs./kWh
H	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
I	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

	Bill for Consumer by Discom		
J	Energy Charges For energy supplied by Discom $[1000*7.5+(E*(A-1000))]$	1,03,750.00	Rs.
K	Demand Charges For energy supplied by Discom $(D*F)$	9,000.00	Rs.
L	Total $(J+K)$	1,12,750.00	Rs.

	Bill for transaction on P2P Platform		
	Payable		
M	Payable from energy bought on P2P $(C*I)$	14,000.00	Rs.

	Charges		
N	Open Access Charges: Wheeling charges $(B*G)$	2,576.00	Rs.
O	Under drawal charge $(B-C)*I$	-	Rs.
P	Service Provider Transaction Charges $(B*H)$	588.00	Rs.

Q	Total amont payable towards Discom charges $(L+N+O)$	1,15,326.00	Rs.
R	Total Payable towards P2P energy $(M)$	14,000.00	Rs.
S	Service Provider Transaction Charges $(P)**$	588.00	Rs.
T	Net amont payable $(Q+R+S)$	1,29,914.00	Rs.

\*\*Discom to remit these charges to Service Provider

Net benefit to Consumer  $[C*(E-I)-N-O-S]$  ₹ 7,336.00

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*



# ANNEXURE 6

Sample Bill of Consumer (Commercial) Underdrawal			
	Details		Unit
A	Energy Purchased from Discom	12,000.00	kWh
B	P2P Scheduled Energy	2,800.00	kWh
C	Energy Purchased from P2P Platform	2,600.00	kWh
D	Contracted Demand	20.00	KW
E	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
F	Demand Charges For energy supplied by Discom	450.00	Rs./kW
G	Wheeling charges	0.92	Rs./kWh
H	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
I	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh

Bill for Consumer by Discom			
J	Energy Charges For energy supplied by Discom $[1000 \times 7.5 + (E \times (A - 1000))]$	1,03,750.00	Rs.
K	Demand Charges For energy supplied by Discom $(D \times F)$	9,000.00	Rs.
L	Total $(J+K)$	1,12,750.00	Rs.

Bill for transaction on P2P Platform			
Payable			
M	Payable from energy bought on P2P $(C \times I)$	13,000.00	Rs.

Charges			
N	Open Access Charges: Wheeling charges $(B \times G)$	2,576.00	Rs.
O	Under drawal charge $(B - C) \times I$	1,000.00	Rs.
P	Service Provider Transaction Charges $(B \times H)$	588.00	Rs.

Q	Total amont payable towards Discom charges $(L+N+O)$	1,16,326.00	Rs.
R	Total Payable towards P2P energy (M)	13,000.00	Rs.
S	Service Provider Transaction Charges $(P)^{**}$	588.00	Rs.
T	Net amont payable $(Q+R+S)$	1,29,914.00	Rs.

**\*\*Discom to remit these charges to Service Provider**

**Net benefit to Consumer  $[C \times (E - I) - N - O - S]$  ₹ 5,586.00**

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*

# ANNEXURE 7

Sample Bill of Consumer (Commercial) Overdrawal			
	Details		Unit
A	Energy Purchased from Discom	12,000.00	kWh
B	P2P Scheduled Energy	2,600.00	kWh
C	Energy Purchased from P2P Platform	2,600.00	kWh
D	Overdrawn energy	200.00	kWh
E	Contracted Demand	20.00	KW
F	Energy Charges For energy supplied by Discom	8.75	Rs./kWh
G	Demand Charges For energy supplied by Discom	450.00	Rs./kW
H	Wheeling charges	0.92	Rs./kWh
I	Transaction Charge (on P2P transaction)	0.21	Rs./kWh
J	Mutually agreed transaction price (assumed to be same for all time blocks)	5.00	Rs/kWh
<b>Bill for Consumer by Discom</b>			
K	Energy Charges For energy supplied by Discom $[1000*7.5+(F*(A+D-1000))]$	1,05,500.00	Rs.
L	Demand Charges For energy supplied by Discom $(E*G)$	9,000.00	Rs.
M	Total $(K+L)$	1,14,500.00	Rs.
<b>Bill for transaction on P2P Platform</b>			
<b>Payable</b>			
N	Payable from energy bought on P2P $(C*J)$	13,000.00	Rs.
<b>Charges</b>			
O	Open Access Charges: Wheeling charges $(B*H)$	2,392.00	Rs.
P	Under drawal charge $(B-C)*J$	-	Rs.
Q	Service Provider Transaction Charges $(B*I)$	546.00	Rs.
R	Total amont payable towards Discom charges $(M+O+P)$	1,16,892.00	Rs.
S	Total Payable towards P2P energy $(N)$	13,000.00	Rs.
T	Service Provider Transaction Charges $(Q)**$	546.00	Rs.
U	<b>Net amont payable <math>(R+S+T)</math></b>	<b>1,30,438.00</b>	<b>Rs.</b>

\*\*Discom to remit these charges to Service Provider

Net benefit to Consumer  $[C*(F-J)-O-P-T]$  ₹ 6,812.00

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*