

OPEN ACCESS WHEELING:

SAMPLE ILLUSTRATION AND EXPLANATORY NOTE

A) EXPLANATORY NOTE:

1. **Applicability of Wheeling Charge:** The Commission had determined wheeling charges and wheeling loss for use of distribution network of various distribution licensees under its MYT Order for FY 2007-08 and under its APR Orders for FY 2008-09 and FY 2009-10 for each distribution licensee, separately. For example, following APR Orders forms basis for applicable wheeling charges for use of distribution network of the concerned distribution licensee:
 - Case 116 of 2008 : APR Order for MSEDCL for FY 2009-10
 - Case 113 of 2008 : APR Order for TPC-D for FY 2009-10
 - Case 121 of 2008 : APR Order for REL-D for FY 2009-10
 - Case 155 of 2008: APR Order for Transmission Tariff for InSTS for FY 2009-10.
2. **Wheeling Charge and Wheeling loss for MSEDCL network:** The Commission has determined the wheeling charges and wheeling loss for use of distribution network of MSEDCL under APR Order for FY 2009-10 as under:
(Ref. Cl 5.6, Page 207/209 of Order in Case No 116 of 2008)

Voltage Level	Wheeling Charge(Rs./ kWh)	Wheeling Loss (%)
33 kV	0.05	6%
22 kV/11 kV	0.25	9%
LT level	0.43	14%

3. **Transmission Tariff for InSTS:** In addition, the Commission has separately determined transmission tariff for use of InSTS under its Transmission Tariff Order (Case 155 of 2008) for FY 2009-10 as under: *(ref. cl. 9 page 4 of Order in Case 155 of 2008)*

Item Description	Units	FY 2008-09
Transmission Tariff (long-term)	Rs/kW/month	111.73
Transmission Tariff (long-term)	Rs/MW/day	3773.00
Transmission Tariff (short-term)	Rs/MW/day	918.25

Further, in case of short-term open access transactions, the Commission has clarified as under:

“11. Accordingly, Transmission Tariff for short-term open access transactions for FY 2009-10, shall be Rs 918.25 per MW per day or Rs 38.26 per MW per hour. Further, it is clarified that as stipulated under Para 3.2.5.6 reproduced above, the short-term transmission charges shall be payable for minimum 6 hours duration within a day and shall be accordingly 1/4th of short term transmission open access charge per day. The recovery from short term transmission open access charges shall be used to reduce total transmission system charge (TTSC) for the Intra-State Transmission System and in turn benefit long term transmission system users.”

4. **Transmission loss for InSTS**: The Commission had ruled that applicable Transmission loss for InSTS for FY 2009-10 shall be 4.85%. However, actual transmission loss shall be borne by all TSUs on pro-rata basis based on their energy drawal depending on actual transmission loss level. *(ref. Cl. 19 page 8 of Order in Case No. 155 of 2008 and cl. 26,27 of Order in Case no 31 of 2006)*

5. **Wheeling Charge and Wheeling loss for TPC-D**: The Commission has determined wheeling charge and wheeling loss for use of distribution network of TPC-D under Order in Case No. 113 of 2008 as under: *(ref. cl. 5.6 page 146/148 of Order in Case No 113 of 2008)*

Item Description	Wheeling Charge (Rs/kW/month)	Wheeling Loss (%)
HT level	78	0.66%
LT level	160	0.66%

The Commission under its Clarificatory Order in Case No. 113 of 2008 dated July 22, 2009 has determined the wheeling charges in terms of Rs/kWh for use of distribution network of TPC-D is summarised in the following table: *(ref. cl. 5.6 page 146/148 of Order in Case No 113 of 2008)*

Item Description	Wheeling Charge (Rs/kWh)	Wheeling Loss (%)
HT level	0.18	0.66%
LT level	0.37	0.66%

6. **Wheeling Charge and Wheeling loss REL-D:** The Commission has determined wheeling charge and wheeling loss for use of distribution network of REL-D under Order in Case No. 66 of 2007 as under: *(ref. cl. 5.6 page 196/197 of Order in Case No 121 of 2008)*

Item Description	Wheeling Charge (Rs/kW/month)	Wheeling Loss (%)
HT level	108	1.5%
LT level	121	9.0%

The Commission under its Clarificatory Order in Case No. 121 of 2008 dated July 22, 2009 has determined the wheeling charges in terms of Rs/kWh for use of distribution network of RInfra-D is summarised in the following table: *(page 4 of clarificatory Order in Case No 121 of 2008)*

Item Description	Wheeling Charge (Rs/kWh)	Wheeling Loss (%)
HT level	0.46	1.5%
LT level	0.88	9.0%

7. Depending on nature of open access transaction, the injection point(s) and drawal point(s) for open access wheeling transaction could lead to use of distribution assets of multiple distribution licensees and/or use of intra-state transmission system. Even in case of particular distribution licensees, the wheeling charges applicable for a particular open access transaction shall depend on voltage level at injection point(s) and drawal point(s), as wheeling charges are determined in accordance with voltage level. Accordingly, transmission charges, transmission losses, wheeling charges and wheeling losses applicable for a particular transaction have to be ascertained on the basis of use of assets of concerned licensee and extent of use at a particular voltage level.
8. A summary of applicable transmission charge, transmission loss, wheeling charge and wheeling loss for various cases of open access wheeling transaction is presented below in tabular form for ease of understanding.

Table 1.1: Summary of Transmission charge, Transmission loss, wheeling charge and wheeling loss for different distribution licensees at various voltage levels

Transmission Charge and Transmission loss	Units	Transmission Charge	Transmission loss	Reference of Order
Transmission Tariff (long-term)	Rs/kW/month	111.73	4.85%	MERC Transmission Tariff Order (FY 2008-09), (Case No. 155 of 2008) Cl. 9 of Page 4
Transmission Tariff (long-term)	Rs/MW/day	3673.00	4.85%	
Transmission Tariff (short-term)	Rs/MW/day	918.25	4.85%	

Wheeling Charges and Wheeling losses		Wheeling Charge	Wheeling loss	
<u>MSEDCL</u>				
-132 kV	Rs/kWh	0	0%	Ref. Cl 5.6, Page 207/209 of Order in Case No 116 of 2008.
-33 kV	Rs/kWh	0.05	6%	
-22 kV/ 11 kV	Rs/kWh	0.25	9%	
LT level	Rs/kWh	0.43	14%	
<u>TPC-D</u>				
-33kV/22 kV/ 11kV(HT)	Rs/kWh	0.18	0.66%	Ref. page 4 of Clarificatory Order in Case No 113 of 2008.
LT level	Rs/kWh	0.37	0.66%	
<u>REL-D</u>				
-33kV/22 kV/ 11kV (HT)	Rs/kWh	0.46	1.5%	Ref. page 4 of Clarificatory Order in Case No 121 of 2008
LT level	Rs/kWh	0.88	9.0%	

Nomenclature used for wheeling charge and wheeling loss of various distribution licensees at various voltage levels is given in following table 1.2 for ease of reference:

Table 1.2: Nomenclature adopted for wheeling charge and wheeling loss for different distribution licensees

Nomenclature	Wheeling charge (wc)	Wheeling loss (wl)
MSEDCL 132 kV	M_{wc132}	M_{wl132}
MSEDCL 33 kV	M_{wc33}	M_{wl33}
MSEDCL 11 Kv	M_{wc11}	M_{wl11}
MSEDCL LT	M_{wc1t}	M_{wl1t}
TPC HT	T_{wc1t}	T_{wl1t}
TPC LT	T_{wc1t}	T_{wl1t}

Nomenclature	Wheeling charge (wc)	Wheeling loss (wl)
REL_HT	$R_{wc,ht}$	$R_{wl,ht}$
REL_LT	$R_{wc,lt}$	$R_{wl,lt}$

Table 1.3: Applicable Wheeling charge for open access wheeling transaction with different Injection Point(s) and Drawal Point(s)

Table for Wheeling Cost		Rs/kW/month	$M_{wc,132}$	$M_{wc,33}$	$M_{wc,11}$	$M_{wl,lt}$	$T_{wc,ht}$	$T_{wl,lt}$	$R_{wc,ht}$	$R_{wl,lt}$
		Injection	I1	I2	I3	I4	I5	I6	I7	I8
Rs/kW/month	Drawal		MSE_132kV	MSE_33kV	MSE_11V	MSE_LT	TPC_HT	TPC_LT	REL_HT	REL_LT
$M_{wc,132}$	D1	MSE_132kV	0	$M_{wc,33}$	$M_{wc,11}$	$M_{wc,lt}$	$T_{wc,ht}$	$T_{wc,lt}$	$R_{wc,ht}$	$R_{wc,lt}$
$M_{wc,33}$	D2	MSE_33kV	$M_{wc,33}$	$M_{wc,33}$	$M_{wc,11}$	$M_{wc,lt}$	$M_{wc,33+T_{wc,ht}}$	$M_{wc,33+T_{wc,lt}}$	$M_{wc,33+R_{wc,ht}}$	$M_{wc,33+R_{wc,lt}}$
$M_{wc,11}$	D3	MSE_11V	$M_{wc,11}$	$M_{wc,11}$	$M_{wc,11}$	$M_{wc,lt}$	$M_{wc,11+T_{wc,ht}}$	$M_{wc,11+T_{wc,lt}}$	$M_{wc,11+R_{wc,ht}}$	$M_{wc,11+R_{wc,lt}}$
$M_{wc,lt}$	D4	MSE_LT	$M_{wc,lt}$	$M_{wc,lt}$	$M_{wc,lt}$	$M_{wc,lt}$	$M_{wc,lt+T_{wc,ht}}$	$M_{wc,lt+T_{wc,lt}}$	$M_{wc,lt+R_{wc,ht}}$	$M_{wc,lt+R_{wc,lt}}$
$T_{wc,ht}$	D5	TPC_HT	$T_{wc,ht}$	$M_{wc,33+T_{wc,ht}}$	$M_{wc,11+T_{wc,ht}}$	$M_{wc,lt+T_{wc,ht}}$	$T_{wc,ht}$	$T_{wc,lt}$	$T_{wc,ht+R_{wc,ht}}$	$T_{wc,ht+R_{wc,lt}}$
$T_{wc,lt}$	D6	TPC_LT	$T_{wc,lt}$	$M_{wc,33+T_{wc,lt}}$	$M_{wc,11+T_{wc,lt}}$	$M_{wc,lt+T_{wc,lt}}$	$T_{wc,lt}$	$T_{wc,lt}$	$T_{wc,lt+R_{wc,ht}}$	$T_{wc,lt+R_{wc,lt}}$
$R_{wc,ht}$	D7	REL_HT	$R_{wc,ht}$	$M_{wc,33+R_{wc,ht}}$	$M_{wc,11+R_{wc,ht}}$	$M_{wc,lt+R_{wc,ht}}$	$T_{wc,ht+R_{wc,ht}}$	$T_{wc,lt+R_{wc,ht}}$	$R_{wc,ht}$	$R_{wc,lt}$
$R_{wc,lt}$	D8	REL_LT	$R_{wc,lt}$	$M_{wc,33+R_{wc,lt}}$	$M_{wc,11+R_{wc,lt}}$	$M_{wc,lt+R_{wc,lt}}$	$T_{wc,ht+R_{wc,lt}}$	$T_{wc,lt+R_{wc,lt}}$	$R_{wc,lt}$	$R_{wc,lt}$

Table for Wheeling Cost		Rs/kWh	0	0.05	0.25	0.43	0.18	0.37	0.46	0.88
		Injection	I1	I2	I3	I4	I5	I6	I7	I8
Rs/kWh	Drawal		MSE_132kV	MSE_33kV	MSE_11kV	MSE_LT	TPC_HT	TPC_LT	REL_HT	REL_LT
0	D1	MSE_132kV	0	0.05	0.25	0.43	0.18	0.37	0.46	0.88
0.05	D2	MSE_33kV	0.05	0.05	0.25	0.43	0.18	0.37	0.46	0.88
0.25	D3	MSE_11V	0.25	0.25	0.25	0.43	0.18	0.37	0.46	0.88
0.43	D4	MSE_LT	0.43	0.43	0.43	0.43	0.18	0.37	0.46	0.88
0.18	D5	TPC_HT	0.18	0.23	0.43	0.61	0.18	0.37	0.64	1.06
0.37	D6	TPC_LT	0.37	0.42	0.62	0.80	0.37	0.37	0.83	1.25
0.46	D7	REL_HT	0.46	0.51	0.71	0.89	0.64	0.83	0.46	0.88
0.88	D8	REL_LT	0.88	0.93	1.23	1.31	1.06	1.25	0.88	0.88

In addition to above wheeling charge, transmission charge (long-term or short-term), as the case, shall be applicable, in case Intra-State Transmission system (InSTS) is being used for the purpose of open access wheeling transaction.

Table 1.4: Applicable Wheeling loss for open access wheeling transaction with different Injection Point(s) and Drawal Point(s)

Table for Wheeling loss		% Injection	M _{wl132} I1	M _{wl33} I2	M _{wl11} I3	M _{wlLT} I4	T _{wlht} I5	T _{wlLT} I6	R _{wlht} I7	R _{wlLT} I8
%	Drawal		MSE_132kV	MSE_33kV	MSE_11V	MSE_LT	TPC_HT	TPC_LT	REL_HT	REL_LT
M _{wl132}	D1	MSE_132kV	0	M _{wl33}	M _{wl11}	M _{wlLT}	T _{wlht}	T _{wlLT}	R _{wlht}	R _{wlLT}
M _{wl33}	D2	MSE_33kV	M _{wl33}	M _{wl33}	M _{wl11}	M _{wlLT}	T _{wlht} + M _{wl33}	T _{wlLT} + M _{wl33}	R _{wlht} + M _{wl33}	R _{wlLT} + M _{wl33}
M _{wl11}	D3	MSE_11V	M _{wl11}	M _{wl11}	M _{wl11}	M _{wlLT}	T _{wlht} + M _{wl11}	T _{wlLT} + M _{wl11}	R _{wlht} + M _{wl11}	R _{wlLT} + M _{wl11}
M _{wlLT}	D4	MSE_LT	M _{wlLT}	M _{wlLT}	M _{wlLT}	M _{wlLT}	T _{wlht} + M _{wlLT}	T _{wlLT} + M _{wlLT}	R _{wlht} + M _{wlLT}	R _{wlLT} + M _{wlLT}
T _{wlht}	D5	TPC_HT	T _{wlht}	M _{wl33} + T _{wc} ht	M _{wl11} + T _{wc} ht	M _{wlLT} + T _{wc} ht	T _{wlht}	T _{wlLT}	R _{wlht} + T _{wlht}	R _{wlLT} + T _{wlht}
T _{wlLT}	D6	TPC_LT	T _{wlLT}	M _{wl33} + T _{wc} LT	M _{wl11} + T _{wc} LT	M _{wlLT} + T _{wc} LT	T _{wlLT}	T _{wlLT}	R _{wlht} + T _{wlLT}	R _{wlLT} + T _{wlLT}
R _{wlht}	D7	REL_HT	R _{wlht}	M _{wl33} + R _{wlht}	M _{wl11} + R _{wlht}	M _{wlLT} + R _{wlht}	T _{wlht} + R _{wlht}	T _{wlLT} + R _{wlht}	R _{wlht}	R _{wlLT}
R _{wlLT}	D8	REL_LT	R _{wlLT}	M _{wl33} + R _{wlLT}	M _{wl11} + R _{wlLT}	M _{wlLT} + R _{wlLT}	T _{wlht} + R _{wlLT}	T _{wlLT} + R _{wlLT}	R _{wlLT}	R _{wlLT}

Table for Wheeling loss		% Injection	0 I1	6% I2	9% I3	14% I4	0.66% I5	0.66% I6	1.5% I7	9.0% I8
%	Drawal			MSE_33kV	MSE_11V	MSE_LT	TPC_HT	TPC_LT	REL_HT	REL_LT
0	D1	MSE_132kV	0	6%	9%	14%	0.66%	0.66%	1.5%	9.0%
6%	D2	MSE_33kV	6%	6%	9%	14%	6.66%	6.66%	7.5%	15.0%
9%	D3	MSE_11V	9%	9%	9%	14%	9.66%	9.66%	10.5%	18.0%
14%	D4	MSE_LT	14%	14%	14%	14%	14.66%	14.66%	15.5%	23.0%
0.66%	D5	TPC_HT	0.66%	6.66%	9.66%	14.66%	0.66%	0.66%	2.16%	9.66%
0.66%	D6	TPC_LT	0.66%	6.66%	9.66%	14.66%	0.66%	0.66%	2.16%	9.66%
1.5%	D7	REL_HT	1.5%	7.5%	10.5%	15.5%	2.16%	2.16%	1.5%	9.0%
9.0%	D8	REL_LT	9.0%	15.0%	18.0%	23.0%	9.66%	9.66%	9.0%	9.0%

In addition to above wheeling loss, transmission loss, shall be applicable, in case Intra-State Transmission system (InSTS) is being used for the purpose of open access wheeling transaction.

9. Sample illustration in respect of the following case scenarios of the open access wheeling transaction is summarized in the following section:-

- Case Scenario-1: Injection at 132 kV (InSTS) and Drawal at 132 KV(InSTS)
- Case Scenario-2: Injection at 132 kV (InSTS) and Drawal at 33 KV(MSEDCL, TPC, REL)
- Case Scenario-3: Injection at 132 kV (InSTS) and Drawal at 11 KV(MSEDCL, TPC, REL)
- Case Scenario-4: Injection at 132 kV (InSTS) and Drawal at LT level (MSEDCL, TPC, REL)

Assumption for the purpose of Sample Illustration

Open Access wheeling capacity	-	25 MW
Load Factor/ capacity utilization factor	-	80%
Coast of OA generation (ex-bus)	-	Rs. 2.50 per kWh

B| SAMPLE ILLUSTRATION:

10. Sample Illustration with effective landed cost for Open Access wheeling transaction of the OA consumer for short-term open access wheeling of 25 MW power under various case scenarios is summarized in the following **Table 1.5**. The working for effective landed cost takes into consideration applicable transmission tariff, transmission loss, wheeling charge and wheeling loss as elaborated under earlier paragraph 9.

Table1.5. Sample Illustration for 25 MW Short-term Open Access wheeling Transaction at various Voltage levels

Charges as Per APR Orders		MSEDCL	TPC	REL
Transmission Charge (Rs./kW/month)	Short-term	27.93		
	Long-term	111.73		
Transmission loss Compensation		4.85%		
Wheeling Charges (Rs./kWh)	33kV	0.05	0.18	0.46
	22/11kV	0.25		
	LT level	0.43	0.37	0.88
Wheeling Loss Compensation	33kV	6%	0.66%	1.5%
	22/11kV	9%		9.0%
	LT level	14%		
Cross Subsidy Surcharge		NIL	NIL	NIL
Additional Surcharge	TO BE DECIDED ON CASE TO CASE BASIS			
Default Service Charges*	Rs/month/ connection	200**	200	200
	Rs/kWh	10.00**	9.00	11.00
Balancing Market Charge	On Marginal Pricing basis as per Intra-State ABT Order, Currently applicable only for full TOAU (Transmission Open Access Users)			

* Default Service Charges have been considered same as HT Temporary Tariff. In case of LT the applicable charges should be as specified in the APR Order for FY 2009-10 for the respective Distribution Utilities.

** Additional fixed charges of Rs. 150 per 10 kW load or part thereof above 10 kW load shall be payable.

The working for Sample Illustration is given in the following **Table 1.6**.

Table 1.6: Background workings for the Sample Illustration

Parameters	Case 1	Case 2	Case 3	Case 4
Generator Voltage(kV) (injection Point)	132	132	132	132
Consumer Voltage (kV) (drawal point)	132	33	11	LT
Open access at generator end (MW)	25.00	25.00	25.00	25
Load Factor %	80	80	80	80
Energy Injected (Mu)	14.40	14.40	14.40	14.40
Nature of Open Access	Short-Term	Short-Term	Short-Term	Short-Term
Cost of Generation (Rs/kWh)	2.50	2.50	2.50	2.50
MSEDCL				
Energy Drawn at Transmission end (MU)	13.70	13.70	13.70	13.70
Energy Drawn at consumer end (MU)	13.70	12.88	12.47	11.78
Amount Paid to generator (Rs Mn)	36.00	36.00	36.00	36.00
Transmission Charge (Rs. Mn)	0.70	0.70	0.70	0.70
Wheeling Charge (Rs Mn)	0.00	0.69	3.43	5.89
Cross-subsidy surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Additional surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Total Charges Paid	36.70	37.38	40.12	42.59
Effective Rate (Rs/kWh)	2.68	2.90	3.22	3.61
TPC				
Energy Drawn at Transmission end (MU)	13.70	13.70	13.70	13.70
Energy Drawn at consumer end (MU)	13.70	13.61	13.61	13.61
Amount Paid to generator (Rs Mn)	36.00	36.00	36.00	36.00
Transmission Charge (Rs. Mn)	0.70	0.70	0.70	0.70
Wheeling Charge (Rs Mn)	0.00	6.30	2.47	5.07
Cross-subsidy surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Additional surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Total Charges Paid	36.70	43.00	39.16	41.77
Effective Rate (Rs/kWh)	2.68	3.16	2.88	3.07
REL				
Energy Drawn at Transmission end (MU)	13.70	13.70	13.70	13.70
Energy Drawn at consumer end (MU)	13.70	13.50	13.50	12.47
Amount Paid to generator (Rs Mn)	36.00	36.00	36.00	36.00
Transmission Charge (Rs. Mn)	0.70	0.70	0.70	0.70
Wheeling Charge (Rs Mn)	0.00	6.30	6.30	12.06
Cross-subsidy surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Additional surcharge (Rs Mn)	0.00	0.00	0.00	0.00
Total Charges Paid	36.70	43.00	43.00	48.76
Effective Rate (Rs/kWh)	2.68	3.19	3.19	3.91