

OPEN ACCESS WHEELING: SAMPLE ILLUSTRATION AND EXPLANATORY NOTE

A] EXPLANATORY NOTE:

1. **Applicability of Wheeling Charge:** The Commission under its MYT Order (Case 65 of 2006) dated May 18, 2007 for determination of Tariff for FY 2007-08 in respect of MSEDCL has clarified the issue of applicability of wheeling charges for open access wheeling transactions as under:

“6.6 APPLICABILITY OF WHEELING CHARGES AND WHEELING LOSS FOR OPEN ACCESS TRANSACTIONS

The Commission prescribes that the distribution system users who are eligible for open access to the distribution system of MSEDCL in accordance with the Distribution Open Access Regulations, 2005 would be required to pay the wheeling charges and bear wheeling losses in kind as determined in this Order. Further, such distribution open access users (DOAU) would also be required to pay transmission charges and bear transmission losses in kind; in case intra-State transmission system is being used for the purpose of their open access wheeling transactions.

Further, the Commission is of the opinion that all open access contracts in existence on the date of enactment of the Electricity Act (EA 2003) should be honoured, to ensure sanctity of the contract. The Commission rules that all open access transactions on the date of effectiveness of the EA 2003 shall be required to pay the wheeling charges as mentioned in their contract till the current validity of such contract and upon expiry of the current contract, these consumers would also be subjected to the wheeling charges determined by the Commission from time to time.

Wheeling charges shall also be applicable for such consumers/person who has a captive generating plant and seeks open access to the distribution network of the distribution licensee for the purposes of wheeling electricity from his captive generating plant to the destination of his own use.

However, it is clarified that the consumers connected directly to the transmission network or transmission open access users (TOAU) would not be required to pay the wheeling charges, if the distribution licensee's network is not being utilised for the energy wheeling transaction and such TOAU would require to pay only transmission charges and bear transmission loss in kind for their open access wheeling transactions.” (Ref. Cl 6.6, Page 184/185 of Order (Case 65 of 2006) dated May 18, 2007”).

2. **Wheeling charge for MSEDCL network:** The Commission has determined the wheeling charges and wheeling loss under MYT Order as under: (*ref. cl. 6.5 page 183 of Order in Case 65 of 2006*)

Voltage Level	Wheeling Charge
	(Rs/kW/month)
132 kV	Nil
33 kV	38
22 kV / 11 kV	245

3. **Wheeling loss for MSEDCL network:** The Commission has ruled that wheeling losses applicable for open access transactions entailing drawal at 33 kV level is 6%, and that for drawal at 22 kV or 11 kV is 9%. (*ref. cl. 6.5 page 184 of Order in Case 65 of 2006*)

4. **Transmission Tariff for InSTS:** In addition, the Commission has separately determined transmission tariff for use of InSTS under its Transmission Tariff Order (Case 86 of 2006) for FY 2007-08 as under: (*ref. cl. 11 page 4 of Order in Case 86 of 2006*)

Item Description	Units	FY 2007-08
Transmission Tariff (long term)	Rs/kW/mth	126.86
Transmission Tariff (long term)	Rs/MW/day	4171
Transmission Tariff (short term)	Rs/MW/day	1042.75

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

*The Transmission Tariff for short term open access transactions for the first year of the MYT Control Period, i.e., FY 2007-08 shall be **Rs 1042.75 per MW per day or Rs 43.45 per MW per hour** Further, it is clarified that as stipulated under clause 3.2.5.6 of Order for Transmission Pricing Framework, 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.*

5. **Transmission Loss for InSTS:** Based on CPRI study, the Commission has approved transmission loss for InSTS at 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. 21 page 8 of Order in Case 86 of 2006 and cl 26, 27 of Order in Case 31 of 2006.*)

6. **Wheeling charge and wheeling loss for TPC-D:** The Commission has determined wheeling charges and wheeling loss for use of distribution network of TPC-D as under: (*ref. cl. 6.4 page 67 of Order in Case 70 of 2006*)

Wheeling charge : Rs 111 per kW per month
Wheeling loss : 2.93%

7. **Wheeling charge and wheeling loss for REL-D:** The Commission has determined wheeling charges and wheeling loss for use of distribution network of REL-D as under: (*ref. page 74, 75 of Order in Case 75 of 2006*)

Wheeling charge & Wheeling Loss :

Category	Commission Approved	
	Wheeling Charge (Rs/kVA/month)	Wheeling Loss (%)
HT Category	118.40	2.40%
LT Category	273.86	12.66%

8. Depending on nature of open access wheeling transactions, the injection point(s) and drawal point(s) for the open access wheeling transactions 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 licensee, 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 extent of use of assets of the concerned licensee and extent of use at a particular voltage level.

9. A summary of applicable transmission charge, transmission loss, wheeling charge and wheeling loss for various cases of open access wheeling transactions is presented below in tabular form for ease of understanding.

10. Summary of transmission tariff and wheeling charges is given in the Tables below:

Table 1.1: Consolidated table for Transmission Tariff and Wheeling charges

Transmission Charge & Transmission Loss		Transmission charge	Transmission Loss	
InSTS Transmission Tariff (Long term)	Rs/kW/month	126.86	4.85%	Ref. MERC Tx Tariff Order (FY07-08), (Case 86 of 2006) Cl. 11 Pg 5
InSTS Transmission Tariff (Short term)	Rs/kW/month	31.72	4.85%	
Wheeling Charges & Wheeling Losses		Wheeling charge	Wheeling loss	
MSEDCL				
- 132 kV	Rs/kW/month	0	0%	Ref. MERC MYT Order for MSEDCL (FY07-08), (Case 65 of 2006) Cl. 6.5 & 6.6 Pg 183/184
- 33 kV	Rs/kW/month	38	6%	
- 22 kV / 11 kV	Rs/kW/month	245	9%	
TPC-D				
- 33 kV / 22 kV / 11 kV (HT)	Rs/kW/month	111	2.93%	Ref. MERC MYT Order for TPC-D (FY07-08), (Case 70 of 2006) Cl. 6.4 Pg 65/66/67
REL				
- 33 kV / 22 kV / 11 kV (HT)	Rs/kVA/month	118.4	2.40%	Ref. MERC MYT Order for REL-D (FY07-08), (Case 75 of 2006) Table 42/43 Pg 75/76

Nomenclature used for wheeling charge and wheeling losses 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 charges and wheeling losses of 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_11kV	M_{wc11}	M_{wl11}
TPC_HT	$T_{wc}ht$	$T_{wl}ht$
REL_HT	$R_{wc}ht$	$R_{wl}ht$

Table 1.3 Applicable Wheeling Charge for OA wheeling transaction with different Injection Point(s) and Drawal point(s)

Table for Wheeling Cost		Rs/kW/mth	M_{wc132}	M_{wc33}	M_{wc11}	$T_{wc}ht$	$R_{wc}ht$
		Injection	I1	I2	I3	I4	I5
Rs/kW/mth	Drawal		MSE_132kV	MSE_33kV	MSE_11kV	TPC_HT	REL_HT
M_{wc132}	D1	MSE_132kV	0	M_{wc33}	M_{wc11}	$T_{wc}ht$	$R_{wc}ht$
M_{wc33}	D2	MSE_33kV	M_{wc33}	M_{wc33}	M_{wc11}	$M_{wc33}+T_{wc}ht$	$M_{wc33}+R_{wc}ht$
M_{wc11}	D3	MSE_11kV	M_{wc11}	M_{wc11}	M_{wc11}	$M_{wc11}+T_{wc}ht$	$M_{wc11}+R_{wc}ht$
$T_{wc}ht$	D4	TPC_HT	$T_{wc}ht$	$M_{wc33}+T_{wc}ht$	$M_{wc11}+T_{wc}ht$	$T_{wc}ht$	$T_{wc}ht+R_{wc}ht$
$R_{wc}ht$	D5	REL_HT	$R_{wc}ht$	$M_{wc33}+R_{wc}ht$	$M_{wc11}+R_{wc}ht$	$T_{wc}ht+R_{wc}ht$	$R_{wc}ht$

Table for Wheeling Cost		Rs/kW/mth	<u>0</u>	<u>38</u>	<u>245</u>	<u>111</u>	<u>118.4</u>
		Injection	I1	I2	I3	I4	I5
Rs/kW/mth	Drawal		MSE_132kV	MSE_33kV	MSE_11kV	TPC_HT	REL_HT
<u>0</u>	D1	MSE_132kV	0	38	245	111	118.4
<u>38</u>	D2	MSE_33kV	38	38	245	149	156.4
<u>245</u>	D3	MSE_11kV	245	245	245	356	363.4
<u>111</u>	D4	TPC_HT	111	149	356	111	229.4
<u>118.4</u>	D5	REL_HT	118.4	156.4	363.4	229.4	118.4

In addition to above wheeling charge, transmission charges (long-term or short-term), as the case may be, 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 OA wheeling transaction with different Injection Point(s) and Drawal point(s)

Table for Wheeling loss		%	M _{wl} 132	M _{wl} 33	M _{wl} 11	I _{wl} ht	R _{wl} ht
		Injection	I1	I2	I3	I4	I5
%	Drawal		MSE_132kV	MSE_33kV	MSE_11kV	TPC_HT	REL_HT
M _{wl} 132	D1	MSE_132kV	0	M _{wl} 33	M _{wl} 11	T _{wl} ht	R _{wl} ht
M _{wl} 33	D2	MSE_33kV	M _{wl} 33	M _{wl} 33	M _{wl} 11	M _{wl} 33+T _{wl} ht	M _{wl} 33+R _{wl} ht
M _{wl} 11	D3	MSE_11kV	M _{wl} 11	M _{wl} 11	M _{wl} 11	M _{wl} 11+T _{wl} ht	M _{wl} 11+R _{wl} ht
T _{wl} ht	D4	TPC_HT	T _{wl} ht	M _{wl} 33+T _{wl} ht	M _{wl} 11+T _{wl} ht	T _{wl} ht	T _{wl} ht+R _{wl} ht
R _{wl} ht	D5	REL_HT	R _{wl} ht	M _{wl} 33+R _{wl} ht	M _{wl} 11+R _{wl} ht	T _{wl} ht+R _{wl} ht	R _{wl} ht

Table for Wheeling Loss		%	0%	6%	9%	2.93%	2.40%
		Injection	I1	I2	I3	I4	I5
%	Drawal		MSE_132kV	MSE_33kV	MSE_11kV	TPC_HT	REL_HT
0%	D1	MSE_132kV	0.00%	6.00%	9.00%	2.93%	2.40%
6%	D2	MSE_33kV	6.00%	6.00%	9.00%	8.93%	8.40%
9%	D3	MSE_11kV	9.00%	9.00%	9.00%	11.93%	11.40%
2.93%	D4	TPC_HT	2.93%	8.93%	11.93%	2.93%	5.33%
2.40%	D5	REL_HT	2.40%	8.40%	11.40%	5.33%	2.40%

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.

11. Sample illustration in respect of following case scenarios of open access wheeling transaction is summarised in the following pages.

- Ø Case Scenario -1 : Injection at 132 kV (InSTS) and Drawal at 132 kV (InSTS)
- Ø Case Scenario-2 : Injection at 132 kV (InSTS) and Drawal at 33 kV (MSEDCL)
- Ø Case Scenario-3 : Injection at 132 kV (InSTS) and Drawal at 11 kV (MSEDCL)
- Ø Case Scenario-4 : Injection at 132 kV (InSTS) and Drawal at HT (TPC)
- Ø Case Scenario-5 : Injection at 132 kV (InSTS) and Drawal at HT (REL)

Assumptions for the purpose of Sample Illustration

- Open Access wheeling capacity - 25 MW
- Load factor/capacity utilisation factor - 80%
- Cost of OA generation (ex-Bus) - Rs 2.50 per kWh

B] SAMPLE ILLUSTRATION

12. 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 summarised in the following **Table 1.5**. The workings for effective landed cost takes into consideration applicable transmission tariff, transmission loss, wheeling charge and wheeling loss as elaborated under earlier paragraphs 10.

Table-1.5: Sample Illustration for 25 MW Short term Open Access wheeling transaction

Charges as per April 2007 Orders		MSEDCL	REL	TPC
Transmission Charge (Rs./kW/month)	short term**	31.72	31.72	31.72
	long term	126.86	126.86	126.86
Transmission Loss Compensation		4.85%	4.85%	4.85%
Wheeling Charges (Rs./kW/month)#	33kV	38		
	22/11kV	245	120.82	111
Wheeling Loss Compensation	33kV	6%		
	22/11kV	9%	2.40%	2.93%
Cross-subsidy Surcharge		nil	nil	nil
Additional Surcharge	TO BE DECIDED ON CASE TO CASE BASIS			
Default Service Charges*	Rs./month/con nection)	250	200	
	Rs./kWh	10.50	10.50	
Balancing Market Charge	On Marginal Pricing basis as per Intra-State ABT Order, currently applicable only for full TOAU (Transmission Open Access Users)			

Description of the Case	Unit	Case 1	Case 2	Case 3
Generator Voltage (Injection Point)	kV	132	132	132
Consumer Voltage (Drawal point)	kV	132	33	11
OA at generator end	MW	25	25	25
Load Factor	%	80%	80%	80%
Energy Injected	MU	14.4	14.4	14.4
Nature of OA	ST/LT	ST	ST	ST
Cost of generation	Rs./ kWh	2.5	2.5	2.5
Effective Rate for Consumers				
MSEDCL	Rs./ kWh	2.69	2.93	3.44
REL	Rs./ kWh	2.69	2.98	2.98
TPC	Rs./ kWh	2.69	2.98	2.98

Notes:

* Default Service Charges have been considered same as HT temporary tariff

Wheeling charges in case of REL has been referred under Order in terms of Rs./kVA/month, (@ Rs. 118.4/kVA/mth), however, for purpose of sample illustration the same is considered at Rs./kW/month assuming power factor of 0.98

** Long term Transmission charges for InSTS are Rs. 126.86/kW/month

(Reactive power charges shall be applicable as outlined under Transmission Pricing Framework Order)

Table 1.6 : Background workings for the Sample Illustration

Parameter Description	Case 1	Case 2	Case 3
Generator Voltage (kV) (injection point)	132	132	132
Consumer Voltage (kV) (drawal point)	132	33	11
OA at generator end (MW)	25	25	25
Load Factor (%)	80%	80%	80%
Energy Injected (MU)	14.4	14.4	14.4
Nature of OA	ST	ST	ST
Cost of generation (Rs/ kWh)	2.5	2.5	2.5
MSEDCL			
Energy Drawn at Tx end(MU)	13.70	13.70	13.70
Energy Drawn at consumer end(MU)	13.70	12.88	12.47
Amount paid to generator (Rs Mn)	36.00	36.00	36.00
Transmission Charges (Rs Mn)	0.79	0.79	0.79
Wheeling Charges (Rs Mn)	0	0.95	6.13
Cross-subsidy surcharge (Rs Mn)	0	0.00	0
Additional Surcharge (Rs Mn)	0	0.00	0
Total Charges Paid (Rs Mn)	36.79	37.74	42.92
Effective Rate (Rs/kWh)	2.69	2.93	3.44
REL			
Energy Drawn at Tx end(MU)	13.70	13.70	13.70
Energy Drawn at consumer end(MU)	13.70	13.37	13.37
Amount paid to generator (Rs Mn)	36.00	36.00	36.00
Transmission Charges (Rs Mn)	0.79	0.79	0.79
Wheeling Charges (Rs Mn)	0	3.02	3.02
Cross-subsidy surcharge (Rs Mn)	0	0.00	0
Additional Surcharge (Rs Mn)	0	0.00	0
Total Charges Paid (Rs Mn)	36.79	39.81	39.81
Effective Rate (Rs/kWh)	2.69	2.98	2.98
TPC			
Energy Drawn at Tx end(MU)	13.70	13.70	13.70
Energy Drawn at consumer end(MU)	13.70	13.30	13.30
Amount paid to generator (Rs Mn)	36.00	36.00	36.00
Transmission Charges (Rs Mn)	0.79	0.79	0.79
Wheeling Charges (Rs Mn)	0.00	2.78	2.78
Cross-subsidy surcharge (Rs Mn)	0.00	0.00	0.00
Additional Surcharge (Rs Mn)	0.00	0.00	0.00
Total Charges Paid (Rs Mn)	36.79	39.57	39.57
Effective Rate (Rs/kWh)	2.69	2.98	2.98

Sd/-
(P. B. Patil)
Secretary, MERC