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 Tariff Order for FY 2009-10 (In Case of REL-D) and FY 2010-11(In Case of MSEDCL,TPC-D) 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 111 of 2009: APR Order for MSEDCL for FY 2010-11
    - Case 98 of 2009 : APR Order for TPC-D for FY 2010-11
    - Case 121 of 2008 : APR Order for REL-D for FY 2009-10
    - Case 120 of 2009: APR Order for Transmission Tariff for InSTS for FY 2010-11.

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 2010-11as under:
   (Ref. Cl 5.6, Page 202/234 of Order in Case No 111 of 2009)

Voltage Level	Wheeling Charges(Rs./kWh)	Wheeling Loss (%)
33kV	0.04	6%
22 kV/11kV	0.21	9%
LT Level	0.36	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 120 of 2009) for FY 2010-11 as under: ***(ref. cl. 10 page 6/12 of Order in Case 120of 2009)***

Item Description	Units	FY 2010-11
Transmission Tariff(Long-term)	Rs/kW/month	164.68
Transmission Tariff(Long-term)	Rs/MW/day	5414
Transmission Tariff(short-term)	Rs/MW/day	1353.50
Transmission Tariff(short-term)	Rs/MWh	56.40

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

"12. Accordingly, Transmission Tariff for short-term open access transactions for FY 2010-11, shall be Rs 56.40 per MW per hour. Further, it is clarified as ruled under Commission's Order (Case 103 of 2009) that condition as stipulated under Para 3.2.5.6 reproduced above that short term transmission charges to be payable for minimum 6 hours duration within a day ***shall no longer be applicable*** *and the short term open access charges shall be denominated in Rs/MWh as outlined above. 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 2010-11 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 under its Order in Case No. 98 of 2009 dated September 12, 2010 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. 6.7 page 163/194 of Order in Case No 98 of 2009)***

Item Description	Wheeling Charge(Rs/kWh)	Wheeling Loss(%)
HT level	0.19	0.65%
LT level	0.38	0.65%

6. **Wheeling Charge and Wheeling loss REL-D:**

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 drawl 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 Charges and Transmission loss	Units	Transmission Charges	Transmission Loss (%)	Reference of Order
Transmission Tariff(Long-term)	Rs/kW/month	164.68	4.85	MERC Transmission Tariff Order (FY 2010-11), (Case No. 120 of 2009)Cl. 10 of page
Transmission Tariff(Long-term)	Rs/MW/day	5414	4.85	
Transmission Tariff(short-term)	Rs/MW/day	1353.50	4.85	
Transmission Tariff(short-term)	Rs/MWh	56.40	4.85	

Wheeling Charges and Wheeling losses		**Wheeling Charges**	**Wheeling loss**	
MSEDCL	Rs/kWh			
-132kV	Rs/kWh	0	0%	(Ref. Cl 5.6, Page 202/234 of Order in Case No 111 of 2009)
-33kV	Rs/kWh	0.04	6%	
-22kV/11kV	Rs/kWh	0.21	9%	
LT level	Rs/kWh	0.36	14%	
TPC-D	Rs/kWh			(ref. cl. 6.7 page 163/194 of Order in Case No 98 of 2009)
-33Kv/22 kV/11kV(HT)	Rs/kWh	0.19	0.65%	
LT level	Rs/kWh	0.38	0.65%	
REL-D	Rs/kWh			
-33kV/22kV/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	$M_{wc}132$	$M_{wl}132$
MSEDCL_33 kV	$M_{wc}33$	$M_{wl}33$
MSEDCL_11 Kv	$M_{wc}11$	$M_{wl}11$
MSEDCL_LT	$M_{wc}lt$	$M_{wl}lt$
TPC_HT	$T_{wc}ht$	$T_{wl}ht$
TPC_LT	$T_{wc}lt$	$T_{wl}lt$
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_ 132 kV**	**MSE_** 33kV	MSE_1 1V	**MSE_ LT**	**TPC_H T**	**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_{wclt}	D4	**MSE_LT**	M_{wclt}	M_{wclt}	M_{wclt}	M_{wclt}	M_{wclt}+ T_{wcht}	M_{wclt}+ T_{wclt}	M_{wclt} + R_{wcht}	M_{wclt} + R_{wclt}
T_{wcht}	D5	**TPC_HT**	T_{wcht}	M_{wc33} + T_{wcht}	M_{wc11}+ T_{wcht}	M_{wclt}+ T_{wcht}	T_{wcht}	T_{wclt}	T_{wcht} + R_{wcht}	T_{wcht} + R_{wclt}
T_{wclt}	D6	**TPC_LT**	T_{wclt}	M_{wc33} + T_{wclt}	M_{wc11}+ T_{wclt}	M_{wclt}+ R_{wcht}	T_{wclt}	T_{wclt}	T_{wclt} + R_{wcht}	T_{wclt} R_{wclt}
R_{wcht}	D7	**REL_HT**	R_{wcht}	M_{wc33} + R_{wcht}	M_{wc11}+ R_{wcht}	M_{wclt}+ R_{wcht}	T_{wcht}+ R_{wcht}	T_{wclt}+ R_{wcht}	R_{wcht}	R_{wclt}
R_{wclt}	D8	**REL_LT**	R_{wclt}	M_{wc33} + R_{wclt}	M_{wc11}+ R_{wclt}	M_{wclt}+ R_{wclt}	T_{wcht}+ R_{wclt}	T_{wclt}+ R_{wclt}	R_{wclt}	R_{wclt}

Table for Wheeling Cost		**Rs/kWh**	**0**	**0.04**	**0.21**	**0.36**	**0.19**	**0.38**	**0.46**	**0.88**
		Injection	I1	I2	I3	I4	I5	I6	I7	I8
Rs/kWh	Drawal		**MSE_ 132 kV**	**MSE_ 33kV**	**MSE_ 11kV**	**MSE_ LT**	**TPC_ HT**	**TPC_ LT**	**REL_ HT**	**REL_ LT**
0	D1	**MSE_132k V**	0	0.04	0.21	0.36	0.19	0.38	0.46	0.88
0.04	D2	**MSE_33kV**	0.04	0.04	0.21	0.36	0.23	0.42	0.5	0.92
0.21	D3	**MSE_11kV**	0.21	0.21	0.21	0.36	0.4	0.59	0.67	1.09
0.36	D4	**MSE_LT**	0.36	0.36	0.36	0.36	0.55	0.74	0.82	1.24
0.19	D5	**TPC_HT**	0.19	0.23	0.4	0.55	0.19	0.38	0.65	1.07
0.38	D6	**TPC_LT**	0.38	0.42	0.59	0.82	0.38	0.38	0.84	1.26
0.46	D7	**REL_HT**	0.46	0.5	0.67	0.82	0.65	0.84	0.46	0.88
0.88	D8	**REL_LT**	0.88	0.92	1.09	1.24	1.07	1.26	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)

		Injection	I1	I2	I3	I4	I5	I6	I7	I8
%	Drawal		**MSE_ 132 kV**	**MSE_ 33kV**	**MSE_1 1kV**	**MSE_ LT**	**TPC_H T**	**TPC_ LT**	**REL _HT**	**REL _LT**
Mwl132	D1	**MSE_132k V**	0	Mwl33	Mwl11	Mwllt	Twlht	Twllt	Rwlh t	Rwllt
Mwl33	D2	**MSE_33kV**	Mwl33	Mwl33	Mwl11	Mwllt	Twlht+ Mwl33	Twllt +Mwl 33	Rwlh t+ Mwl 33	Rwllt + Mwl 33
Mwl11	D3	**MSE_11kV**	Mwl11	Mwl11	Mwl11	Mwllt	Twlht+ Mwl11 +	Twllt+ Mwl1 1	Rwlh t+ Mwl 11+	Rwllt + Mwl 11
Mwllt	D4	**MSE_LT**	Mwllt	Mwllt	Mwllt	Mwllt	Twlht +Mwllt	Twllt +Mwll t	Rwlh t +Mw llt	Rwllt +Mw llt
Twlht	D5	**TPC_HT**	Twlht	Mwl33 + Twcht	Mwl11 + Twcht	Mwllt + Twcht	Twlht	Twllt	Rwlh t +Twl ht	Rwllt +Twl ht
Twllt	D6	**TPC_LT**	Twllt	Mwl33 + Twclt	Mwl11 + Twclt	Mwllt + Twclt	Twllt	Twllt	Rwlh t +Twl lt	Rwllt +Twl lt
Rwlht	D7	**REL_HT**	Rwlht	Mwl33 + Rwlht	Mwl11 + Rwlht	Mwllt + Rwlht	Twlht+ Rwlht	Twllt+ Rwlht	Rwlh t	Rwllt
Rwllt	D8	**REL_LT**	Rwllt	Mwl33 + Rwllt	Mwl11 + Rwllt	Mwllt + Rwllt	Twlht+ Rwllt	Twllt+ Rwllt	Rwllt	Rwllt

Table for Wheeling loss		%	0%	6%	9%	14%	0.65%	0.65%	1.5%	9%
		Injection	I1	I2	I3	I4	I5	I6	I7	I8
%	Drawal		MSE_132 kV	MSE_33kV	MSE_11kV	MSE_LT	TPC_HT	TPC_LT	REL_HT	REL_LT
0	D1	MSE_132kV	0	6%	9%	14%	0.65%	0.65%	1.5%	9.00%
6%	D2	MSE_33kV	6%	6%	9%	14%	6.65%	6.65%	7.5%	15.00%
9%	D3	MSE_11kV	9%	9%	9%	14%	9.65%	9.65%	10.5%	18.00%
14%	D4	MSE_LT	14%	14%	14%	14%	14.65%	14.65%	15.5%	23.00%
0.65%	D5	TPC_HT	0.65%	6.65%	9.65%	14.65%	0.65%	0.65%	2.15%	9.65%
0.65%	D6	TPC_LT	0.65%	6.65%	9.65%	14.65%	0.65%	0.65%	2.15%	9.65%
1.5%	D7	REL_HT	1.5%	8%	11%	16%	2.15%	2.15%	1.5%	9.00%
9.00%	D8	REL_LT	9.00%	15.00%	18.00%	23.00%	9.65%	9.65%	9.00%	9.00%

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%
Cost of OA generation (ex-bus)	-	Rs. 2.25 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	**Short-term(Rs/MWh)**	56.40		
	Long-term (Rs/kW/month)	164.68		
Transmission loss Compensation		4.85%		
Wheeling Charges (Rs./kWh)	33kV	0.04		
	22/11kV	0.21	0.19	0.46
	LT level	0.36	0.38	0.88
Wheeling Loss Compensation	33kV	6%		
	22/11kV	9%		1.50%
	LT level	14%	0.65%	9%
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	10.12**	9.00	11.00
Balancing Market Charges	On Marginal Pricing basis as per Intra-State ABT Order, Currently applicable only for full TOAU(Transmission Open Access Uses)			

* 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	25	25	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)	**2.25**	**2.25**	**2.25**	**2.25**
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)	32.4	32.4	32.4	32.4
Transmission Charge (Rs. Mn)	0.81216	0.81216	0.81216	0.81216
Wheeling Charge (Rs Mn)	0	0.55	2.88	4.93
Cross-subsidy surcharge (Rs Mn)	0	0	0	0
Additional surcharge (Rs Mn)	0	0	0	0
Total Charges Paid	33.2	33.8	36.1	38.1
Effective Rate (Rs/kWh)	**2.42**	**2.62**	**2.89**	**3.24**
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)	32.4	32.4	32.4	32.4
Transmission Charge (Rs. Mn)	0.81216	0.81216	0.81216	0.81216
Wheeling Charge (Rs Mn)	0	2.60	2.60	5.21
Cross-subsidy surcharge (Rs Mn)	0	0	0	0
Additional surcharge (Rs Mn)	0	0	0	0
Total Charges Paid	33.2	35.8	35.8	38.4
Effective Rate (Rs/kWh)	**2.42**	**2.63**	**2.63**	**2.82**
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)	32.4	32.4	32.4	32.4
Transmission Charge (Rs. Mn)	0.81216	0.81216	0.81216	0.81216

Wheeling Charge (Rs Mn)	0	6.30	6.30	12.05
Cross-subsidy surcharge (Rs Mn)	0	0	0	0
Additional surcharge (Rs Mn)	0	0	0	0
Total Charges Paid	33.21	39.51	39.51	45.26
Effective Rate (Rs/kWh)	**2.42**	**2.93**	**2.93**	**3.63**