



# KERALA STATE ELECTRICITY REGULATORY COMMISSION

KPFC BHAVANAM, C.V. RAMAN PILLAI ROAD, VELLAYAMBALAM,  
THIRUVANANTHAPURAM, KERALA, PIN 695 010

Phone: 0471 273 5544, FAX 0471 273 5599, Website: [www.erckerala.org](http://www.erckerala.org)

E-mail: [kserc@erckerala.org](mailto:kserc@erckerala.org)

No 59/CT/KSERC/2013

30<sup>th</sup> January, 2014

## Notice

In the order dated 31-05-2013 of Hon Appellate Tribunal for Electricity (APTEL) on appeal No 179 of 2012 filed by the Kerala High Tension and Extra High Tension Industrial Electricity Consumer's Association, the following directions were issued by the Hon APTEL, with regard to the tariff order issued by the KSERC applicable to KSEB for the year 2012-13

"80. Summary of our findings: "i) We find that in the present case, the State Commission has determined the tariff of the Appellant's category of HT and EHT Industrial consumers within  $\pm$  20% of the average cost of supply as per the Tariff Policy, the dictum laid down by this Tribunal and as sought by the Appellant in their objections filed before the State Commission. However, we give directions to the State Commission to determine the voltage-wise cost of supply for the various categories of consumers within six months of passing of this order and take that into account in determining the cross subsidy and tariffs in future as per the dictum laid down by this Tribunal."

In accordance with the directions referred above the Commission is publishing the following proposal - A model for the estimation of voltage wise cost of supply (Annexure-I) proposed by KSEB for estimation of cost at different voltages based on the above principles and applying the data of provisional accounts for the year 2012-13.

Commission invites comments from stake holders on the above proposal so as to reach this office on or before 28/2/2014 .

Commission has decided that a public hearing shall be held on the above proposal at 11.00 am on 18.3.2014 at the office of the Commission to hear the response of stake holders on the proposal. The proposal is published in the web site of the Commission viz [www.erckerala.org](http://www.erckerala.org).

Secretary

## **Annexure-I**

### **A model for estimation of Voltage wise Cost of Supply**

Hon. Appellate Tribunal for Electricity, New Delhi in its Order dated 31-5-2013 in Appeal No. 179 of 2012 has directed the Kerala State Electricity Regulatory Commission to determine the voltage wise cost of supply for various categories of consumers within 6 months, and to take it in to account in determining the cross subsidy and tariffs in future. The Tribunal has directed to follow the principles laid down as per the Order in M/s Tata Steel Limited Vs OERC dated 30-5-2011. In para 34 of the said order, the principles for determination of voltage wise cost of supply is given as shown below:

*“34. Thus Power Purchase Cost which is the major component of tariff can be segregated for different voltage levels taking into account the transmission and distribution losses, both commercial and technical, for the relevant voltage level and upstream system. As segregated network costs are not available, all the other costs such as Return on Equity, Interest on Loan, depreciation, interest on working capital and O&M costs can be pooled and apportioned equitably, on pro-rata basis, to all the voltage levels including the appellant’s category to determine the cost of supply. Segregating Power Purchase cost taking into account voltage-wise transmission and distribution losses will be a major step in the right direction for determining the actual cost of supply to various consumer categories. All consumer categories connected to the same voltage will have the same cost of supply. Further, refinements in formulation for cost of supply can be done gradually when more data is available. “*

As per the above order, the voltage wise cost of supply may be estimated first based on estimating the power purchase/generation cost at various voltage levels considering the losses in the system. The other costs such as the net work costs can be apportioned at the different voltage levels appropriately so as to arrive at the cost at voltage levels approximately. The APTEL has also directed in the Order dated 31-5-2013 that for determining the cross subsidy at the voltage level, the voltage wise cost of supply is to be used. Accordingly, the Commission has sought the energy flow details for the latest year from KSEB and based on the data submitted by KSEB estimates the voltage wise cost for 2012-13. The purpose here is to arrive a valid methodology for determining the voltage level cost of supply for various consumer categories. Once the methodology is finalised, the same can be used for estimating the voltage level cost of supply for the relevant year, based on the data for that year.

As per the details furnished by KSEB, the voltage wise energy flow is as shown below

**Table 1: Energy flow in the Kerala System (2012-13)**

	As per the Data given by KSEB (MU)	
<b>Energy Generated</b>	<b>5383</b>	
Auxiliary Consumption	61	
<b>Energy Transferred from internal generation</b>	<b>5328</b>	
<b>Energy Purchased</b>	<b>14917</b>	
External loss	365	
Inter-State sales	0	
Energy Input at State periphery	14552	
<b>Total Energy available in the System</b>	<b>19890</b>	
Transmission loss	895	4.50%
Sales at EHT level	1791	
<b>Energy transferred to HT system</b>	<b>17194</b>	
Distribution loss (HT level)	1203.55	7.00%
Sales at HT level	2788	
<b>Energy Transferred to LT system</b>	<b>13202</b>	
Distribution loss (LT level)	943	7.14%
Sales at LT level	12259	
Distribution loss (HT+LT)	2147	
Total Losses		3042
		15.30 %

In the above calculation the Board has assumed 4.5% as transmission loss and 10.8% as Distribution loss.

**Table 2 : Voltage wise energy flow**

	EHT (220kV/110kV/ 66kV)	HT (33kV/11kV)	LT (Below 11kV)	Total
<b>Loss (%)</b>	<b>4.5%</b>	<b>7.00%</b>	<b>7.14%%</b>	<b>15.30%</b>
Loss (MU)	895	1204	943	<b>3,042</b>
Sales	1791	2788	12259	<b>16838</b>
Energy usage (Sales+Loss)	2,686	3,992	13,202	<b>19880</b>
Energy Transferred	18,985	15,990	12,259	

As per the provisional accounts for 2012-13, the total costs at various functional levels is given in the Statement 6 of provisional annual accounts for 2012-13. The total expenses in the accounts are segregated in to six functional levels (generation, transmission, distribution, construction, stores, and management and administration). The expenses in construction, stores and management & administration have to be apportioned to the major functional levels such as generation, transmission and distribution for estimating the voltage level costs. The percentage of GFA in each functional unit is proposed to be taken as a proxy for apportioning the common expenses.

**Table 4 Functional Apportionment of costs (Rs Crores)**

	Generation	Transmission	Distribution	Construction	Stores organisation	Management & administration	Total
Cost of fuel	563.65						563.65
Other expenses	162.16	346.67	2,182.53	(20.86)	15.77	695.12	3,381.39
Purchase of power	7,199.61						7,199.61
RoE	62.23	66.22	88.97				217.42
<b>Total expenses</b>	<b>7,987.65</b>	<b>412.89</b>	<b>2,271.50</b>	<b>(20.86)</b>	<b>15.77</b>	<b>695.12</b>	<b>11,362.07</b>
<b>Apportionment</b>							
Construction	(5.97)	(6.35)	(8.54)				(20.86)
Stores Organisation	4.51	4.80	6.45				15.76
Management & Admn	198.96	211.72	284.44				695.12
<b>Total Expenses</b>	<b>8,185.15</b>	<b>623.06</b>	<b>2,553.85</b>				<b>11,362.06</b>
<b>Apportionment of Non-Tariff income</b>							
Non-Tariff income	4.30	10.67	299.17	5.53	2.08	114.07	435.82
Non-tariff income (Construction)	1.58	1.68	2.26	5.53			
Non-tariff income (stores)	0.60	0.63	0.85	2.08	3.49		
Non-tariff income (M&A)	32.65	34.74	46.68	114.07			
Non-Tariff income -Total	39.13	47.73	348.96	435.82			435.82
<b>Net expenses</b>	<b>8,146.02</b>	<b>575.33</b>	<b>2,204.89</b>				<b>10,926.24</b>

In the above calculation, the RoE, Construction, Stores, Administration etc are apportioned to various functional units, based upon their proportionate share in GFA, as provided in Table 5.

**Table 5. Function wise GFA (2012-13)**

	Generation	Transmission	Distribution	Total
GFA	3633.02	3866.05	5193.77	12692.84
%	28.62%	30.46%	40.92%	100.00%

The total non-tariff income reported by the Board for 2012-13 is Rs. 435.82 crore. This is also apportioned based on GFA share above. Hence, the net expenditure after considering and apportioning the non-tariff income is as shown in Table 6.

**Table 6: Functional level of Expense net of non-tariff income**

Cost	Rs. Crore
Generation and power purchase	8,146.02
Transmission	575.33
Distribution*	2,204.89
<b>Total</b>	<b>10926.24</b>

The total expenses at Distribution level is proposed to be apportioned at HT and LT voltages at the ratio of 35:65 for calculation of cost to serve at HT level.

Based on the above, the per unit cost at each interface points is estimated as shown below:

Table 7: per unit cost at different voltage levels

	At State Interface points	EHT level (220kV /110kV / 66kV)	HT level (33kV/11kV)	LT level (below 11kV)
Cost of Generation and Power Purchase	4.10	4.29	4.61	4.97
Cost of Transmission (EHT)		0.34	0.34	0.34
Cost of Distribution (HT)			0.51	0.51
Cost of Distribution (LT)				1.17
Cost at each interface points	4.10	4.63	5.47	6.99

Table 8: per unit cost at different voltage level (Abstract)

	At State Interface points	EHT level (220kV /110kV / 66kV)	HT level (33kV/11kV)	LT level (below 11kV)
Cost at each interface points	4.10	4.63	5.47	6.99

The above table shows the voltage wise cost of supply of KSEB based on the provisional accounts of KSEB for 2012-13 and subject to the assumption made in this computations. The Commission shall after due deliberation and hearing the views of stakeholders , finalise the methodology for calculation of voltage wise cost of supply of Kerala grid. The methodology will be fine tuned as and when more accurate data is made available by KSEB. The Commission shall publish the voltage wise cost of supply every financial year.

The Commission invites comments from all stakeholders on the above methodology on estimation of voltage level cost of supply.

Secretary