CHAPTER – 8
PRINCIPLES OF TARIFF DESIGN

SECTION I : TARIFF DESIGN

1.1 The ARR for all DISCOMs for FY 2008-09, after deduction of other income including trading income, recoverable through retail tariff is estimated at Rs. 1281.57 Cr. The total sale projected for 2008-09 is 2907.55 MU. With the sale and other parameters, the estimated recoverable amount is Rs 1291.62 Cr with a marginal surplus of Rs. 10.05 Cr at an average rate of Rs 4.44/ Kwh **(Annexure-E)**. In view of the above, the retail tariff applicable for 2008-09 shall be same as was for the Tariff Order 2007-08. Due to this reason, detailed category wise analysis is not required to be undertaken. The same shall be taken up during truing up exercise at the end of control period on receipt of actual data.

1.2 For FY 2009-10, the ARR for all DISCOMs after deduction of other income including trading income is approved at Rs 1586.93 Cr which is recoverable through retail tariff with an estimated sale of 3475 MU. With the sale and other parameters, the estimated recoverable amount by application of prevailing tariff of 2007-08 is found to be Rs. 1506.90 Cr at an average rate of Rs 4.34 / Kwh **(Annexure-I)**. This leaves a revenue gap of Rs 80.03 Cr which is to be recovered by revised tariff. The estimated average enhancement is Rs 0.2303 / Kwh say 23 paise/kwh.

Treatment of Revenue Gap for 2009-10

As per the approved ARR for FY 2009-10 for licensees, the revenue gap after considering the revenue from existing tariffs is Rs. 80.03 Cr.

One of the means for bridging the revenue gap is increase in the existing tariff. In order to partly mitigate the revenue gap, the Commission in its best judgement has proposed following mechanism –

(1) Efficiency improvement initiatives resulting distribution loss reduction

(2) Efficiency improvement with minimal investments

(3) Installation of capacitors at 11 KV bus, DTRs and premises of all LT industries

(4) Energy auditing and monitoring

(5) Smaller capacity DTRs to improve HT/LT ratio and bifurcation of overloaded long 11 KV feeders

(6) Identification of "Revenue Leakage" points and strict enforcement of anti-theft measures and special drive initiatives.

In view of the above, Commission feels that there is substantial scope for improvement in the operations of the licensees and suitable steps, if taken by the licensees in this direction can result into substantial financial savings. Considering huge investments under APDRP and other initiatives by the DISCOMs, loss reduction target is achievable.

The Commission, therefore, in its best judgement has approved an increase of energy charge @ 20 paise/Kwh for all category of consumers with effect from 01.08.2009 which is expected to fetch a revenue of Rs 1576.40 Cr for the FY 2009-10 leaving a gap of Rs 10.52 Cr **(Annexure-M)**.

1.3 Structure of Retail Tariff and Transmission & Wheeling Charges

In the economics, the cost chain is compared with "***Ice Ball Rolling over Ice plate***". As all costs in the chain of activities are added to the cost of production which increases the sale price with profit. Uncontrolled cost in the intermediate activities such as transportation, storage and distribution may cause such a scenario like "avalanche" where the sale price is no longer competitive to sustain the product in the market.

On the other hand, unlike other product the electricity business is inherited with an additional factor of transmission and distribution loss which reduces the sale volume from that of production in a substantial order. This phenomenon of the effect of loss may be compared as "***rolling of ice ball on a hot plate***," where every rolling will cause reduction of product with passing phases of sale. The control of loss is a prime factor in the costing of electricity in compare to other product chain. The combined effect of cost and sale may be represented in **Annexure A**

1.4 As discussed in TO 2006-07 & 2007-08 for the purpose of tariff design, the Commission has considered the following documents as basic guidelines.

a. The Tariff Policy notified by the Government of India as per Section 3 of the Electricity Act 2003.

b. The Orders of the Appellate Tribunal of Electricity in disposal of appeal against Tariff Order 2005-06 & 2004-05 (Appeal No 3/2005 & 126/2005) & disposal of Appeal No 13/2008 upholding the order of the Commission dated 17th Oct 2007 in the matter of follow up of Order of Appeal No 3/2005 & 126/2005.

c. Tariff Order 2005-06 and 2006-07 & 2007-08 of the Commission.

1.5 As indicated in Tariff Order 2005-06 and 2006-07, a study on cost of supply was conducted by the Commission. The CoS model was prepared in the form of a "Staff Paper" and was circulated among different stakeholders including the ASEB and successor entities in the Advisory Committee and other meetings of the Commission. The paper was finally accepted by the Commission after incorporating the views and suggestions of all the stakeholders and this model forms a basis for fixing retail tariff for FY 2006-07. An outline of the model was placed in Annexure 17 of TO 2006-07. The approach in this study has been considered as per spirit of the Section 61 (g) of the Electricity Act 2003, which mandates the State Commissions to ensure that the Tariff progressively reflects the cost of supply of electricity and also reduces and eliminates cross subsidies within a period to be specified by the appropriate Commission. The National Tariff Policy notified by Government of India as per provision of Section 3 of the Electricity Act 2003 has mandated the requirement of fixing tariff as per cost of supply to consumers. However, the policy envisages a gradual reduction of cross subsidy with a trajectory so as to bring the tariffs within $\pm$ 20% of the average cost of supply by 2011-12. The Appellate Tribunal of Electricity, in disposing appeal against Tariff Order of the Commission for FY 2005-06, also commented on the need of arriving at the cost of supply as mandated in the Electricity Act. The Hon'ble Appellate Tribunal further upheld the order of the Commission as per direction in Appeal No 5/2005 and Appeal No 126/2005 in the matter of Tariff Order 2004-05 & 2005-06 respectively while disposing Appeal No 13/2008 on 4th May 2009.

1.6 The cost allocation principle incorporated in the CoS model allows both identification and allocation of cross subsidy within the system among consumer categories. The Commission intends to use this model for both tariff fixation and allocation of cross subsidy. The model is based on embedded cost approved by the Commission as per the revenue requirements for the ensuing year that needs to be recovered by way of tariff adjustments. However, while designing the final retail tariff, the Commission is by and large guided by the principle set out in section 61(d) of the Electricity Act 2003, which mandates that the tariffs try to safeguard consumer's interest and at the same time recovery of the reasonable cost of electricity. As a first step, the CoS study tries to identify cost attributable to serve each category of consumers and thereafter assign tariff without considering the element of cross subsidy. But then, as per guidelines of National Tariff Policy, the Commission intends to bring down the percentage band of cross subsidy from the existing level for each category by adjustment of tariff to fill up the revenue gap as far as practicable. The Commission while stressing the need to protect consumer interests, also tried to avoid any tariff shock while calculating and designing the retail tariffs.

1.7 The cross subsidy data for different categories of consumers based on the estimated cost of supply to different categories of consumers is applied to arrive at the cross subsidy surcharge component of tariff of respective categories of consumers. This cost separation as per the model will give an indication of cost causation by different categories of consumers depending on the supply voltage, time of use, load factor etc. The cost separation will facilitate open access to those consumers who may opt for open access benefit as per provision of AERC Open Access Regulation notified on 13th September, 2005. Such consumers shall have to pay open access surcharge to the respective DISCOMs at whose area the consumer is located.

1.8 As discussed in TO 2006-07 and 2007-08 the CoS model and related data required regular updating regarding consumer load curve, consumer load factor, segment wise loss and cost incurred in different activities. The calculations in 2006-07 were based on information on some sample data of load curves of different categories of consumers, sample cost break up for the purpose of separation of distribution cost. Further, loss matrix in the study has been adopted considering a general practice of descending loss with ascending voltage; however in practice this may not be true if there is element of unauthorized tapping at intermediate voltage. In the Tariff Order 2007-08 the COS model was further updated with distribution cost separation as a percentage of asset value at different voltage, however could not be introduced due to data uncertainty.

1.9 In this tariff Order further intensification of Cost of Supply (CoS) model is undertaken so as to effectively segregate distribution wheeling charges in different supply voltages to the consumers along with the consumer charges based on realistic data as per principle of replacement cost. The outline of the principle are placed in the form of a discussion paper **(Annexure-Y)** which was discussed with the representative of petitioners during "Technical and Financial Validation Session" of this Tariff Order.

1.10 Based of updated information, the CoS principle for seasonal consumers, which was uniformly considered for all other consumers are reassessed with the reasoning as explained below.

1.11 Reassessment of Cost of Supply for seasonal consumers:

The CoS model envisaged to derive average demands vis a vis the peak and off peak demands of different categories of consumers from the annual energy consumption. However for seasonal consumers the annual consumption is not a true representation for calculation of average demand. The energy consumption curves of seasonal consumers indicate that approx. 80% energy is consumed during the seasonal period.

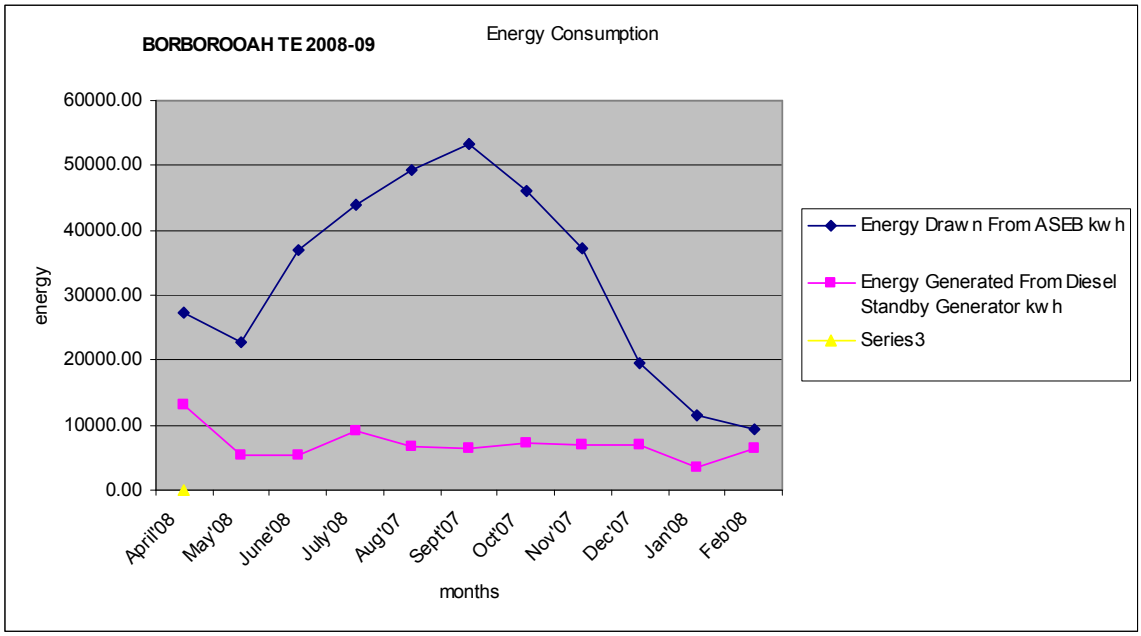

Fig: Typical consumption pattern of Tea Coffee & Rubber category consumer

Due to consideration of total annual energy for the purpose of calculation of average demand and consequent maximum demand derived from the load factor, the demand found to be not as per real maximum demand. As an example the average demand for 2007-08 for Tea category consumer was calculated as 45 MW and maximum demand at 149 MW, which is found to be far less than realistic information. The unrealistic calculated demand has resulted less cost of supply for the seasonal consumers and consequent higher cross subsidy

1.12 For the purpose of a realistic assumption, from the real time data base, the total annual consumptions of seasonal consumers are grouped separately for seasonal and off-seasonal and average demand and maximum demand are separately calculated. The highest of both seasonal demand is considered for the purpose of cost sharing for demand related cost sharing in the CoS model.

1.13 The tea industries are considered as non co incidental peak consumer as per pattern of consumption during seasonal period when actual industrial production process is started. As per the present trend the production process does not create maximum demand during peak hours of the system demand. However during off season period the electricity consumptions in the estate are restricted to lighting and other activities which are utilized mostly during system peak hours with lesser demand. For the purpose maximum demand derived from average demand and load factor is considered as off peak demand during seasonal period (April to November) and maximum demand derived during off-season period is considered as maximum off-peak demand of the category during off-season

period (Dec. to March). Accordingly maximum demand during peak period & off peak period are derived for the CoS model.

1.14 Under Section 62(b) and 62(c) of the Electricity Act 2003, the Commission is also required to fix the transmission and wheeling charges for using the transmission network. These charges fixed on the basis of postage stamp method as per CERC Guidelines, will be applicable for all users of the network including the DISCOMs. The Commission has therefore decided to determine separately the transmission and SLDC charges to be paid by all consumers of the transmission network (66KV and above) including loss. Similarly the consumers using the network below 66 KV are required to pay the wheeling charges at different supply voltage as determined by the Commission in addition to transmission charge.

1.15 Further, based on information of actual peak and off peak demand of the system, specific consumptions by categories of consumer group and sample daily load curve of some category, the "Load Factor" is adjusted marginally to obtain optimum sharing of cost as per utilization by different categories.

1.2 Subsidy by Government of Assam under Section 65

The Fully Allocated Cost Tariff (FACT) for each category of consumers provisionally determined as per provision of the Act as well as the amount of cross subsidy and estimated resultant gap in the revenue requirement was communicated to the Government of Assam (GoA) for direction, if any, in respect of provision of subsidy for any consumer or class of consumers under section 65 of the Act.

1.2.1 Principle for Administration of Subsidy:

In case of availability of subsidy from Government the following principle will be adopted

a) The subsidy given by the GoA (if any) as per Section 65 of Electricity Act 2003 is for maintaining the tariffs at the levels as desired by GoA in respect of the subsidized categories.
b) Each DISCOM gets the subsidy commensurate to the extent of energy sales projected in each subsidized category.
c) The subsidy allocation to each DISCOM as calculated in (b) above should be paid by the GoA to the respective DISCOMs in monthly installments, in advance.
d) The DISCOMs shall file before the Commission the actual sales to subsidized categories of consumers for whom the GoA agreed to pay the subsidy every month and the Commission will monitor the units actually sold by the DISCOMs vis-à-vis the subsidy provided.

e) At the end of the year, subsidy adjustments will be made based on the actual consumption of units in respect of various subsidized categories.

Since the Government of Assam has not intimated anything about subsidy against query of the commission, it appears that no subsidy will be provided this year, and therefore the above mechanism has not been applied in the calculations for determination of retail tariff.

1.3.1 Treatment of Income from trading:

In absence of any direct subsidy from the appropriate government under section 65 of the Act, the objective to avoid tariff shock on the low end consumers such as Jeeban dhara, Domestic-A, small industries etc who are traditionally allowed lower tariff rate, the commission having no other way but to adopt the similar approach as was in TO 2006-07 & 2007-08 in the matter of treatment of trading income in the CoS model. The Commission approved the full cost for the FY 2008-09 & 2009-10 which includes an amount likely to be received on account of trading of surplus energy during high hydro period and during off peak period of day. The fixed cost payment liabilities by ASEB/DISCOMs associated with power purchase from the allocated CSGS/ APGCL/ IPP generators are relatively fixed in nature which is related to peak power requirements of the utilities. Under the ABT regime, the fixed cost liabilities are not varied with less scheduling from generators in case of low intra state demand. Similar is in the case of APGCL and IPP generators which are embedded with ASEB/DISCOMs. The surplus situation during some time in a year and some time of day does not change their liabilities towards fixed cost payment. A marginal reduction of energy charge will only become effective in case of merit order dispatch during surplus scenario. Due to this reason selling of surplus energy during some hours of a day is a compulsion rather than motive for profit. Due to deficit situation in other regions of the country during the monsoon period in NER, ASEB/DISCOMs is able to sell the surplus energy which is shown as income from trading. This income is an **opportunity income** for the utilities. As per practice, the benefit of this should be passed to the ultimate consumers of the state to arrive at the fully allocated costs. Accordingly this amount is assigned to such categories of consumers whose tariff is historically subsidized to maintain the overall cross subsidy within a reasonable band.

1.3.2 The net income accrued by ASEB/DISCOMs on account of sale of surplus power and purchase of power during deficit period is to be adjusted with the ARR of DISCOMs. This income as opportunity income should pass to the consumers in a principle of uniformity. The Commission decided that this income will be first utilized for funding of subsidy at a ratio of existing level of total cross subsidy to the subsidized groups. This will reduce the burden of cross subsidy on the subsidizing groups. **By this arrangement the Commission expects that increase in revenue from net trading sale will**

ultimately contain the tariff of subsidizing groups in future. This arrangement would give a signal to the subsidized categories to rationalize and control their consumption so that ASEB can trade more energy which will be beneficial to them in the long run for future tariff in addition to reduction of energy bill for current use.

1.4.0 Final Retail Tariffs

Section 62(3) of the Electricity Act, 2003, stipulates that the Appropriate Commission while determining the tariff should not show any undue preference to any consumer of electricity, but may differentiate according to the consumers' load factor, power factor, voltage, total consumption of electricity etc. The Commission followed the principle and while finalizing the tariff, considered the existing tariff and cross subsidy and compared these with those of estimated cost of supply for each category and fixed the retail tariff.

1.5.0 Principle of Cross Subsidy: After adjustment of trading income in FACT, the final tariffs are determined by adopting the following principle.

a. The present level of cross subsidy contribution as per estimation is not altered to higher percentage as far as practicable.

b. For consumers receiving cross subsidy, even after adjustment of trading income, tariff will be adjusted nearer to their estimated cost of supply.

c. Categories of consumers availing the benefit of Time of Day (ToD) tariff will continue with rationalization of TOD rates with an aim to contain peak demand.

1.6.0 Segregation of Costs: Activity Based Costing (ABC)

As discussed in TO 2006-07 & 2007-08 with an aim to introducing open access facility to consumers and generators efforts were being made to segregate the cost of supply in a number of functional cost elements of generation fixed charge, fuel charge, transmission charge, distribution fixed charge and consumer charge so that the cost causation only could be charged from the consumer who utilizes the portion of the facility and service. Further, the Commission decided to notify the element of estimated cross subsidy for each category of consumer in a transparent manner.

1.6.1 As per the principle of cost separation the Commission found that the utility should recover a component of fixed expenditure arriving out of the cost separation as consumer charge by curving it out from the fixed charge. This charge shall give a clear meaning of the component and will be give a true picture of the principle of recovery of cost of causation. In the Tariff Order 2007-08, **the Commission expects that in future, the retail tariff shall reflect the cost causation so that cost can be recovered in a more**

transparent manner. In this order endeavour has been made to further stepping towards the goal of reflecting cost in the retail tariff.

1.6.2 The intensification of CoS to facilitate segregation of voltage based cost of asset in a principle of replacement cost, thereby separating the cost at different supply voltage and consumer charges has been undertaken in this order for retail Tariff for 2009-10.

The Commission shall endeavour to follow the guidelines envisaged in the National Tariff Policy while formulating tariff for different users of electricity.

In view of the above, Commission considered all aspects of the Policy in determination of Tariff as far as possible within the inherent limitations and constraints.

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Section 2: Category-wise Analysis of Cost of Service and Tariff for FY 2009-10

[Revenue Gap (Rs 1586.93 – Rs 1506.90) = Rs 80.03 Cr (5.31%)]

{Gap proposed to be recovered (Rs 1576.41-1506.90)= Rs 69.51 Cr (4.61%)}

2.1 LT GROUP

2.1.1 Jeevan Dhara - 0.5 kW & 1 kWh/day: This group of consumers generally uses power during the evening hours when demand for power is the highest. At the estimated total sale of 283 MU, the fully allocated cost of supply considering 60% load factor (LF) to this group is Rs 152.24 Cr. At the present tariff the total cost likely to be recovered is Rs 71.95 Cr, leaving a cost of Rs 80.29 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 95.87 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 77.61 Cr, still leaving a cross subsidy of Rs 18.26 Cr to this group. (Average cost increased from Rs 2.54 to Rs 2.74 an increase of 7.87 %)

The fixed and variable charges are given in tabular form below:

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
76	2.24	4.48	15(30)	2..15	15	2..15	15(30)	2..35	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)

FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.2 Domestic A - above 0.5 kW to 5 kW: This group of consumers generally uses maximum power during the evening when demand for power is the highest. At the estimated total sale of 1190 MU to all the three slabs of consumption, the fully allocated cost of supply considering 60 % load factor (LF) to this group is Rs 640.18 Cr. At the present tariff the total cost likely to be recovered is Rs 435.06 Cr, leaving a cost of Rs 205.12 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 503.23 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 458.86 Cr, still leaving a cross subsidy of Rs 44.37 Cr. (Average cost increased from Rs 3.66 to Rs 3.86, an increase of 5.46 %)

The fixed and variable charges are given in tabular form below:

*CoS (AA)				Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
Domestic A	FC	VC	CC	FC	VC	FC	VC	FC	VC	
0 units - 120 units	99	2.24	9	30	2.80	40	3.60	30	3.00	Nil
120 units - 240 units	149	2.24	9	30	3.85	40	4.85	30	4.05	Nil
Balance	183	2.24	9	30	4.55	40	5.85	30	4.75	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.3 Domestic B - above 5 kW to 20 kW: This group of consumers generally uses maximum power during the evening when demand for power is the highest. At the estimated total sale of 92 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this group is Rs 54.99 Cr. At the present tariff the total cost likely to be recovered is Rs 42.04 Cr, leaving a cost of Rs 12.95 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 46.60 Cr Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 43.88 Cr, still leaving a cross subsidy of Rs 2.72 Cr (Average cost increased from Rs 4.57 to Rs 4.77, an increase of 4.38 %)

The fixed and variable charges are given in tabular form.

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
191	2.24	71	30	4.15	40	5.25	30	4.35	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.4 Commercial – above 0.5 to 20kW: This group of consumers generally uses maximum power during the evening when demand for power is the highest. At the estimated total sale of 270 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this group is Rs 161.39 Cr. At the present tariff the total cost likely to be recovered is Rs 158.79 Cr, leaving a cost of Rs 2.6 Cr left to be recovered.. Revision of tariff to balance the annual revenue requirement

leads to recovery of Rs 164.19 Cr, which is Rs 2.80 Cr more than the CoS, thereby contributing towards cross subsidy. (Average cost increased from Rs 5.88 to Rs 6.08, an increase of 3.40 %)

The fixed and variable charges are given in tabular form below:

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
296	2.24	20	110	4.55	145	5.85	110	4.75	0.10

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.5 General Load upto 20 kW: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 73 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this category of consumers is Rs 32.16 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 37.92 Cr which is above its actual cost of supply by Rs 5.76 Cr. Therefore, this LT group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the annual revenue requirement leads to revenue of Rs 39.38 Cr, and the cross subsidy contribution to Rs 7.22 Cr. (Average cost increased from Rs 5.19 to Rs 5.39, an increase of 3.85 %)

The CoS & approved tariff is as below;

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
188	2.24	93	125	4.00	165	5.20	125	4.20	0.99

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.6 Public Lighting: This group of consumers uses power both during peak & off-peak (night) hours. At the estimated total sale of 8 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this group of consumers is Rs 4.78 Cr. At the present tariff, the total cost likely to be recovered is Rs 4.01 Cr, leaving a cost of Rs 0.77 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 4.32 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs

4.17 Cr, still leaving a cross subsidy of Rs 0.15 Cr. (Average cost increased from Rs 5.01 to Rs 5.21, an increase of 3.99 %)

The CoS & approved Tariff in tabular form follows:

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
474	2.24	151	120	4.25	150	5.30	120	4.45	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.7 Agriculture upto 7.5 hp: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 7 MU, the fully allocated cost of supply considering 30 % load factor (LF) to this group of consumers is Rs 3.17 Cr. At the present tariff, the total cost likely to be recovered is Rs 1.91 Cr, leaving a cost of Rs 1.26 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 2.32 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 2.05 Cr, still leaving a cross subsidy of Rs 0.27 Cr. (Average cost increase from Rs 2.73 to Rs 2.93, an increase of 7.33 %)

The CoS & approved Tariff is given in tabular form;

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
41	2.24	112	30	2.30	40	2.60	30	2.50	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.8 Small Industries - Rural upto 20 kW: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 40.45 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this group of consumers is Rs 17.82 Cr. At the present tariff, the total cost likely to be recovered is Rs 12.26 Cr, leaving a cost of Rs 5.56 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 14.23 Cr. Revision of tariff to balance the annual revenue

requirement leads to recovery of Rs 13.07 Cr, still leaving a cross subsidy of Rs 1.16 Cr. (Average cost increase from Rs 3.03 to Rs 3.23, an increase of 6.60 %)

The CoS & approved Tariff is given below;

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
40	2.24	193	30	2.35	40	3.00	30	2.55	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.1.9 Small Industries - Urban: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 28.45 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this group of consumers is Rs 12.53 Cr. At the present tariff, the total cost likely to be recovered is Rs 9.85 Cr, leaving a cost of Rs 2.68 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 10.94 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 10.42 Cr, still leaving a cross subsidy of Rs 0.52 Cr. (Average cost increased from Rs 3.46 to Rs 3.66, an increase of 5.78 %)

The CoS & approved Tariffs are as follows:

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
57	2.24	238	40	2.60	55	3.35	40	2.80	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/kw/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2 HT GROUPS:

2.2.1 HT Domestic 20 kW and above: This group of consumers generally uses maximum power during the evening when demand for power is the highest. At the estimated total sale of 39 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this group is Rs 22.38 Cr. At the present tariff the total cost likely to be recovered is Rs 16.24 Cr, leaving a cost of

Rs. 6.14 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 18.33 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 17.02 Cr, still leaving a cross subsidy of Rs 1.31 Cr. (Average cost increased from Rs 4.16 to Rs 4.36, an increase of 4.81 %)

The fixed and variable charges are given in tabular form below:

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
379	1.87	641	30	3.95	45	5.10	30	4.15	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.2 HT Commercial 20 kW and above: This group of consumers generally uses maximum power during the evening when demand for power is the highest. At the estimated total sale of 149 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this group is Rs 85.52 Cr. At the present tariff the total cost likely to be recovered is Rs 77.18 Cr, leaving a cost of Rs 8.34 Cr left to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 81.47 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 80.16 Cr, still leaving a cross subsidy of Rs 1.31 Cr. (Average cost increased from Rs 5.18 to Rs 5.38, an increase of 3.86 %)

The CoS and tariff charges are given in tabular form below:

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
429	1.87	758	115	4.25	150	5.60	115	4.45	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.3 Public Water Works: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 48 MU, the fully allocated cost of supply considering 30 % load factor (LF) to this category of consumers is Rs 18.14 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 23.44 Cr which is above its actual cost of supply by Rs 5.30 Cr. Therefore, this HV group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the

annual revenue requirement leads to an increased revenue to Rs 24.40 Cr, and the cross subsidy contribution to Rs 6.26 Cr.(Average cost increased from Rs 4.88 to Rs 5.08, an increase of 4.10%)

The CoS & approved tariffs are as follows

*CoS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
239	1.87	892	125	4.10	165	5.35	125	4.30	1.30

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.4 Bulk Supply 20 kW and above

2.2.4 (1) Government Educational Institutes: This group of consumers generally uses power both during peak and off-peak hours. At the estimated total sale of 41 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this category of consumers is Rs 14.83 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 18.19 Cr which is above its actual cost of supply by Rs 3.36 Cr. Therefore, this HV group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the annual revenue requirement leads to an increased revenue of Rs 19.01 Cr, and the cross subsidy contribution to Rs 4.18 Cr. (Average cost increased from Rs 4.44 to Rs 4.64, an increase of 4.50 %)

The CoS & approved tariff is given below;

*CoS (AA) Rs			Existing Rs		Proposed Rs		Approved Rs		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
259	1.87	4563	110	3.80	140	4.80	110	4.00	1.02

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.4 (2) Others: This group of consumers generally uses power both during peak and off-peak hours. At the estimated total sale of 278 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this category of consumers is Rs 138.75 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 136.32, leaving a gap of Rs 2.43 Cr to be recovered. Revision of tariff to balance the annual revenue requirement leads to an increased

revenue of Rs 141.88 Cr, which resulted cross subsidy contribution to Rs 3.13 Cr. (Average cost increased from Rs 4.90 to Rs 5.10, an increase of 4.08 %)

The CoS & approved tariff is given in table.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
540	1.87	3857	145	4.10	200	5.45	145	4.30	0.11

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.5 HT Small Industries upto 50 kW: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 22 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this group of consumers is Rs 8.09 Cr. At the present tariff, the total cost likely to be recovered is Rs 7.22 Cr, leaving a cost of Rs 0.87 Cr to be recovered. After apportioning a part of trading income as subsidy, the cost of supply to this group of consumers is Rs 7.77 Cr. Revision of tariff to balance the annual revenue requirement leads to recovery of Rs 7.66 Cr, still leaving a cross subsidy of Rs 0.11 Cr. (Average cost increased from Rs 3.28 to Rs 3.48, an increase of 6.10 %)

The CoS & approved tariff follows;

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
112	1.87	792	40	2.80	55	3.60	40	3.00	Nil

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.6 HT Industries I: 50 kW to 150 kW: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 40.45 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this category of consumers is Rs 14.88 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 18.47 Cr which is above its actual cost of supply by Rs 3.59 Cr. Therefore, this HV group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the annual revenue requirement leads to an increased revenue of Rs 19.27 Cr and the

cross subsidy contribution to Rs 4.39 Cr. (Average cost increased from Rs 4.56 to Rs 4.76, an increase of 4.39 %)

The CoS & approved tariff is given in table below.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
148	1.87	1657	100	3.55	135	4.60	100	3.75	1.09

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.7 HT Industries II above 150 kW: This group of consumers generally uses maximum power during peak hours. At the estimated total sale of 455 MU, the fully allocated cost of supply considering 50 % load factor (LF) to this category of consumers is Rs 204.77 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 203.64 Cr, leaving a gap of Rs 1.13 Cr. Revision of tariff to balance the annual revenue requirement leads to an increased revenue of Rs 212.74 Cr, and thereby contributed to the cross subsidy @ Rs 7.97 Cr (Average cost increased from Rs 4.48 to Rs 4.68, an increase of 4.46 %)

The CoS & approved tariff is given in table below.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs/kWh
FC	VC	CC	FC	VC	FC	VC	FC	VC	
458	1.69	9592	140	3.65	190	4.85	140	3.85	0.18

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.8 Tea, Coffee & Rubber: This group of consumers generally uses maximum power during off-peak hours in seasonal period (April to Oct) and during peak hours in off season period.. At the estimated total sale of 308 MU, the fully allocated cost of supply considering 30 % load factor (LF) to this category of consumers is Rs 165.65 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 181.39 Cr which is above its actual cost of supply by Rs 15.74 Cr. Therefore, this HV group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the annual revenue

requirement leads to an increased revenue of Rs 187.55 Cr, and the cross subsidy contribution to Rs 21.90 Cr. (Average cost increased from Rs 5.89 to Rs 6.09, an increase of 4 %)

The CoS & approved tariff is given in the following table.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs
FC	VC	CC	FC	VC	FC	VC	FC	VC	
374	1.87	12239	230	4.00	325	5.50	230	4.20	0.71

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.9 Oil & Coal: This group of consumers generally uses maximum power during peak hours. At the estimated total sale of 63 MU, the fully allocated cost of supply considering 40 % load factor (LF) to this category of consumers is Rs 36.16 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 35.40 Cr, leaving a gap of Rs 0.76 Cr. Revision of tariff to balance the annual revenue requirement leads to an increased revenue of Rs 36.66 Cr, and the cross subsidy contribution to Rs 0.50 Cr. (Average cost increased from Rs 5.62 to Rs 5.82, an increase of 3.56 %)

The CoS & approved tariff is given in table below.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs
FC	VC	CC	FC	VC	FC	VC	FC	VC	
644	1.87	5421	270	4.05	385	5.55	270	4.25	0.08

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs/connection/month

2.2.10 HT Irrigation load above 7.5 hp: This group of consumers generally uses maximum power during off-peak hours. At the estimated total sale of 40 MU, the fully allocated cost of supply considering 30 % load factor (LF) to this category of consumers is Rs 15.12 Cr. At the present tariff, the total revenue likely to be collected from this category is Rs 15.62 Cr which is above its actual cost of supply by Rs 0.50 Cr. Therefore, this HV group is actually contributing this excess amount towards cross subsidizing other consumer categories. Revision of tariff to balance the annual revenue requirement leads to an increased revenue of Rs 16.42 Cr, and the

cross subsidy contribution to Rs 1.30 Cr. (Average cost increased from Rs 3.91 to Rs 4.11, an increase of 5.12 %)

The CoS & approved tariff is given in table below.

*COS (AA)			Existing		Proposed		Approved		Cross Subsidy Surcharge Rs
FC	VC	CC	FC	VC	FC	VC	FC	VC	
91	1.87	862	40	3.25	55	4.10	40	3.45	0.32

*CoS (AA): Cost of Supply (After Adjustment of a part of trading income as subsidy)
FC= Fixed Charge Rs/Kva/month, VC= Variable Charge Rs/kwh/month, CC= Consumer Charge Rs /connection/month

A pictorial depiction showing contribution of cross subsidy surcharge and trading income to the cost of supply of some of the categories of consumers may be seen at **Annexure-AA**.

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Section 3: OPEN ACCESS SCENARIO

[TRANSMISSION CHARGE, SLDC CHARGE, WHEELING CHARGE, CROSS SUBSIDY & ADDITIONAL CROSS SUBSIDY]

The Commission has already notified AERC (Terms & Conditions for Open Access) Regulations 2005, indicating a roadmap for open access facilities to be provided by DISCOMs. In the open access scenario, it is necessary to notify different tariff charges as per provisions of the regulations. Accordingly, as per provision of Clause 15.1 and 15.2, of AERC (Terms & Condition for Open Access) Regulations, the Commission notifies the following charges applicable for open access consumers who are likely to avail the open access facilities including captive generators.

3.1 TRANSMISSION CHARGES

The transmission charges as given in Part VI (AEGCL) are applicable for the use of transmission lines (system) of a transmission licensee by Generating companies, distribution licensees, other Licensees, and also consumers who are permitted open access u/s 42 (2) of the Electricity Act 2003.

Rates:

Transmission charges --------- **Rs. 9434/MW/Day or Rs 0.59/unit**

Plus

Energy losses in kind at 5.5%

3.2 STATE LOAD DESPATCH CENTRE (SLDC) CHARGES

Rate: Rs 71.33 /MW/Day or Paise 0.47/unit

Notes:

i) The Transmission licensee shall deliver the quantum of energy given to it by a generating company or a captive plant or a licensee for transmission as per Cl 5.0 after taking into account the transmission loss of 5.5 %.

ii) The Distribution Companies availing bulk supply from AEGCL (STU) need to pay Transmission charges and SLDC charges separately as the Transmission charges and SLDC charges has not been considered in the Bulk Supply Tariff (BST).

3.3 WHEELING CHARGES

For effective open access in the distribution network the segregation of wheeling cost is very much imperative. For the purpose of segregation of wheeling cost for different segments of network in voltage wise where different consumers are connected for receiving power supply, the commission adopted a replacement cost method of all existing assets of the network. The detailed note is placed in **(Annexure-Y)** for reference. The distribution cost are further separated into

wheeling cost and consumer cost so as to reflect a actual or near actual cost to be recovered from the open access consumers in a transparent manner.

Based on this the wheeling Charge and loss to be compensated at different voltage of Supply are derived as below

Table-I Wheeling Charge at sale end for all DISCOMs

Voltage	Wheeling Costs (Rs Lakh)	Sale MU	Wheeling Charge at sale end
33 KV	837	518	0.16
11 KV	6574	966	0.68
3 Ph LT	6047	519	1.17
1 Ph LT	28546	1473	1.94
Total AV.	42003	3476	1.21

2009-10 ALL DISCOMS

Voltage	%Cumulative Loss	Sale MU	Energy Apportioned at supply source	Wheeling Charge at sending end
132 KV	3.76		0.00	
33 KV	11.31	518	584.06	0.14
11 KV	19.71	966	1203.14	0.55
3 Ph LT	32.84	519	772.78	0.78
1 Ph LT	32.84	1473	2193.27	1.30
Total AV.	25.10	3476	4753	0.88

In addition to the per unit wheeling charge, the **Open Access** consumers are to be liable to pay consumer charge Rs 1000 per month for all HT consumers and Rs 20 per month for all LT consumers. The Commission intended to introduce the "Customer Charge" for all consumers in retail tariff in future so as to reflect cost causation in the tariff.

5.0 Applicability of Transmission, Wheeling & Customer service Charges under different scenario of Open Access:

Table:J

Scenario	Connection of Generator (Source)	Connection of Consumer	Applicability of charges	Reasoning
1	Connected to EHT Network	Distribution Network	Transmission, Wheeling at respective voltage and customer charges	Since power required by open access consumers will flow downstream from transmission network through distribution network upto consumer's connection
2	Connected to distribution network (33 KV and below)	Transmission Network (66 KV & above)	Transmission Charge and customer charge	The consumer requirements will be met by power flow over transmission network alone. The power generated will be locally consumed within the DISCOMs and will not flow upstream to the consumer.
3	Connected to Transmission Network	Connected to Transmission Network	Transmission Charge & Customer Charge	No uses of distribution network.
4	Connected to Distribution System	Connected to Distribution system	Wheeling charge upto the level of voltage where the consumer will be connected & Customer charges.	Power supply by the generator in the locality of DISCOMs will reduce power flow in the transmission network.

NB: 1. Customer Charge will be charged to all consumers as the serving of consumers in terms of metering, billing etc shall remain with DISCOMs.

2. SLDC Charge as applicable for facilitated transaction in Kw/day or kwh basis as the case may be for short term & long term OA.

3.4 Back up power rate:

In an open access operation the transmission and distribution licencees are liable to transmit/ wheel energy from generators/ source to open access consumers. In an ideal situation any deviation in scheduled generation should be adjusted by generator and open access consumer. However, in practice there is likelihood of deviation. The Commission after considering the related issues decided that such unscheduled drawal by open access consumers from DISCOM/Transco network shall be calculated considering highest notified UI rate by CERC regulation at the 220 KV level after apportioning the same with the loss level at which the open access consumer is connected. Any excess energy with the network due to less drawal by consumer than schedule will attract tariff at UI rate as decided by the CERC until AERC notifies interstate ABT rates. However, the generator/ supplier may agree upon some rate in a mutually agreed term and procedure based on prevailing system condition. In absence of any mutually agreed term the temporary supply tariff notified with this order shall be binding as back up supply rate.

3.5 Cross Subsidy Surcharge and Additional Surcharge

The cross subsidy surcharge payable for availing open access to the transmission system and the distribution system as envisaged under sections 38, 39(2)(d), 40(c) and 42(2) of the Electricity Act, including in the case of use of wheeling facility by generators to supply electricity to consumers under existing wheeling agreements, shall be as per the terms and conditions of open access specified u/s 42(2) of the Electricity Act 2003. The cross subsidy charges are calculated considering the Cost of Supply model and The additional surcharge under section 42(4) of the Electricity Act, 2003 shall be payable wherever applicable, in a case to case basis.

Cross Subsidy Surcharge

Category	Amount of Cross Subsidy Rs Cr (net of trading income apportioned)	Cross subsidy Surcharge Rs / kWh
LT Commercial Supply	2.8	0.10
LT General Supply	7.22	0.99
HT PWW	6.26	1.30
HT Bulk supply (Edu)	4.18	1.02
HT Bulk Supply (other)	3.13	0.11
HT Industries-I	4.39	1.09
HT Industries-II	7.97	0.18
HT Tea Coffee Rubber	21.90	0.71
HT Oil & Coal	0.5	0.08
HT Irrigation	1.30	0.32

N.B: No cross subsidy surcharge is applicable for open access from captive generator for captive use.

Section 4 : Discussions on Other Parameters of Tariff

4.1 In Chapter-8, Clause 8.7 of the Tariff Orders 2006-07 & 2007-08, the Commission discussed about other parameter of tariff namely Connected Load, Contracted Demand, Tariff for seasonal Consumers, Availability Based fixed charge, Incentive for higher Power Factor, TOD Tariff, Two Part Tariff Structure, Optional Tariff for HT-11 industrial Category, and incentive to renewable energy.

4.2 Connected Load: In AERC Supply Code Regulation the "***Connected load" is defined as " aggregate of manufacturer's rated capacities of all energy consuming devices, connected with the distribution licensee mains in the consumer installation and which can be simultaneously used; this shall be expressed in KW,KVAor HP units and shall be determined as per procedure laid down by the licensee with the approval of the Commission as specified in this regulation"*** In a two part tariff regime which is now in implementation for recovery of revenue, the fixed component of tariff is mostly guided by the connected load of a consumer. The Connected load of a consumer is the maximum capacity which is contracted by one consumer to draw from the system. As such this known parameter is considered as most appropriate for arrival at the fixed charge rate where facility for actual demand measurement is not available by appropriate metering arrangements. Accordingly for all LT categories the connected load is considered for calculation of fixed charge component of tariff.

4.3 Contract Demand : The 'Contract demand" is defined as ***" the demand contracted in the electricity supply agreement with the licensee. Contract demand shall be determined within the limit specified in the tariff order."*** For HT categories of consumers the fixed charges are levied as "Demand Charge". In a relatively large consumer installation where electricity is utilized for different use of lighting, factory, office etc, where there is likelihood that the consumer installation may not impose demand on the system simultaneously. The ratio between the maximum demand it imposed on the system in (KVA) by a consumer with that of commented load (KVA) is termed as demand factor. This factor is different for different consumers depending on utilization of electricity. Due to this factor most of the utilities allow a flexible range of demand with respect to connected load.

4.4 It may be mentioned here that, in Tariff Order 2004-05, the Commission reviewed the arrangement and change was made in this regard. Prior to this order the minimum contracted demand for recovery of demand charge was 80% of connected load and the consumer can draw upto 100% without any panel charge. In that Order the minimum contracted load was scaled down to 70% of connected load with a range of 70% to 105%. However, a condition was imposed for a mandatory agreement for higher contracted demand annually within the range. In this case if

a consumer exceeded the contracted demand he is liable to pay panel charge at twice the rate of Demand Charge in applicable tariff even his actual demand remains within his connected load. In absence of agreement the contract demand is considered at 100% of connected load. For Tariff Order 2005-06, 2006-07 & 2007-08 the same conditions are prevailing. In the Tariff Order the range was maintained as same except in case of seasonal consumer.

4.5 Tariff for Seasonal Consumers: At present Tea Coffee & Rubber category consumers **are** considered as seasonal consumers. This category consumer also has demand for lowering/ as per their requirements unrelated with the connected load. In TO 2004-05, the minimum demand level was 70% of connected load in KVA during season time and 30% of seasonal demand during off season period. The season time is normally considered for 8 months and off season time for 4 months. As per present arrangements from TO 2006-07 & 2007-08 the consumer should declare his requirement of power demand for season months on or before 31st Aug, within the stipulated range of 65% to 105% of their connected load and off season demand at a minimum of 40 % of seasonal demand. From the records made available it is found that while most of the consumers barring few contracted their seasonal demand within the range of connected load, at the minimum level, the same consumers however opted for higher than minimum stipulated 40% of seasonal demand.. In the Tariff Order 2006-07, it was stated that, the Commission is open to further review of the matter based on data of actual demand created by this category during different season in future.

4.6 In the Tariff Order 2007-08, it was decided that the off season tariff rate should be for any continuous four months from September to March. Further the off season contracted demand was fixed at 40% of contracted demand of season period. As such if any consumer is in requirement of demand in excess of 40% of seasonal contracted demand and draw from the system the consumer is liable to pay penalty in form of higher fixed charge for the excess demand above 40% of seasonal contracted demand. Penalty under compulsive situation is not the intention of the utilities and the commission. As such after reviewing the matter, the commission decided to modify the off season contract period from "any continuous four months from September to March" to maximum continuous four months from September to March". This modification has benefited the utility by recovering higher fixed charge at seasonal rate for more than eight months from some consumers who opted for and the consumer also benefited by avoiding to pay penalty charge for unscheduled demand on the system. The Commission decided to continue the same arrangement during the remaining time of "control period".

4.7 Availability Based Fixed Charge: This concept of availability based fixed charge was first introduced in Tariff Order of the Commission for FY 2004-05. In that order a differential fixed charge was introduced, which increased with higher availability of power to the consumer premises and reduce with lower availability. The approach of the Commission was to penalize the supplier for failure to maintain adequate power and to give incentive for better availability. At the

time when power is in need for a consumer for production activities if supply power fails the consumer generally shifts to standby power. The standby power if considered with fuel of HSD, the cost of production is in the order of Rs 10 to Rs 11 per kwh. After the implementation of the tariff order, the commission staff made a case study and outcome of the study reflected true spirit of the provision where the consumers get benefit even after paying higher fixed charge with higher availability. However this arrangement was not considered favourable by the tea industries and many associated issues have cropped up. In Tariff Order 2005-06, after reviewing the arrangement, the Commission decided to set aside the incentive side to the supplier for higher availability and keep the disincentive side of supplier thereby allowing full benefit to the consumers for failure to supply power at least for 70% time within a month. During the pendency of Tariff Petition 2005-06, the AERC Supply Code and Related matters Regulation was notified where stipulation of minimum hours of power availability for recovery of full fixed charge and pro-rata reduction in case of lower availability were stipulated. In the Order passed by the Appellate Tribunal of Electricity, New Delhi in Appeal No 3 of 2005 on 16.04.2006, the Tribunal opined favourably on the provision. Subsequent Appeal on the follow up of the said order also upheld by the Hon'ble Tribunal in its Order Dated 4th May 2009 in Appeal No 13 of 2008. Considering above, the same provision shall continue for 2008-09 & 2009-10 until further orders.

4.8 Incentive for Higher Power Factor: The present arrangement of rebate for maintaining higher power factor is considered adequate. In the KVA based fixed charge tariff, the consumer is availing twin benefit of lowering demand by improving power factor and benefit of power factor rebate. The present arrangement is almost comparable with other utilities of the country as such no change is necessary.

4.9 TOD Tariff: As discussed in the Section 1- Tariff Design, the Commission intended to extend the benefit of TOD tariff to other HT category of consumers. This Demand Side Management (DSM) practice has been considered as one of the most effective methods for demand management. The configuration of system availability in Assam in terms of generating capacity as well as system constraints necessitated containment of peak demand for entire period of the year. The three tiers TOD tariff introduced in Tariff Order 2005-06 for some categories have already achieved the purpose upto some extent. The categories of consumers where this tariff is applicable often adjusts its power consumption timing from evening peak hours to day or night hours when tariff is relatively low. However, further extension of TOD tariff to other main HT group like commercial & domestic categories will create a different effect on the consumers, due to the reason that these categories are essentially in need of energy during peak hours. As such, imposing a TOD higher rate during peak hours shall force such consumers to save power during peak hours and also reduction of tariff rates for rest of the hours during day and night might generate a plan to rethink their consumption plan by shifting a portion of nonessential load to non-peak hours. The price signal might create a lower demand during peak hours. At present under HT group, domestic, commercial, public water works, HT Small industries and HT

Irrigation are not covered under TOD rate. The utilities had built up some data base and made available to the Commission about consumption during different periods of day by different categories under TOD tariff. The Commission staff made a study on the available data collected from utilities. The findings of the study are as below.

Categories	***Connected Load***	***Total Energy Consumption***	***%age of energy consumed in peak hours***	***Total Peak Energy Consumed***
	KW	***MU***	***%***	***MU***
Tea, Coffee & Rubber	*311307*	*303.17*	*16.86*	*51.11*
HT Industries: I	*38262*	*40.73*	*13.22*	*5.38*
HT Industries: II	*223133*	*330.61*	*12.22*	*40.40*
Oil & Coal	*34021*	*74.3*	*21.62*	*16.06*
Total (MU)				***112.96***
Total Daily Peak Consumption (MU)				***0.31***
Total Daily Peak Consumption (MW)				***61.90***
Daily Peak Consumption (MW) Considering 25% T&D loss				***82.53***

FINDINGS & CONCLUSION:

1. *Three Tier T.O.D. Tariff has been effective with almost all the categories shifting their evening consumption to other periods of the day.*
2. *The 83 MW consumed by these categories during the evening is almost comparable to the 100-150 MW average shortage of peak power during the year.*
3. *The peak consumption may be reduced further by enhancing the T.O.D. rates during evening period in the subsequent tariffs. Otherwise, the DISCOMs may also resort to forced load shedding wherever possible and save themselves from buying power from outside sources at very high rates.*
4. *Also, the DISCOMs and these consumers may enter into an agreement to use their captive plants during the evening hours and an incentive scheme may be designed for the consumers to suit both parties. There is scope for further analysis on the above matter.*

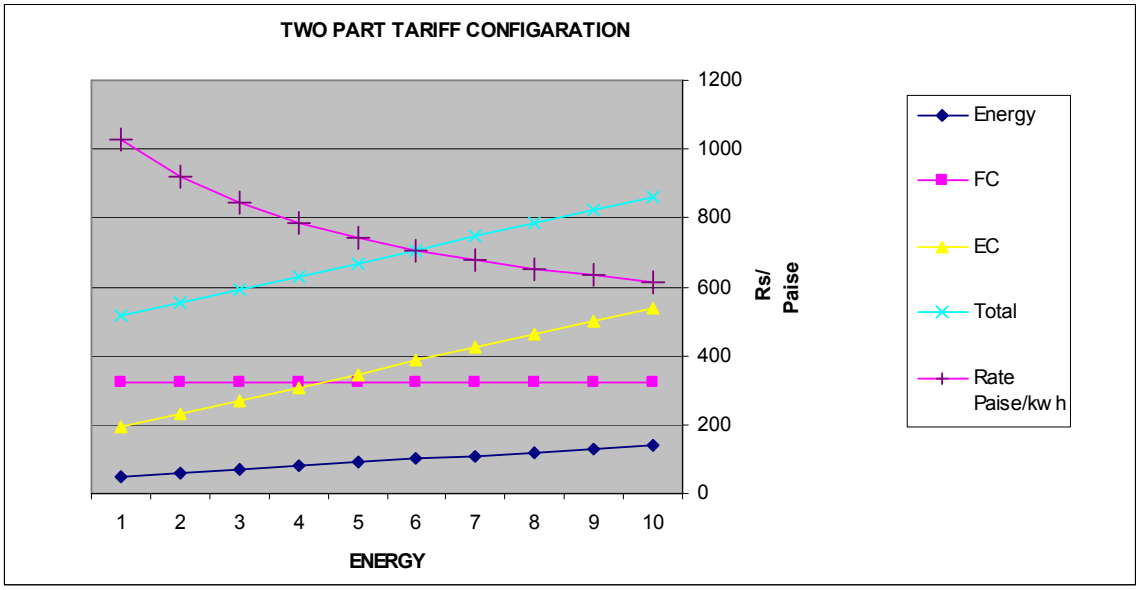
From the report it is found that there are still scopes to reduce peak demand by way of TOD tariff to shift load from peak to off peak hours at least by those consumers without having continuous demand. This aspect has been taken care of while designing ToD tariff rate in this order.

4.10 Two Part Tariff Structure: Like tariffs of other public utility services, Electricity Tariff structure which was in single part mode in earlier days gradually moved towards two part mode. The reason behind adopting two part tariff structure was to recover the cost which the utility bears for providing the facility and also to ensure a certain amount of income to the utilities. The power business is a highly capital intensive one. To provide one KW connection to a consumer, the supplier is required to make an upstream investment of approximately Rs 50000 - Rs 60000. Once the connection is provided to a consumer, the consumption of energy will depend on the requirements of the consumer, and if no consumption is made, the supplier will not be in a position to recover any return on his investment. When tariff was fixed as single part, there was a provision of minimum charge. The factor behind this charge was to recover the portion of charges liable to be borne by the utility even when a consumer is not consuming any power.

4.11 Two part tariff in retail business became more relevant and imperative after 1992 when the Ministry of Power, Government of India notified Tariff Notification making it mandatory for all Central Sector Generating Station (CSGS) to follow two part tariff structure for recovery of revenue from the beneficiaries. The beneficiaries of CSGS are the states belonging to the respective regions where the CSGS is located. Till that time, the fixed charge commitments of state level utilities were limited to recovery of capital investment in the state in the form of depreciation and O&M expenditure including salary of personnel. The concept of minimum charge had taken care of such liabilities in those days. Non implementation of similar principles in the state level power sector as well led to insufficient recovery of revenue.
In order to overcome such deficiencies, two part tariff structure was introduced in state level retail tariff. However, the retail tariff has not been able to reflect actual cost causation of the utilities. The summary of CoS placed in **(Annexure-U)** has stated details of cost with existing and proposed recovery.

4.12 Shortfall of supply during some period of the year is a major factor hampering the adoption of two part tariff in its true spirit and also consumers are not aware about the cost causation. In a supply shortage situation a consumer may feel disgruntled to pay fixed charges. This situation exposes the supplier to a greater business risk in the event of not being able to sell power to consumers. As such, while fixing tariff in two parts, the energy charge component is made unusually higher to match the ARR. Due to this reason some utilities in the country are granted both Fixed Charge and Minimum charge in form of Minimum Guarantee Consumption (MGC) to protect the supplier. The Commission has to consider these aspects while fixing tariff. Further, difference of estimated consumption with that of actual consumption gives a different average tariff rate. This is due to the reason that in two part tariff scenario the average tariff rate changes as shown in the following graphic presentation.

TWO PART TARIFF & AVERAGE TARIFF (The figures are illustrative only)							
		Tariff (Rs)		Revenue (70% of Contracted Demand) (Rs)			
CL KW	Energy (kWh)	FC	EC	FC	EC	Total	Rate (Paise/kWh)
2	50	230	3.85	322.00	192.50	514.50	1029.00
2	60	230	3.85	322.00	231.00	553.00	921.67
2	70	230	3.85	322.00	269.50	591.50	845.00
2	80	230	3.85	322.00	308.00	630.00	787.50
2	90	230	3.85	322.00	346.50	668.50	742.78
2	100	230	3.85	322.00	385.00	707.00	707.00
2	110	230	3.85	322.00	423.50	745.50	677.73
2	120	230	3.85	322.00	462.00	784.00	653.33
2	130	230	3.85	322.00	500.50	822.50	632.69
2	140	230	3.85	322.00	539.00	861.00	615.00



- In two part tariff structure, higher average realization from some consumers often becomes an issue for argument. This situation arises when power is consumed less by some individual consumers due to less demand or due to non-availability of power due to shortage or due to delivery constraints. The matter may need to be examined on a case to case basis as there may be different reasons for low consumption. If supply shortage is considered as a reason, lower consumption by some categories implies that some other categories of consumers are consuming more than estimated consumption. It is observed from records that while some categories exceeded their consumption thereby attaining

less average cost some categories may draw less, thereby attaining a higher average rate during same period. Further, the presence of TOD tariff rates also influences the average tariff rates of some categories. Therefore, the Commission decides that average tariff rate of any category cannot be considered for financial adjustments in future after truing up exercise of past period collections. If higher average tariffs of consumers are adjusted by allowing recovery from supplier in subsequent year, then the lower average tariff categories shall have to pay additionally to compensate the lower recovery to supplier. Such a mechanism defies the very character of the two part tariff model.

4.13 With stepping in towards a regulated environment, it is observed that situation is improving with improvement of standard of performance and shortage of power scenario. These are some of the issues, the Commission must address by determining different charges in retail tariff as per cost causation. Considering this, the Commission has decided not to enhance the fixed charge component of tariff and decided to fill up the revenue gap by partial adjustment of energy charge component. However, the Commission considers it appropriate to notify the estimated cost causation by different category of consumers in terms of fixed charges and energy charges and consumer charge which is explained in details in Section 2: Category wise Analysis of CoS and Tariff.

4.14 Optional Tariff for HT–II Industrial Category: As discussed in TO 2006-07,& 2007-08 this category of consumer mostly comprises of power intensive industries and continuous process industries in addition to single shift/two shift processes. Accordingly, electricity requirement both in terms of energy and power are different, which may require further sub classification of the HT Industrial category into another (third) category of consumers. However, increase of the number of categories at this stage is considered not desirable as the present number of categories is already too many. To address the situation the Commission considered it appropriate to introduce an optional tariff for this category with higher demand charge and lower energy charges in the Tariff Order of 2007-08. It is expected that the optional tariff will be advantageous for power intensive industries to plan their operations in an economical manner.

On demand from utility to abolish the Option-2 from 2008-09, an analysis of consumption pattern of HT-II category consumer has been undertaken to ascertain the effect of Option-1 & Option-2 on consumers as well as on utilities as below

Analysis of HT Industries II Tariff

Option 1			Option 2			
Demand Charge(Rs/KVA/Month	Energy Charge (rs/Kwh)		Demand Charge(Rs/KVA/Month	Energy Charge (Rs/Kwh)		
140	3.65		270	2.95		
Specific consumption of the category kwh/kw/yr as per CAGR	1668			1668		
Monthly bill for 1 Kw Connection (without TOD)	623			632		
Calculation at different Sp. Consumption (kwh/Kw)	Option 1 (amount) (Rs)	Load factor		Option2 (amount) (Rs)	Av Rate Rs/Kwh Option -1	Option -2
1668	**623**	**0.28**		**632**	4.48	4.55
1700	632	0.28		640	4.46	4.52
1750	648	0.29		653	4.44	4.47
1800	663	0.30		665	4.42	4.43
1850	678	0.31		677	4.40	4.39
1900	693	0.31		689	4.38	4.35
1950	708	0.32		702	4.36	4.32
2000	724	0.33		714	4.34	4.28
2200	784	0.36		763	4.28	4.16
2300	815	0.38		788	4.25	4.11
2400	845	0.40		812	4.23	4.06
2500	876	0.41		837	4.20	4.02
2600	906	0.43		862	4.18	3.98
2700	937	0.45		886	4.16	3.94
Overall LF of this category is 28% Industries with higher specific consumption above 30% LF is opting for Option 2 as targeted.						

The HT-II category has shown impressive growth in sale and connected load from 2007-08. From a mere 3% annual growth between 2005-06 & 2006-07 from 260 MU to 269 MU it experienced 50% growth during 2006-07 & 2007-08 to 402 MU. In fact this category is shown highest growth in term of sale and connected load. The built in incentive in the optional tariff may be a reason of higher sale in this category by which consumer has not opted towards alternative energy from standby source or less indulgence to malpractice etc. From the analysis above it seems that higher consumption provides incentive to the consumer to opt for Option-2. As per information to the Commission only consumers with higher LF has opted for Option-2. The Commission further clarify that Option-2 is not restrictive in part of DISCOMs to impose load cut to the consumers in case of system constrains and demand supply mismatch. The stipulation in clause 7.5 of AERC Supply Code Regulation is guided to deal with such situation.

Considering this, it is decided to continue the arrangement of Optional Tariff for HT

Industries-II as this Tariff has yielded desired result to stimulate higher growth in this vital segment of industry.

4.15 Assessments of Energy Consumption in un metered public lighting: Although it is mandatory in part of the distribution licensee to supply any energy only through energy meter as per provision of Section 55 of the Act, very often it is found that public lighting supply remains with without meter/ defective meter due to compulsive reasons. For the purpose of assessment of energy consumption in case of such situation it is decided that assessment will be made considering 12 hours burning time per day.

4.16 Temporary Supply for Agricultural use: Due to extreme climatic conditions very often it is found that permanent agricultural connection is not feasible for the farmers. The water requirements in fields are limited only to three or four months in a year. On the other hand most of the paddy fields are prone to high flood during monsoon months and continuation of an electric supply point become dangerous for the supplier as well as for the consumer due to safety reasons. The temporary supply rate for other consumers are very high considering limited use of such supply. **Considering the situation in an effort to boost agricultural consumption for the benefit of the state, a separate Temporary Connection rate has been introduced in this tariff order.**

4.17 Renewable Energy: The Commission in tariff order 2005-06 notes that "*In Assam, during winter months very high consumption of electricity is observed during the morning hours resulting in peaking of demand in morning in addition to normal peak hours. One of the reason for this peaking of demand in the morning during winter months is use of water heating appliances like geysers, immersion rods etc. These heating appliances consume high amounts of electricity. In order to encourage consumers to switch over to solar water heating system, the Commission proposes to introduce a monthly rebate of Rs.30 for all consumers who have installed such solar water heating systems for meeting their hot water requirements and these are actually used.*"

4.18 The Commission does not have detailed information as to the number of consumers actually using solar water heating appliances and getting benefit from this arrangement. Even then, the Commission has decided it appropriate to continue with the arrangement of granting rebate for use of solar water heating system at Rs 40/- per month with modifications as shown in Chapter - 10 : Schedule of Tariff for details).

4.19 In case of Domestic category of consumers, the higher rating of only one equipment shall be considered for determination of connected load if both Geyser and Air-Conditioner (without heater) are installed and used for domestic purpose only. This provision is subject to disposal of appeal petition filed before Appellate Tribunal for Electricity under Appeal No. 92/2008.

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