Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

In the matter of:

Petition no. 02/2007 dated 31.08.2006 filed by M/s Rai Bahadur Narain Singh Sugar Mills (RBNS) Limited ……..…….Petitioner

And

In the matter of:

Determination of Tariff for Phase 1 (14.6 MW) of Bagasse Based Co-generation Project located at RBNS Sugar Mills Complex, Laksar, District Haridwar for sale of power to UPCL u/s 62(1)(a) and 86 of the Electricity Act, 2003.

Coram

Shri V.J. Talwar Chairman

Shri V.K. Khanna Member

Date of Order: October 22, 2007

ORDER

This Petition has been filed by M/s Rai Bahadur Narain Singh Sugar Mills (RBNS) Limited (hereinafter referred to as "Petitioner") under sections 62 and 86 of the Electricity Act, 2003 (hereinafter referred to as "Act") read with relevant regulations and guidelines of the Commission for determination of tariff for sale of power to Uttarakhand Power Corporation Limited (hereinafter referred to as "UPCL") from Petitioner's Bagasse Based Co-generation Project (hereinafter referred to as "Project") located at RBNS Sugar Mills Complex, Laksar, District Haridwar, Uttarakhand.

(2) The Petitioner filed this Petition on 31.08.2006 (hereinafter referred to as "Original Petition") for determination of final tariff for Phase 1 (14.6 MW) of the Project. The Project is planned to have a total installed capacity of 30 MW after completion of Phase 2. Phase 1 was completed in March 2006 and started

commercial supply to UPCL, the sole distribution and supply licensee in the State, w.e.f. 23.03.2006.

(3) The Original Petition contained certain deficiencies/shortcomings, which were communicated to the Petitioner on 12.10.2006 for their removal.

(4) This being the first case of bagasse based co-generation plant, the Commission prepared and notified the draft regulations for determination of tariff for such plants (hereinafter referred to as "Draft Regulations") on 14.04.2007 inviting comments from stakeholders on the same till 14.05.2007. After considering all the suggestions and objections from various stakeholders, the Commission finalised the UERC (Terms & Conditions for Determination of Tariff for Bagasse Based Co-generation Projects) Regulations, 2007 on 16.07.2007 (hereinafter referred to as "Regulations"), which were notified in the official gazette on 04.08.2007.

(5) In the meantime, pending final determination of tariff, the Petitioner requested the Commission to allow payment at ad-hoc rate as deemed fit by the Commission. The Commission accepted Petitioner's request and on 17.04.2007, allowed recovery at a provisional rate of Rs. 1.69/kWh for electricity supplied to UPCL subject to adjustment upon final determination of tariff.

(6) After removal of deficiencies, the Petition was admitted on 04.06.2007 and a summary of its proposals was published by the Petitioner for response from stakeholders by 22.06.2007.

(7) Only one stakeholder, viz. UPCL, filed objections/comments to the proposals made in this Petition.

(8) UPCL's comments were sent to Petitioner for its response, which was received on 05.07.2007. All the above submissions have been considered by the Commission as brought out in detail later in the order.

1. Petitioner's Submissions

(9) The Petitioner submitted that since the operation period and quantity of power sold to UPCL was meagre in the financial year 2005-06, its data will not

be comparable and, hence, it did not make tariff computations for the year 2005-06. It submitted that it agrees to accept payment for 2005-06 at similar tariff as decided for the year 2006-07.

(10) In the Original Petition filed on 31.08.2006, the Petitioner had submitted data and tariff formats for 9 years starting from 2006-07 till 2014-15. On 03.07.2007, the Petitioner filed a Supplementary Petition revising the formats submitted earlier due to following reasons:

- Bagasse price was revised based on cost of coal as was prescribed in the Draft Regulations
- In original computation, the proportion of energy in steam extracted from back pressure turbine, used for sugar mill process was not subtracted from total energy, which was corrected.
- Actual Prime Lending Rate (PLR) of State Bank of India (SBI) on 01.04.2007 was 12.25%, which was corrected for computation of interest on working capital.

(11) Based on the above, the Petitioner has claimed the following Annual Capacity (Fixed) Charges (AFC) in the Supplementary Petition:

Table 1: AFC Proposed by the Petitioner (Rs. Lakh)

Particulars	2005-06*	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Depreciation	-	75.81	75.81	75.81	75.81	75.81	75.81	75.81	75.81	75.81
Interest on loan	-	172.03	150.26	124.39	96.56	67.75	38.95	13.25	0.49	0.00
Return on Equity	-	112.71	112.71	112.71	112.71	112.71	112.71	112.71	112.71	112.71
Advance Against Depreciation	-	73.53	102.57	102.57	102.57	102.57	102.57	102.57	102.57	102.57
Interest on Working Capital	-	78.32	74.34	75.38	76.46	77.60	78.78	80.01	81.30	82.65
O&M expenses	-	164.25	170.82	177.65	184.76	192.15	199.84	207.83	216.14	224.79
Total	**-**	**676.65**	**686.50**	**668.51**	**648.87**	**628.59**	**608.65**	**592.18**	**589.02**	**598.52**

**Figures not given by Petitioner due to operation for few days only.*

(12) The Petitioner has calculated Energy Sent Out (ESO) from the project in each financial year by using the following:

ESO (LU) = Installed Capacity (MW) x (100 – AUX_n) x Working days per annum x working hours per day x PLF/10^6

Where,

AUX_n = Normative Auxiliary Consumption of 8.5%

PLF = Plant Load Factor

For the year 2005-06 and 2006-07, the Petitioner has taken actual number of days, number of working hours and PLF. For subsequent years, it has taken:

number of days/annum = 150

Working hours/day = 22

PLF = 60% (equal to normative PLF specified in Draft Regulations)

The ESO accordingly proposed for each of the financial years from 2005-06 to 2014-15 is given in Table-2. The Petitioner has also proposed some part of ESO to be used for in-house consumption for the years 2005-06 and 2006-07 and balance energy is shown as export to grid for sale to UPCL. Details are depicted in Table 2 below.

Table 2: ESO Proposed by the Petitioner

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Days/annum	9	150	150	150	150	150	150	150	150	150
Hours/day	22	22	22	22	22	22	22	22	22	22
PLF (%)	48	61	60	60	60	60	60	60	60	60
ESO (LU)	**13.82**	**267.40**	**264.51**	**264.51**	**264.51**	**264.51**	**264.51**	**264.51**	**264.51**	**264.51**
Inhouse(LU)	6.25	148.07	-	-	-	-	-	-	-	-
Export (LU)	7.57	119.33	264.51	264.51	264.51	264.51	264.51	264.51	264.51	264.51

(13) Rate of Fixed Charges (RFC) have been calculated by the Petitioner by dividing the AFC for the year by the ESO (including in-house consumption) taken for the year, which is given below:

Table 3: Proposed RFC (Rs./kWh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
RFC	-	2.53	2.60	2.53	2.45	2.38	2.30	2.24	2.23	2.26

(14) In the Original Petition, the variable charge of energy, i.e. Rate of Energy Charge (REC), was calculated by allocating cost of entire steam produced to power generation (i.e. 5.55 kg of steam/kWh). With steam/bagasse ratio of 2.35, the bagasse requirement was worked out as 2.36 kg/kWh. The price of bagasse was proposed as Rs. 1/kg, based on a recent bill for purchase of bagasse, for 2006-07 with 4% escalation per annum thereafter. The REC was worked out after allowing for 8.5% of auxiliary consumption. The annual

RECs proposed accordingly were as follows:

Table 4: Proposed REC (Rs./kWh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
REC	-	2.58	2.68	2.79	2.90	3.02	3.14	3.26	3.40	3.53

Although Gross Calorific Value (GCV) of bagasse was stated to be 2272 kCal/kg, the same was not used for working out REC.

(15) In the Supplementary Petition, however, the proportion of energy in steam (i.e. 38%) extracted from back pressure turbine, used for sugar mill process was subtracted from total energy of steam and hence the requirement of bagasse used for power generation was reduced to 1.46 kg/kWh. The price of bagasse was also corrected based on cost of coal for equivalent heat value as per the Draft Regulations. REC has been stated to be calculated as per the provisions of Draft Regulations by using information for coal cost as given in Central Electricity Regulatory Commission (CERC)'s order no. 83/2005 dated 21.09.05 in the case of Rihand Super Thermal Power Station. Accordingly, the claim of REC was reduced to Rs. 1.03/kWh for all the years, which has been calculated as follows:

Cost of coal = Rs. 1.08/kg

GCV of Coal = 3800 kCal/kg

GCV of bagasse = 2275 kCal/kg (As per Draft Regulations)

Equivalent bagasse price in proportion of GCV (P_b) = Rs. 0.65/kg

Bagasse required to produce 1 kWh of electicity (Q) = 1.46 kg/kWh

REC = P_b x Q = 0.65 x 1.46 = Rs. 1.03/kWh

(16) The Petitioner has also submitted that the above base price of coal, and hence REC, is subject to adjustment for escalation in coal cost.

2. UPCL's Comments on the Proposals

(17) UPCL's comments were filed on 22.06.2007, when Draft Regulations, floated for public comments, were still not finalised. Further, the Petitioner also revised its proposals for REC in the Supplementary Petition. Accordingly, the

comments of UPCL were based on Draft Regulations and proposals of Petitioner in the Original Petition.

(18) UPCL's comments primarily relate to restricting the Petitioner's claims to the limits prescribed in the Draft Regulations on various components used for determining AFC viz. depreciation including AAD, Capital Cost/MW, RoE (with equity capped to 30%) and O&M expenses.

(19) UPCL has further contended that since only 70% of total energy is earmarked for sale and balance is used for home consumption, these components should be apportioned in the same ratio instead of the entire amount being claimed through sale.

(20) For calculation of energy charge, UPCL stated that cost of coal is not stipulated by CERC in its orders as has been envisaged in Draft Regulations. A mechanism has to brought out in Final Regulations for correctly determining the bagasse price. It has stated that it may not be appropriate to link the price of bagasse, being a by-product of sugar Industry, to the price of coal. The cost of energy of co-generation plant in case of variation of coal price in a deregulated market may likely affect both favourably or adversely. This issue was taken care of by the Commission *suo-moto* by suitably modifying the relevant Draft Regulation and incorporating the same in the finalised Regulations.

(21) UPCL also suggested that bagasse price based on CERC approved tariffs for coal based station as defined in the Draft Regulations, would also need to factor in fuel price adjustment being done subsequently. In support of its suggestion, UPCL has enclosed CERC's relevant regulations dated 26.03.2004, wherein it is stipulated that initially the price and GCV of coal shall be taken on the basis of actuals for preceding three months, whereafter it shall be corrected on actual basis through Fuel Price Adjustment (FPA) Mechanism. This issue has also been addressed in the finalised Regulations. Other comments of UPCL have been taken note of and suitably addressed, wherever necessary, in this Order.

3. Petitioner's Response to UPCL's Comments

(22) In its reply dated 04.07.2007, the Petitioner submitted that with filing of Supplementary Petition dated 03.07.2007, most of the issues related to ceiling norms stipulated in Draft Regulations shall stand resolved. With regard to apportionment of expenses it submitted that in the Supplementary Petition, the AFC has been spread over entire energy generated irrespective of power supplied to UPCL and hence no further bifurcation is required.

(23) The Petitioner has offered no comments on restricting the equity to 30% but has stated that it should be given return @ interest rate applicable to loan funds.

(24) Regarding UPCL's comments on price of bagasse, the Petitioner has stated that:

- A mechanism needs to brought out in Final Regulations for determination of Base Coal Price used for calculating bagasse price
- Petitioner agrees to link bagasse price with price of coal as bagasse price is highly fluctuating in open market and cannot be correctly computed for any particular period. As the fluctuation is both ways, it will not adversely affect interest of single party.
- Although bagasse is a by-product, it has a market value and can be sold in open market. The Petitioner should be compensated for this opportunity cost.

(25) Regarding adjustment for variation in GCV and price of bagasse with time, the Petitioner has stated that GCV of bagasse does not fluctuate substantially and can be taken as standard. For price variation, the adjustment could be based on the price of certain specific variety of coal.

4. Commission's Approach

(26) In terms of section 61 of the Act, the Commission is required to specify the terms and conditions for the determination of tariff through regulations and in doing so to be guided by the factors listed therein. Accordingly, the

Commission notified the Regulations on 04.08.2007, after following due process of law, specifying the terms and conditions for determination of tariff for bagasse based co-generation projects. These Regulations having the force of law are, therefore, binding on all stakeholders including the Commission. The Commission, accordingly, proposes to examine Petitioner's proposals strictly in terms of these Regulations.

(27) The Commission also recognises that development of electricity generation from such sources is in the nascent stage in the State at this juncture. The stakeholders would, therefore, need some time to acquaint themselves and stabilise their operations with the present environment and the regulatory framework with regard to their roles and responsibilities. The Commission would, therefore, examine the claims of the Petitioner with regard to any relaxation in Regulations only under bonafide, genuine and compelling circumstances. Any specific relaxation would, therefore, be purely on the basis of merits and facts of individual case as an exception. It may, however, be pointed out that any particular relaxation in this order shall not become a precedent for other cases, which shall be decided on facts and circumstances of each case.

(28) Under clause (e) of sub-section (1) of section 86 of the Act read with para 6.4(1) of the National Tariff Policy, the Commission is entrusted with the function to promote cogeneration and renewable sources of energy. At the same time, the said para of National Tariff Policy also recognises that it will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Further, the Commission is also empowered to specify a minimum percentage for purchase of electricity from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Presently, there being insignificant generation/purchases from co-generation and renewable sources, the Commission has allowed all the purchases from such sources.

(29) Some of the reasons for promoting generation from such sources have been described in the National Electricity Policy (Para 5.12) as:

- These sources are most environment friendly;
- Need promotion for development of technologies and sustained growth; and
- Co-generation helps in energy efficiency and grid stability.

(30) Apart from the above, other benefits of generation from such sources are:

- Conservation of scarce fossil fuels like coal and oil, which can then be available for longer duration;
- Earnings by CDM benefits being environmentally benign;
- Potential to earn more revenues by sale of ethanol, which is another by-product of sugar industry, to oil companies. As per a recent report in newspapers, a copy of such report is annexed as Annexure-1, the Government is going to make blending a %age of ethanol mandatory with petrol to make it more economical, eco-friendly and also to help farmers of sugarcane.
- Helping in augmenting much needed generation capacity of the country and thereby reducing demand-supply gap of electricity; and
- After some time, when capital costs get services, the generation shall be cheaper as fuel costs are either nil or nominal.

(31) The Act, National Tariff Policy and National Electricity Policy also prescribe some of the ways by which generation from such sources can be promoted. These are:

a) Efforts need to be made to reduce capital cost of such projects;
b) Cost of energy can be reduced by promoting competition within such projects;
c) Commission to provide suitable measures for grid connectivity;
d) Commission to specify a minimum percentage of purchase from such sources by distribution licensee and their share to increase progressively;
e) Future purchases to be made by distribution licensees through competitive bidding;
f) Till such time these sources can compete, in terms of cost, with

conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies;

g) Commission may promote arrangements between the co-generator and the concerned distribution licensee for purchase of surplus power from such plants.

(32) While, issues related to grid connectivity of such captive plants have been addressed in Commission's Retail Tariff Order for 2006-07 dated 12.07.06, the other promotional measures have been taken care of in framing the Regulation as discussed later.

(33) This being the first case of its kind, before examining Petitioner's proposal, the Commission proposes to discuss salient features of the Regulations, alongwith their intent and objective of promotion of such sources, which shall be used for determining Petitioner's plant's generation tariff.

5. Salient Features of Regulations

5.1 Filing of tariff application

(34) The application for determination of tariff for bagasse based projects is to be filed by a generating company in accordance with the Regulations. In case of projects under implementation, the application for provisional tariff may be made on the basis of actual capital expenditure incurred till the date of making application and fresh application is required to be filed for determination of final tariff after commissioning of the project.

(35) The generating company may file application for determination of tariff with duly validated data for as many years for which it wants the tariff to be fixed but not exceeding 5 years.

(36) Tariff for a generating station may be determined stage-wise, unit-wise or for the whole station. Further, in relation to multi-purpose projects, with sugar, paper and power components, the capital cost chargeable to power component only is considered for tariff determination. In case of on-going projects, common facilities are apportioned to stages/units on the basis of

installed capacity of units.

5.2 Norms of Operation

(37) Prescribing normative parameters instead of actuals is beneficial to both the generator and consumers, whereby inbuilt incentive and penalty mechanism for generator is provided depending upon his performance being better or worse than norm. At the same time, it protects the consumers from passing on any unwanted in-efficiency/wastage to them through tariffs. The generator has, thus, a scope of savings by performing better than norm.

5.2.1 Normative Auxiliary Consumption (AUX_n)

(38) Regulation 3(5) defines Auxiliary Consumption as the quantum of energy consumed by auxiliary equipment and transformation losses as a percentage of gross energy generated.

(39) Regulation 12 specifies the normative Auxiliary Consumption (AUX_n) as 8.5% of energy generated.

5.2.2 Normative Gross Station Heat Rate ($GSHR_n$)

(40) Regulation 3(13) defines GSHR as the heat of energy input in kCal required to generate one kWh of electrical energy at generator terminals (i.e. gross generation before auxiliary consumption). The GSHR in fact is a measure of overall efficiency of the generating station before auxiliary consumption. It tells about the input energy (in kCal) requirement from fuel to be burnt for 1 kWh (i.e. about 860 kCal) of gross energy output. Net efficiency of the station can be found from net output (by subtracting auxiliary consumption from gross output) and the input energy.

(41) The normative value of GSHR specified by CERC for coal based plants is about 2500 kCal/kWh (except Tanda, Talcher and lignite fired plants) and normative auxiliary consumption of 8.5% and 9% depending upon type of cooling used. The efficiency of the plant, therefore, required by CERC Regulations would lie in the range of 31.3% to 31.48%.

(42) The normative value of GSHR ($GSHR_n$) for bagasse based projects has been specified as 3300 kCal/kWh in Regulation 11. With an auxiliary consumption of 8.5%, i.e. net output of 787 kWh, and this value of GSHR, the efficiency of power generation comes to 23.85%. This appears to be on a much lower side than that for a coal based plant and contradictory to one of the advantages of co-generation stated above that it is more efficient and hence its GSHR should have been lower than 2500 kCal/kWh.

(43) The Commission has stipulated a higher normative GSHR of 3300 kCal/kWh as a promotional measure by providing a cushion to the generator to the extent of difference between the normative GSHR and his actual GSHR, which as stated above should be less than 2500 kCal/kWh. GSHR being normative, any saving in energy, by increasing efficiency of power generation or mill process or both, is to generator's account without affecting consumer tariffs. Efficiency improvement in the overall system of the generator helps in reducing its own captive requirement and, hence, to that extent energy can be made available to grid for distribution to consumers.

5.2.3 Normative Gross Calorific Value of Bagasse (GCV_n)

(44) Regulation 3(12) defines GCV as the heat produced in kCal by complete combustion of one kg of fuel (bagasse in the present case). Thus, it is a measure of heat content in one kg of bagasse.

(45) Regulation 13 specifies that normative GCV (GCV_n) of bagasse as 2275 kCal/kg. This is in line with Petitioner's submission stated above that GCV for bagasse can be taken on normative basis which more or less remains around this value.

(46) The value of 2275 kCal/kg of GCV is for bagasse on 'as such' i.e. wet basis considering in-house generation of bagasse with moisture content. The Commission has not specified any moisture content in this GCV. In cases, where GCV of bagasse is higher than this value, due to lower moisture content or otherwise, the generator has a saving potential and vice-versa.

(47) With GCV_n=2275 kCal/kg and $GSHR_n$=3300 kCal/kWh, the quantity of

bagasse required to be burnt for producing 3300 kCal of heat and hence a gross generation of 1 kWh would be:

$$Q_n = 3300/2275 = 1.45 \text{ kg/kWh}$$

5.2.4 Normative Annual PLF (PLF_n)

(48) PLF is a measure of actual generation expressed as a %age of maximum possible generation in the period.

(49) Regulation 3(20) provides the formula for PLF for a given period as follows:

$$PLF = \frac{10 \times ESO}{\{IC \times (100 - AUX_n) \times h\}}$$

Where,

IC = Installed Capacity of the generating station in MW,

ESO = Total Energy Sent Out (in kWh) during the period,

AUX_n = Normative Auxiliary Energy Consumption as a percentage of gross generation = 8.5%,

h = Number of hours in the period.

(50) Regulation 10 specifies that target annual PLF (PLF_n) for recovery of full Capacity (Fixed) Charges shall be 45%.

(51) Ensuring recovery at such low PLF of only 45% is one of the promotional measures taken in these Regulations, which protects the generators against lesser generation in a particular year due to any reason. A comparison of this level of normative target PLF with target PLF prescribed by other Commissions for such projects is presented below:

Table 5: Comparison of Target PLFs prescribed by State Commissions

Commission	Uttarakhand	Uttar Pradesh	Karnataka	Tamilnadu	Andhra Pradesh
PLF	45%	60%	60%	55%	55%

(52) If PLF for a given period is known, the ESO (in kWh) during than period can be found by re-arranging the equation for PLF as:

$$ESO = IC \times (100\text{-}AUX_n) \times h \times PLF / 10$$

At normative annual PLF (PLF_n) of 45% and AUX_n =8.5%, the ESO (in

kWh) required to be delivered for entire year can be found by taking d=365 in the above equation as follows:

ESO = 36,06,930 x IC (IC in MW)

5.3 Components of Tariff

(53) The recovery of costs is done by two charges viz. Capacity (Fixed) Charges and Variable (Energy) Charges. Fixed Charges and Energy Charges are recoverable at the Rate of Fixed Charges (RFC) and Rate of Energy Charges (REC) in Rs./kWh for each unit of Energy Sent Out and sold to the licensee.

(54) Regulation 18(1) stipulates that Tariff (in Rs./kWh) for sale of electricity from a bagasse based power generating station shall comprise of two components, namely, Rate of Capacity (Fixed) Charges (RFC) and Rate of Energy (Variable) Charges (REC).

(55) Rate of Fixed Charges (RFC) is based on Annual Capacity (Fixed) Charges (AFC) and annual Energy Sent Out (ESO)/delivered (ex-bus) with Normative Auxiliary Consumption (AUX_n) of 8.5% and ensures that entire AFC is recovered at Normative Annual Plant Load Factor (PLF_n) of only 45%.

(56) The Annual Capacity (Fixed) Charges (AFC) consist of the following components for the entire year:

(a) Interest on loan capital;

(b) Depreciation, including Advance Against Depreciation;

(c) Return on equity;

(d) Operation and maintenance expenses; and

(e) Interest on working capital.

(57) RFC is calculated by dividing the AFC with ESO using the following formula:

RFC (Rs./kWh) = AFC (Rs.)/ESO (kWh)

$$= \frac{10 \times AFC}{IC \times (100 - AUX_n) \times h \times PLF_n}$$

(58) The energy (variable) charges cover fuel cost i.e. cost of bagasse burnt. Being a by-product of sugar industry, it is available virtually free to the generator. Because of its high Volume to Weight ratio and moisture content, it is costlier to store and transport over long distances. However, bagasse is a saleable

commodity being used as raw material in some of the industries like paper, cardboard etc. and, hence, has an opportunity cost. Since bagasse does not have an organised market, its price cannot be correctly ascertained. Therefore, Regulations prescribe the cost of bagasse to be determined on the principle of avoided cost of coal/oil burnt for getting equivalent amount of heat in a thermal generating station. This mechanism for pricing of bagasse provides not only market for sale of bagasse at the point of its generation but also gives a transparent way of determining the value of bagasse.

(59) Accordingly, the cost of bagasse (Rs./kg) is taken as the highest of the costs determined by using following formula for pit head stations of Central Power Sector Undertakings (CPSUs) in the Northern Region on parameters approved by CERC:

Cost of Bagasse (Rs./kg) $$P_b = \frac{(100 - AUX_c)}{100} \times \frac{GCV_n}{GSHR_c} \times REC_c$$

Where,

$GSHR_c$ = GSHR (normative) for coal based plant (kCal/kWh)

REC_c = Rate of Energy Charges after AUX_c (ex-bus) in coal based plant (Rs./kWh)

AUX_c = Auxiliary Consumption (normative) in coal based plant (%)

(60) Rate of Energy Charges (REC) (in Rs./kWh) is the cost of normative quantities of bagasse required for delivering ex-bus one kWh of electricity and is computed as under:

$$REC\,(Rs./kWh) = \frac{100 \times P_b \times Q_n}{\{100 - (AUX_n)\}}$$

Where,

P_b = Cost of baggase in Rs./kg as calculated above

Q_n = 1.45 kg/kWh and AUX_n = 8.5%

5.4 Capital Cost, Financing and Capital Servicing Costs

(61) Regulation 14 stipulates that, subject to prudence check, actual capital expenditure, including the cost of dedicated transmission line and the cost of electrical bay at receiver's end, admitted by the Commission subject to a

maximum ceiling of Rs. 3.50 Crore/MW shall be considered for tariff determination.

(62) Regulation 17 requires the financing mix or debt-equity ratio for the approved capital cost to lie between 100:0 and 70:30. In other words, there is a ceiling of 30% of the capital cost on the amount of equity actually invested for determination of tariff. In cases, where actual equity is more than 30%, the excess equity is treated as normative loan.

(63) Regulation 19 provides that the interest on loan, including normative loan, as on date of commercial operation (CoD) shall be worked out based on loan outstanding at the beginning of the tariff year considering repayments as admitted by the Commission.

5.5 Operating Costs

(64) Regulation 23 stipulates that Operation & Maintenance (O&M) Expenses for first five years are allowed on normative basis i.e. 3.5% of actual capital cost for first year with 4% p.a. escalation thereafter.

(65) O&M expenses after 5 years are to be based on actual expenses for five years with average of these expenses taken as mid year expense, which is to be escalated @ 4% p.a. to arrive at the tariff year expenses.

(66) Interest on Working Capital is allowed as financing cost of loan taken for meeting working capital requirements during operation. It is, however, allowed on normative basis irrespective of the fact whether working capital loan is actually taken or not.

(67) The working capital is ascertained by adding the following components:

- Cost of bagasse for one month
- One month O&M expenses
- Two months receivables
- Maintenance spares @ 1% of capital cost in the first year escalated thereafter @ 6% p.a.

(68) Tax on income, subject to a cap of tax on Return of Equity, from revenue stream from sale of power to licensee is allowed as pass through and

recovered directly from the licensee. Any over/under recovery and refunds/tax exemptions are also passed through to consumers.

6. Commission's Scrutiny & Analysis

(69) As per Regulations, the Petitioner is entitled to file the application for determination of tariff with duly validated projected annual data for as many years for which it wants tariff to be fixed but not exceeding 5 years. The Petitioner has, however, chosen to file the tariff for first 10 years without any reasoning for going in for this variation from the provision of Regulations. The Commission notes that although advance determination of tariff for longer duration gives certainty to the investors, but at the same time also facilitates stability in determination of consumers' tariff. Meriting this consideration, the Commission has accepted Petitioner's proposal by relaxing relevant provision of Regulations in this regard and is, accordingly, determining the tariff for Phase 1 of this Project for first ten years.

(70) The Petitioner, in its application, has not provided any computation for the year 2005-06 as the operation period was only 9 days. The Commission has, however, worked out the tariff for 2005-06 based on permissible expenses for these 9 days.

6.1 Annual Target of Energy Sent Out (ESO) and Rate of Energy Charge (REC)

6.1.1 Annual Target of Energy Sent Out (ESO)

(71) The Annual Target of Energy Sent Out (ESO) during the year has to be calculated as per the formula as set out in para (52) above at target Annual PLF_n of 45%, where hours in a year have to be calculated by multiplying 24 with number of days in the year (i.e. 365 or 366). However, the Petitioner, while calculating ESO, has deviated from this provision and has worked out ESO as 264.51 LUs only by taking number of working days as 150 and number of working hours in day as 22 assuming annual target PLF of 60%. Similarly,

the Petitioner has wrongly calculated PLF for 2006-07 by taking only number of working days and working hours in the year. The PLF calculated by the Petitioner is for the period of working days and not the annual PLF. This methodology is not only contrary to the Regulations, but also defeats the very purpose of specifying target PLF. The Petitioner has not only reduced the target generation by reducing number of days and working hours per day but also by factoring in Target PLF alongwith this reduction.

(72) While the Petitioner projected only 308.59 LUs in the Original Petition, in the Supplementary Petition it projected a further lower generation of only 264.51 LUs with 90% capacity utilisation factor, 22 hours of working/day for 150 days a year alongwith 60% PLF. Whereas in the DPR approved by financial institutions, after stabilisation period, the Petitioner has projected generation with 90% capacity utilisation factor, 24 hours of working/day for 160 days a year. The Petitioner has accordingly projected a generation of 660.1 LUs for 19.1 MW capacity in the DPR, which translates to 504.6 LUs for 14.6 MW installed capacity against 264.51 LUs claimed in the Petition. It may be noted that the financial projections in the DPR are based on this higher generation on the basis of which the Project was financed. Therefore, there is no reason for accepting the proposed lower generation by the Petitioner for working out RFC. In fact, the proposed generation gives an annual PLF of only 22.63%, which of course is unacceptable.

(73) Target PLF of 45% gives the cushion to the generator to have its generation to be lower than maximum possible generation (i.e. 100% PLF) upto a level of target PLF generation. The margin between 100% and Target PLF is the combined margin for loss of generation due to lower than 100% capacity utilisation, shut-downs due to maintenance and breakdowns and generation loss during non-working days due to non-availability of bagasse without specifying limits for each of these components. Thus, target PLF sets a minimum level of overall efficiency of the generator with respect to these parameters with flexibility of maintaining any level of efficiency for each of the above parameters to the generator.

(74) One of the reasons for lower generation during the year 2006-07 has been provided by the Petitioner itself. In its submission dated 14.07.2007, the Petitioner has stated that though its 14.6 MW plant was ready to deliver at normative PLF (60%) from the beginning of sugar season in November 2006, but it could not deliver the whole power to the Grid due to non-completion of 132 kV transmission line in October 2006 as committed by PTCUL/UPCL. The Petitioner states that consequently, about 50% of power could only be transmitted to Grid through a low capacity temporary transmission line of 33 kV, which is full of interruptions like low frequency/low voltage trippings and breakdowns. The Petitioner has enclosed a copy of Minutes of Meeting dated 22.06.2006 in support of its contention (Annexure 2).

(75) The issue of delay in construction of evacuation line and consequences thereof should ideally be adequately covered in the provisions of PPA through indemnity clauses. The compensation, if any, for such loss is to be determined and recovered by enforcing the terms of the said agreement. However, since this issue is not presently under consideration in these proceedings, the Commission has refrained to give any opinion on merits of this issue.

(76) The Annual Energy Sent Out (ESO) calculated as per the Regulations gives a target annual generation of 526.61 LU (528.05 for leap year) as shown below:

$$ESO = IC \times (100\text{-}AUX_n) \times h \times PLF / 10 \text{ Units in kWh}$$

$$= 14.6 \times (100 - 8.5) \times 8760 \times 45/10^6 \text{ LU} = 526.61 \text{ LU}$$

The Commission has accepted 526.61 LUs as ESO for determination of RFC.

6.1.2 Rate of Energy Charges (REC)

(77) The Petitioner, in its revised submissions on REC, has chosen to adopt provisions of Draft Regulations and sought for an REC of Rs. 1.03/kWh based on Normative Fuel Consumption (Q_n) of 1.46 kg/kWh and price of bagasse (P_b) as Rs. 0.65/kg (without any FPA adjustment) on CERC approved rates for Rihand in its Order dated 21.09.2005. This rate has been sought to be adjusted based on variation in actual rates of coal by FPA.

(78) The Commission notes that since the Regulations on the subject stand notified,

they are ought to be followed. In accordance with the Regulations in force (delineated as Regulation 26 and 27), the Rate of Energy Charge (REC) actually works out to Rs. 1.00/kWh, calculation of which is given in the Table 6 below:

Table 6: Calculation of REC based on Rihand parameters

Variable Charges (Rs./kWh)	0.7302
FPA Rate (Rs./kWh)	0.00
RECc (Rs./kWh) (RECc)	**0.7302**
GSHRc (kCal/kWh)	2410.00
AUXc (%)	8.50
GCVn (kCal/kg)	2275.00
Qty. of Bagasse required for 1 kWh of electricity (Qn) (kg/kWh)	1.45
AUXn (%)	8.50
Cost of Bagasse (Rs./kg) {Pb= (100-AUXc) * GCVn * RECc/(100*GSHRc)}	**0.62**
Rate of Energy Charges {(REC (Rs./kWh) = 100*Pb*Qn/(100-AUXn)}	**1.00**

(79) The Commission, therefore, accepts a rate of Rs. 1.00/kWh for 2005-06 and 2006-07 with provision to make suitable adjustments in the same based on actual highest cost and monthly FPAs of Central Generating Stations (CGS) as per Regulations.

(80) For the year 2006-07 and onwards, the Commission has determined the REC as average of REC for the months of January, February and March 2007 (FPA inclusive) based on information available with the Commission for these months, which works out to Rs. 1.32/kWh. The REC for these three months have been calculated in accordance with the provisions of Regulation 26 and 27, as are given in Table 7 below:

Table 7: Calculation of REC for January, February and March 2007

Particulars	**January, 07**			**February, 07**			**March, 07**		
	Singr.	**Rih.-I**	**Rih.-II**	**Singr.**	**Rih.-I**	**Rih.-II**	**Singr.**	**Rih.-I**	**Rih.-II**
Variable Charges (Rs./kWh)	0.74	0.73	0.86	0.74	0.73	0.86	0.74	0.73	0.86
FPA Rate (Rs./kWh)	0.10	0.22	0.11	0.18	0.22	0.11	0.10	0.22	0.11
RECc (Rs./kWh) (RECc)	**0.84**	**0.95**	**0.97**	**0.92**	**0.95**	**0.97**	**0.84**	**0.95**	**0.97**
GSHRc (kCal/kWh)	2475.00	2410.00	2450.00	2475.00	2410.00	2450.00	2475.00	2410.00	2450.00
AUXc (%)	7.75	8.50	7.50	7.75	8.50	7.50	7.75	8.50	7.50
GCVn (kCal/kg)	2275.00	2275.00	2275.00	2275.00	2275.00	2275.00	2275.00	2275.00	2275.00
Qty. of Bagasse required for 1 kWh of electricity (Qn) (kg/kWh)	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
AUXn (%)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
Cost of Bagasse (Rs./kg) {Pb= (100-AUXc) * GCVn * RECc)/(100*GSHRc)}	**0.71**	**0.82**	**0.83**	**0.78**	**0.82**	**0.83**	**0.71**	**0.82**	**0.83**
Highest Cost of Bagasse (Rs./kg)	0.83			0.83			0.83		
Rate of Energy Charges {(REC (Rs./kWh) = 100*Pb*Qn/(100-AUXn)}	**1.32**			**1.32**			**1.32**		

(81) The Petitioner can, therefore, raise bills for REC for the years 2005-06 and 2006-07 at Rs. 1.00/kWh and for 2007-08 onwards at Rs. 1.32/kWh. Adjustment for any month in the above determined REC can be carried out by the Petitioner by calculating the difference between the REC receivable based on actual values of FPA for that month and the REC recovered/charged by it.

(82) Incidentally, it may be mentioned that the approved DPR of the Project did not take into account the cost of bagasse as it is generated in-house free of cost. The Commission has, however, allowed recovery of bagasse cost in accordance with the relevant provisions in the Regulations.

6.2 Annual Fixed Charges (AFC) and Rate of Fixed Charges (RFC)

6.2.1 Capital Cost and Financing thereof

(83) The Project of 30 MW was envisaged to come up in two phases viz. Phase 1 of 14.6 MW and Phase 2 of balance capacity. The Capital Cost and financing as approved by financial institutions is given below:

Table 8: Capital Cost and Financing Approved by FIs (Rs. lakh)

Particulars	Phase-I	Phase-II	Total
Cost of Project			
Land & Site Development	20.00	0.00	20.00
Buildings	81.00	131.00	212.00
Indigenous Plant & Machinery	1,760.00	2,148.00	3,908.00
Misc. Fixed Assets	35.00	45.00	80.00
Preliminary & Preoperative Expenses	198.00	249.00	447.00
Contingencies	105.00	129.00	234.00
Working Capital Margin	9.00	15.00	24.00
Total	**2,208.00**	**2,717.00**	**4,925.00**
Means of Finance			
Promoter's Contribution	218.00	272.00	490.00
GoU Capital Grant	30.00	0.00	30.00
Term Loan from SDF	436.00	543.00	979.00
Loan from Banks/FIs	*1,524.00*	*1,902.00*	*3,426.00*
Loan-Indian Bank	381.00	475.00	856.00
Loan-OBC*	152.00	190.00	342.00
Loan-PNB*	556.00	694.00	1,250.00
Loan-BoB*	435.00	543.00	978.00
Total	**2,208.00**	**2,717.00**	**4,925.00**

** Loans apportioned to Phase 1& 2 in the same proportion as was there for the lead bank, i.e. Indian Bank, in the consortium agreement*

(84) The Petitioner has, however, claimed the Capital Cost of Phase 1 of the project

as Rs. 2588.86 lakh upto 23.03.2006, which has been supported by the certificate of the Chartered Accountant dated 08.08.2006. The claimed capital cost for Phase 1 has been compared with total approved cost of Rs. 4925 lakh for entire project and has been stated to be within the approved limit. As shown in the above Table, the cost of Phase 1 alone taken in approved DPR is Rs. 2208 lakh only against the claimed cost of Rs. 2588.86 lakh. This difference is on account of increase in cost due to cost over-run and amounts to Rs. 380.86 lakhs as shown in the Table below:

Table 9: Cost of Project (Rs. lakh)

Particulars	Approved by FIs	Claimed
Land & Site Development	20.00	0.00
Buildings	81.00	138.28
Indigenous Plant & Machinery	1,760.00	2,279.38
Misc. Fixed Assets	35.00	0.00
Preliminary & Preoperative Expenses	198.00	171.20
Contingencies	105.00	0.00
Working Capital Margin	9.00	0.00
Total	**2,208.00**	**2,588.86**

(85) On seeking Petitioner's comments on reasons for inclusion of this increase in cost, the Petitioner in its reply dated 04.07.2007 informed that the project was originally conceived in the year 2003 and the Banks approved it in August 2004. Further, whereas at the time of preparation of DPR, the boiler cost was assumed as Rs. 8.13 Crore on the basis of information available at that time, the actual cost of the boiler in March 2006 was Rs. 11.50 Crore. The Petitioner has stated that the escalated cost was borne by it from its own resources and since the revised cost is well within the norm of capital cost of Rs. 3.50 Crore/MW, as per Regulations, the same may be permitted.

(86) As per Regualation 14, the Commission has to examine the project cost from the perspective of reasonableness of the capital cost, financing plan, interest during construction, use of efficient technology and such other matters. Any cost variation has, therefore, to be scrutinised with reference to these parameters. As far as reasonableness is concerned, the claimed capital cost of Rs. 25.88 Crore translates to Rs. 1.75 Crore/MW, which is much lower than the

ceiling of Rs. 3.50 Crore/MW. However, it needs to be mentioned here that as per Petitioner's submission the 132 kV evacuation line not constructed by October 2006 as committed by UPCL/PTCUL. As per minutes of meeting dated 22.06.2006 (Annexure 2), the capital cost for which shall be borne by PTCUL and O&M expenses shall be borne by the Petitioner. Since the limit of Rs. 3.50 Crore/MW includes cost of transmission line as well including cost of bay at receiving end, ideally speaking the Petitioner should have borne the cost of evacuation system. However, in this case, since PTCUL is constructing and maintaining the line, the Commission as a special dispensation for this project is permitting associated wheeling charges to PTCUL as expenses to be claimed in its ARR. Accordingly, no transmission related expenses are being considered here. The Petitioner should modify its agreement accordingly. However, till such time this modification takes effect and Petitioner has to pay maintenance charges to PTCUL, the same may be charged separately by the Petitioner in the energy bills raised to UPCL. The parties, however, shall have to maintain a record of such payments for necessary adjustments in their respective ARRs.

(87) The reasons for variation in capital cost need to be examined and categorised as controllable or uncontrollable. Any variation due to factors which are not within the reasonable control of the generator would need to be considered, whereas those which are due to lapses of the generator need to be borne by the generator himself. The Commission believes that having once fixed a ceiling of capital cost, instead of intrusive regulation by component-wise analysis of the capital cost and taking lower of actual or approved cost in each component, light handed regulation is required whereby a flexibility is allowed to the generator to have its cost control measures applied on all components without specifying a limit for each of them as long as total cost is within the approved cost adjusted for uncontrollable factors. This means that total actual cost subject to a ceiling of approved cost, adjusted for uncontrollable factors, or Rs. 3.50 Crore/MW, whichever is lower should be allowed.

(88) The Commission notes that the contract for boiler was awarded at Rs. 870 lakh against the approved cost of Rs. 813 lakh after negotiations with the contractor. Assuming that this was the minimum price at which boiler could have been installed, the excess cost of Rs. 57 lakh can be considered as uncontrollable. As per terms of contract, the cost of Rs. 870 lakh was fixed and could not be changed for whatsoever reasons. Thus, in actual cost of Rs. 1150.48 lakh there was a cost over-run of Rs. 280.48 lakh vis-à-vis the contract price. The reasons for cost over-run are not disclosed in the Petition. Any increase in cost due to lapse on the part of contractor should ideally have been made good by enforcing the terms of contract. Further, there is an expenditure of Rs. 256.91 lakh towards taxes and duties, which was not envisaged in the DPR. Since this is a statutory expenditure, this would fall in the category of uncontrollable expenses. There have been net savings of Rs. 213.53 lakh in the other heads of capital cost, thereby making a total actual capital cost of Rs. 2588.86 lakh, which is shown in the following Table with approved cost and the adjusted approved cost.

Table 10: Variations in Approved Cost (Rs. lakh)

Particulars	Approved Cost	Actual	Variation	Uncontrollable	Approved Cost adjusted for uncontrollable cost
Boiler	813.00	1,150.48	337.48	57.00	870.00
Taxes and Duties	0.00	256.91	256.91	256.91	256.91
Others	1,395.00	1,181.47	-213.53	0.00	1,395.00
Total	**2,208.00**	**2,588.86**	**380.86**	**313.91**	**2,521.91**

(89) Considering the fact that the difference between adjusted cost and actual cost is only Rs. 66.95 lakh and that Phase 2 of the Project is in pipeline, wherein the Petitioner should strive to control the total cost to be within the approved level of Rs. 4925 lakh for the entire Project, the Commission for this phase of the project accepts the capital cost of Rs. 2588.86 lakh claimed by the Petitioner. However, as and when tariff for Phase 2 of Petitioner's Project is determined by the Commission, the cap for approved/adjusted cost shall be considered.

(90) There is also variation in actual financing of the Phase 1 of the Project

claimed in the Petition in comparison to the financing approved by FIs in the DPR. The actual financing of this phase vis-à-vis that approved by the financial institutions funding the project is presented in the following Table:

Table 11: Means of Finance (Rs. lakh)

Particulars	Approved by FIs	Claimed
Equity		
Promoter's Contribution	218.00	805.06
Grant		
GoU Capital Grant	30.00	0.00
Loans		
Term Loan from SDF	436.00	489.50
Loan from Banks/FIs		
Loan-Indian Bank	381.00	381.00
Loan-OBC	152.00	50.42
Loan-PNB	556.00	862.88
Loan-BoB	435.00	0.00
Sub-total Banks	*1,524.00*	*1294.30*
Total Loans	***1960.00***	***1783.80***
Total	**2,208.00**	**2,588.86**

(91) It may be seen from the above Table that for Phase 1 of the Project loan disbursement from Sugar Development Fund (SDF), which is at subsidised rate of 4%, has been higher by Rs. 53.5 lakh. However, out of the requisite loan of Rs. 1524 lakhs from consortium of Banks, the loan that could actually be drawn was Rs. 1294.30 lakh and fell short by Rs. 229.7 lakh. Therefore, net shortfall in loan funds has been stated to be Rs. 176.2 lakh.

(92) The Petitioner has informed vide its submission dated 14.07.2007 that the total term loan Rs. 3426 lakh, for financing the approved cost of Rs. 4925 lakh for the entire Project (Phase 1 and Phase 2), was to be funded by the consortium of 4 banks. However, one Bank, viz. Bank of Baroda (BoB), could not sanction their allocated part of Rs. 978 lakh. Hence, the total sanctioned loan reduced to Rs. 2448 lakh.

(93) Accordingly, out of a loan of Rs. 978 lakh envisaged from BoB, the loan of Rs. 435 lakh required for Phase 1 was not available. Further, there have been variations in actual drawl from SDF, PNB and OBC also as compared to the required levels as per approved DPR. Because of these variations and increased disbursements from some Financial Institutions (FIs), the loan

funds, as stated above, fell short by Rs. 176.20 lakhs and not Rs. 435 lakhs that was not funded by BoB. However, it needs to be pointed out here that the reduction in additional fund requirement due to increased disbursement from banks is only temporary as the increased disbursement from banks is out of total sanctioned loan of Rs. 2448 lakhs and, hence, the excess disbursement for Phase 1 will lead to reduction in disbursement for Phase 2 leading to enhanced fund requirement in Phase 2.

(94) The shortfall in loan funds of Rs. 176.20 lakh has been stated to be funded by the Petitioner from its own resources and the Petitioner has claimed return on the same treating it as its own equity.

(95) Apart from the above, the equity requirement has been stated to increase because capital grant of Rs. 30 lakhs envisaged for this Project cannot be claimed by the Petitioner. The Petitioner has stated that as per Rules, the capital subsidy is given by the State Government for one Project. Since the Petitioner got first sanction against its other project for Sugar Mill, it cannot claim second subsidy and had to employ its own funds.

(96) Third component which lead to increase in equity was the increase in capital cost by Rs. 380.86 lakh over and above that approved in the DPR. The Petitioner has contended that no separate approval was required for meeting the increase in capital cost, which as per terms of loan sanction was to be borne by the Petitioner.

(97) Accordingly, total increase in equity requirement has been claimed to be Rs. 587.06 lakh (176.20 + 30.00 + 380.86) from Rs. 218 lakh making the claimed equity for return as Rs. 805.86 lakh. The Petitioner has also stated that in case the increased equity level, which is 31.1% of capital cost, is restricted to 30% for return purposes as stipulated in the Regulations, the balance equity should earn interest at the rate of loan funds.

(98) As the increase in capital cost has been accepted by the Commission, corresponding increase in equity of Rs. 380.86 lakh, as envisaged in the loan agreement, has been reckoned by the Commission. The Commission also relies on and accepts Petitioner submission without any scrutiny that Rs. 30

lakh of capital subsidy from Government and funding form Bank of Baroda is not actually available to it and, hence, increased equity on these two counts is also considered.

(99) The Commission accepts the funding proposed by the Petitioner, accordingly, actual loan and equity claimed in the Petition has been accepted by the Commission. However, as pointed out by UPCL also, the Regulations stipulate a ceiling 30% on equity employed and equity in excess of 30% is treated as normative equity. Accordingly, the equity for return purposes has been limited to 30% of capital cost i.e. Rs. 776.66 lakh and the balance equity of Rs. 28.40 lakh is treated as normative loan with interest and repayments at the weighted average rate of other loan funds as has been suggested by the Petitioner also.

(100) A summary of the original, claimed and approved financing is presented in the following Table:

Table 12: Original, Claimed and Admitted Financing

Particulars	Approved by FIs	Claimed	Admitted by Commission
Means of Finance			
Equity			
Promoter's Contribution	218.00	805.06	776.66
Grant			
GoU Capital Grant	30.00	0.00	0.00
Loans			
Term Loan from SDF	436.00	489.50	489.50
Loan from Banks/FIs			
Loan-Indian Bank	381.00	381.00	381.00
Loan-OBC	152.00	50.42	50.42
Loan-PNB	556.00	862.88	862.88
Loan-BoB	435.00	0.00	0.00
Sub-total Banks	*1,524.00*	*1294.30*	*1294.30*
Normative Loan	0.00	0.00	28.40
Total Loans	***1960.00***	***1783.80***	***1783.80***
Total	**2,208.00**	**2,588.86**	**2,588.86**

6.2.2 Interest on loans

(101) The Petitioner has claimed interest based on the actual loans received and their repayment schedule, which is depicted in Table 1 above. Since the Commission has considered actual loan as well as normative loan of Rs. 28.40

lakh, it has provided for interest on this loan as well over and above the interest claimed by the Petitioner. The interest and repayments for normative loan have been calculated as weighted average of other loan funds. Detailed calculations of interest for each financial year are annexed as Annexure 3. A summary of claimed and admitted interest is presented below:

Table 13: Interest on Loans (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	-	172.03	150.26	124.39	96.56	67.75	38.95	13.25	0.49	-
Admitted										
Actual loan	4.47	172.03	150.25	124.39	96.56	67.75	38.94	13.25	0.98	-
Normative loan	0.00	2.94	2.84	2.74	2.67	2.60	2.48	2.15	1.10	-
Total	**4.47**	**174.97**	**153.10**	**127.12**	**99.22**	**70.35**	**41.42**	**15.40**	**2.08**	**-**

6.2.3 Depreciation including Advance against Depreciation (AAD)

(102) The Petitioner has claimed a depreciation of Rs. 1.87 lakh for 2005-06 and Rs. 75.81 lakh for 2006-07 onwards. In addition, AAD of Rs. 73.53 lakh for 2006-07 and 102.57 lakh for the years 2007-08 to 2014-15 has also been claimed.

(103) The Petitioner has calculated the depreciation at the rates specified by the Commission in its Regulations on an asset base of Rs. 2160.75 lakh, which yields a weighted average rate of 3.51% (Calculations given by Petitioner are annexed as Annexure 4). This asset base excludes the Interest During Construction (IDC) and other financing costs of Rs. 428.11 lakh, which have been capitalised in the total capital cost of Rs. 2588.89 lakh.

(104) The capitalised financing charges should have been ideally allocated to individual asset categories to make the asset base equal to total capital cost of Rs. 2588.89 lakh. In the absence of such allocation being given by the Petitioner, the Commission is assuming such allocation to be on proportionate basis and, hence, the rate of depreciation for the increased value of asset base of Rs. 2588.89 lakh would remain same. Accordingly, the Commission has allowed depreciation on higher than claimed asset base of Rs. 2588.89 lakh at the rate of 3.51% p.a. as proposed by the Petitioner. This works out to Rs. 2.24 lakh for 2005-06 and Rs. 90.83 lakh for 2007-08 onwards. A summary of

claimed and admitted depreciation is presented in the following Table.

Table 14: Depreciation (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	-	75.81	75.81	75.81	75.81	75.81	75.81	75.81	75.81	75.81
Admitted	2.24	90.83	90.83	90.83	90.83	90.83	90.83	90.83	90.83	38.55

(105) The Advance Against Depreciation (AAD) has been worked out by the Commission as per the provisions of Regulation 21 in order to enable the Petitioner to repay its loans. In order to avoid excessive front loading of tariffs due to AAD, this Regulation puts a ceiling on the amount of AAD admissible as lower of the following:

- Loan repayment subject to a ceiling of 1/10th of Loan minus Depreciation for the year
- Difference between cumulative repayment and cumulative depreciation

(106) The AAD claimed by the Petitioner and admitted by the Commission is presented in the following Table. Detailed calculations for AAD are annexed as Annexure 5.

Table 15: Advance Against Depreciation (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	-	73.53	102.57	102.57	102.57	102.57	102.57	102.57	102.57	102.57
Admitted	0.00	56.36	90.39	90.39	90.39	90.39	90.39	90.39	0.00	0.00

(107) From the above, Depreciation including AAD as claimed by Petitioner and that allowed by the Commission has been calculated and is presented in the following Table:

Table 16: Depreciation including AAD (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	0.00	149.34	178.38	178.38	178.38	178.38	178.38	178.38	178.38	178.38
Admitted	2.24	147.19	181.22	181.22	181.22	181.22	181.22	181.22	90.83	38.55

6.2.4 Return on Equity

(108) The Petitioner has claimed return on equity as Rs. 112.71 lakh @ 14% on the equity base of Rs. 805.06 lakh. As stated earlier, the equity reckoned for tariff purposes is Rs. 776.66 lakh and as per Regulation 22, the return @ 14% on this equity works out to Rs. 108.73 lakh p.a., which has been allowed and depicted in Annexure 7.

6.2.5 Operation & Maintenance (O&M) Expenses

(109) In the Original Petition, the Petitioner sought O&M expenses which were much lower than those claimed in the Supplementary Petition. A comparison of the two is presented in the Table below:

Table 17: O&M Expenses (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Original Petition	-	9.58	9.96	10.36	10.78	11.21	11.66	12.12	12.61	13.11
Supplementary Petition	-	164.25	170.82	177.65	184.76	192.15	199.84	207.83	216.14	224.79

(110) On seeking reasons for the above revision, the Petitioner submitted that the Original Petition was filed much before the notification of Draft Regulations. In the Original Petition, the O&M expenses were mistaken to be Rs. 9.58 lakh for 2006-07. The same has been recomputed @ 3.5% of Rs. 3.50 Crore/MW, which works out to Rs. 11.25 lakh/MW. Accordingly, the O&M expenses have been stated to be revised for installed capacity of 14.6 MW. The same have been escalated further @ 4% p.a. to arrive O&M expenses for subsequent years.

(111) Although the reason advanced by the Petitioner for revising the O&M expenses upwards seems to be logical, the application of relevant Regulation in this regard has been incorrect. Regulation 23(2) clearly stipulates that O&M expenses for the first year shall be allowed at 3.5% of actual cost and not at 3.5% of Rs. 3.50 Crore/MW. It merely stipulates that the ceiling of actual cost for computation of O&M expenses shall be Rs. 3.50 Crore/MW. The

Commission has, accordingly, calculated O&M expenses for 2005-06 as 3.5% of admitted capital cost of Rs. 2588.86 lakh, which have been escalated @ 4% p.a. for subsequent years. Year-wise O&M expenses allowed are given in Annexure 7 and summarised below.

Table 18: Admitted O&M Expenses (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Admitted	2.23	94.23	98.00	101.92	106.00	110.24	114.65	119.24	124.01	128.97

6.2.6 Interest on Working Capital

(112) The Petitioner had also revised interest on working capital in its Supplementary Petition because of revision in other expenses and revision in interest-rate to 12.25% p.a. as per PLR of SBI as shown below:

Table 19: Interest on Working Capital (Original and Revised) (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Original Petition	-	56.61	57.85`	59.14	60.49	61.89	63.35	64.87	66.45	68.10
Supplementary Petition	-	78.32	74.34	75.38	76.46	77.60	78.78	80.01	81.30	82.65

(113) The interest on working capital for the years 2005-06 and onwards has been estimated as per Regulation 24 @12.25% as proposed by the Petitioner. Detailed calculations for Interest on Working Capital are presented in Annexure 6. A summary of claimed and admitted interest is presented below.

Table 20: Interest on Working Capital (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	-	78.32	74.34	75.38	76.46	77.60	78.78	80.01	81.30	82.65
Admitted	0.50	32.32	37.71	37.45	37.23	37.00	36.86	36.68	34.96	34.29

6.2.7 Annual Fixed Charges (AFC)

(114) Based on the above, the AFC for the Petitioner's co-generation plant for Phase 1 of the Project for the years 2005-06 to 2009-10 is presented in Annexure 7 and

is summarised below:

Table 21: Annual Fixed Charges (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Original Petition	-	500.28	509.16	484.98	458.91	431.94	405.04	381.33	268.07	269.73
Supplementary Petition	-	676.65	686.50	668.51	648.87	628.59	608.65	592.18	589.02	598.52
Admitted	12.39	557.44	578.76	556.45	532.41	507.55	482.88	461.26	360.60	310.54

6.3 Rate of Fixed Charges (RFC)

(115) RFC for Phase 1 of the Petitioner's co-generation plant has been worked out by dividing the AFC by ESO for the years 2005-06 to 2009-10 in Annexure 8 and is summarised below:

Table 22: Rate of Fixed Charges (Rs./kWh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Claimed	-	2.53	2.60	2.53	2.45	2.38	2.30	2.24	2.23	2.26
Admitted	0.95	1.06	1.10	1.06	1.01	0.96	0.91	0.88	0.68	0.59

(116) As stipuated in Regulation 25(3), the above RFC is applicable for energy sold upto Target PLF of 45% i.e. 526.61 LU (528.05 LU for 2007-08 and 2011-12).

(117) As the above RFC has been calculated by taking total annual generation at 45% PLF, there is no need for segregating AFC for home consumption and sale to UPCL.

7. Tariff for 2005-06 to 2014-15

(118) Accordingly, the Commission approves tariff for Phase 1 of the Petitioner's co-generation plant for the years 2005-06 to 2014-15 as follows:

Table 23: Approved Tariff (Rs./kWh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
#RFC	0.95	1.06	1.10	1.06	1.01	0.96	0.91	0.88	0.68	0.59
*REC	1.00	1.00	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32

#Upto sale of 526.61 LU

**subject to adjustment as described in the following para.*

(119) While no RFC is payable beyond target generation of 526.61 LU (528.05 LU for 2007-08 and 2011-12), an incentive @ determined by CERC, which presently is 25 p/kWh, for thermal generating stations is payable for each unit of sale beyond this level.

(120) The rate of energy charge for the years 2005-06 and 2006-07 is without FPA adjustment. However, for the year 2007-08 and onwards it is based on average of bagasse price (with FPA included) with actual parameters for pit-head CGS for the last three months of financial year 2006-07. These shall be subject to adjustment for each month based on actual FPA for that month in the pit-head Central Generating Stations (CGS) of Northern Region calculated by the methodology described earlier. No separate Petition shall be required to be filed for this purpose and the generator may raise bills for such adjustments clearly giving the basis and calculations of adjustments in the bills and, if necessary, consult UPCL for this purpose. However, in case of any dispute the matter may be referred to the Commission.

(121) As per the Regulations, the generator has the option to get the tariff determined either stage-wise or for the whole generating station. In the event of the generator choosing to get tariff determined for the entire station after completion of Phase 2 of the Project, the above tariff shall get replaced with the common tariff, as would then be determined by the Commission.

(122) The Petition is, accordingly, disposed off.

(V.K. Khanna) **(V.J. Talwar)**

Member **Chairman**

Annexure 1: Newspaper Report on Blending of Ethanol with Petrol

All petrol to be 10% green from Oct '08

GoM Proposes Mandatory Blending With Ethanol

Mahendra Kumar Singh | TNN

New Delhi: India is set to embrace green fuel in a big way. Come October 2008, oil companies will have to mandatorily blend petrol with 10% ethanol.

While 5% ethanol blending has been prescribed by government since November 2006, high duty levels and shortage of molasses have held back large-scale implementation. But a group of ministers, headed by external affairs minister Pranab Mukherjee, has recommended that oil companies should immediately move to 5% blending in all states except Jammu & Kashmir, the North-East and island territories.

The next stage is a voluntary shift to 10% blending from October this year. But this might not be feasible due to lack of infrastructure. Besides, a Cabinet nod to GoM's recommendations is also needed.

For diesel, the government is pushing bio-diesel from plants like jatropha.

India may be taking small steps towards green fuel but countries like Brazil have vehicles designed to run on 100% ethanol, though 24% blend is more of a norm.

The US too is a big votary of ethanol, though most of it comes from corn, with lower dependence on sugarcane. Ethanol, which can also be produced from soyabean, is said to be less toxic than bio-diesel.

While the move would do a world of good to the air that Indians inhale, sugar companies, which are facing price pressure due to a bumper cane harvest, could breathe easy. In any case, officials said, the move was pushed by the department of food and public distribution as part of a package of measures for the sugar industry. The measures include a loan waiver and excise-duty concessions.

FAST TRACK

- Government had mooted 5% ethanol blending since November 2006, but large-scale implementation was held back due to high duty levels and shortage of molasses
- Now, it proposes immediate implemention in all states except J&K and those in N-E
- Recommends voluntary shift to 10% blending from Oct '07

For oil companies, however, there would be no savings. To facilitate a shift to ethanol blending, the ministerial panel also recommended a uniform purchase price of Rs 21.50 per litre for supply of ethanol by the sugar industry for the next three years.

Petroleum ministry sources were, however, sceptical about the price since they feared that the sugar companies would jack up molasses prices once the crop was on the downward curve. Though the present level of blending does not require modifications in vehicles, a shift to the next level would require changes in specifications. "We will need an approval from the Bureau of Indian Standards to usher in 10% blending. But we will start the process once approvals and supplies are in place," an official said.

Besides, sources pointed out, they had managed to procure only 9 crore litres of ethanol since November last year, and could end the 12-month period till October this year with around 14 crore litres, against the demand for over 50 crore litres just to meet the 5% blending norm. Sources said one option was to link procurement to production levels, but no decision had been taken.

Annexure 2: Copy of Minutes of Meeting dated 22.06.2006

Minutes of Meeting for Evacuation of Power from M/s. RBNS Sugar Mills, Laksar against PPA dated 16-09-2005 held on 22-06-2006.

Following were present:

UPCL	PTCUL	R.B.N.S. Mill
Sri S.P.S. Raghav, CMD Sri T. Panda D(F) Sri A.K. Agarwal CGM (Com)	Sri S. Mohan Ram, MD	Sri S.M. Mittal, G.M. Sri P.P. Singh, D.G.M. Sri Anuraj Goel, Sr. Manager Elect.

The matter of evacuation of power was discussed and following was decided:

1. The 132 KV line & bay, etc shall be constructed by PTCUL at its own cost and shall also be maintained by them. However, the annual maintenance charges shall be paid by M/s. RBNS Sugar Mills to PTCUL as per the terms and conditions of PPA.

2. For construction of the above lines & bay, PTCUL may charge the wheeling charges in its ARR which will be paid by UPCL.

3. The power from the plant shall be taken by UPCL at the generation bus bar of M/s. RBNS Sugar Mill.

4. The line & bay work shall be completed by PTCUL by 15-10-2006.

The provision of PPA shall suitably be amended as per above decision.

(S.M. Mittal)
General Manager
RBNS

(S. Mohan Ram)
Managing Director
PTCUL

22/06/06

(S.P.S. Raghav)
Chairman and Managing Director
UPCL

Annexure 3: Interest on Loans (Rs. lakh)

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Loan- Sugar Development Fund (SDF)									
Opening Balance	489.50	489.50	489.50	489.50	440.55	342.65	244.75	146.85	48.95
Repayments during the year	0.00	0.00	0.00	48.95	97.90	97.90	97.90	97.90	48.95
Closing Balance	489.50	489.50	489.50	440.55	342.65	244.75	146.85	48.95	0.00
Average Loan	489.50	489.50	489.50	465.03	391.60	293.70	195.80	97.90	24.48
Rate of Interest	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Interest	0.48	19.58	19.58	18.60	15.66	11.75	7.83	3.92	0.98
Loan- Oriental Bank of Commerce(OBC)									
Opening Balance	50.42	50.42	44.60	36.85	29.09	21.33	13.57	5.82	0.00
Repayments during the year	0.00	5.82	7.76	7.76	7.76	7.76	7.76	5.82	0.00
Closing Balance	50.42	44.60	36.85	29.09	21.33	13.57	5.82	0.00	0.00
Average Loan	50.42	47.51	40.72	32.97	25.21	17.45	9.70	2.91	0.00
Rate of Interest	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%
Interest	0.16	5.94	5.09	4.12	3.15	2.18	1.21	0.36	0.00
Loan - Punjab National Bank (PNB)									
Opening Balance	862.88	862.88	763.32	630.57	497.82	365.06	232.31	99.56	0.00
Repayments during the year	0.00	99.56	132.75	132.75	132.75	132.75	132.75	99.56	0.00
Closing Balance	862.88	763.32	630.57	497.82	365.06	232.31	99.56	0.00	0.00
Average Loan	862.88	813.10	696.94	564.19	431.44	298.69	165.94	49.78	0.00
Rate of Interest	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%
Interest	2.66	101.64	87.12	70.52	53.93	37.34	20.74	6.22	0.00
Loan - Indian Bank (IB)									
Opening Balance	381.00	381.00	337.04	278.42	219.81	161.19	102.58	43.96	0.00
Repayments during the year	0.00	43.96	58.62	58.62	58.62	58.62	58.62	43.96	0.00
Closing Balance	381.00	337.04	278.42	219.81	161.19	102.58	43.96	0.00	0.00
Average Loan	381.00	359.02	307.73	249.12	190.50	131.88	73.27	21.98	0.00
Rate of Interest	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%
Interest	1.17	44.88	38.47	31.14	23.81	16.49	9.16	2.75	0.00
Normative Loan									
Opening Balance	28.40	28.40	28.32	28.21	28.07	27.90	27.73	27.57	27.43
Repayments during the year	0.00	0.08	0.11	0.14	0.17	0.17	0.17	0.14	0.03
Closing Balance	28.40	28.32	28.21	28.07	27.90	27.73	27.57	27.43	27.40
Average Loan	28.40	28.36	28.26	28.14	27.98	27.82	27.65	27.50	27.42
Rate of Interest	0.26%	10.35%	10.06%	9.73%	9.53%	9.35%	8.95%	7.81%	4.00%
Interest	0.00	2.94	2.84	2.74	2.67	2.60	2.48	2.15	1.10
Total Loan									
Opening Balance	1,812.20	1,812.20	1,662.78	1,463.54	1,215.33	918.14	620.95	323.76	76.38
Repayments during the year	0.00	149.43	199.23	248.21	297.19	297.19	297.19	247.38	48.98
Closing Balance	1,812.20	1,662.78	1,463.54	1,215.33	918.14	620.95	323.76	76.38	27.40
Average Loan	1,812.20	1,737.49	1,563.16	1,339.44	1,066.73	769.54	472.36	200.07	51.89
Rate of Interest									
Interest	**4.47**	**174.97**	**153.10**	**127.12**	**99.22**	**70.35**	**41.42**	**15.40**	**2.08**
Interest on Actual Loans	4.47	172.03	150.25	124.39	96.56	67.75	38.94	13.25	0.98

Annexure 4: Depreciation Claimed by Petitioner (Rs. lakh)

Sl. no.	Name of the Assets[1]	Gross Block as on 23.03.2006 or as on COD, whichever is later	Depreciation Rates as per CERC's Depreciation Rate Schedule	Depreciation Amount FY 2005-06	Depreciation Amount FY 2006-07 & onward
	1	2	3	4= Col.2 X Col.3	
1	**Land**	0.00	0.00%	0.00	0.00
2	**Building**	94.70	3.60%	0.08	3.41
3	**Other Civil Work**	43.58	1.80%	0.02	0.78
4	**Plant & Equipment**			0.00	
4a	**Steam Generator Island**	1150.48	3.60%	1.02	41.42
4b	**Turbine Generator Island**	363.87	3.60%	0.32	13.10
4c	**BOP Mechanical**			0.00	
I	External water supply system	0.00	3.60%	0.00	0.00
ii	CW system	76.99	3.60%	0.07	2.77
iii	DM water Plant	39.01	3.60%	0.03	1.40
iv	Clarification plant	0.00	3.60%	0.00	0.00
v	Chlorination Plant	0.00	3.60%	0.00	0.00
vi	Fuel Handiling & Storage system	76.28	3.60%	0.07	2.75
vii	Ash Handling System	0.00	3.60%	0.00	0.00
viii	Coal Handling Plant	0.00		0.00	0.00
ix	Rolling Stock and Locomotives	0.00		0.00	0.00
x	MGR	0.00		0.00	0.00
xi	Air Compressor System	0.00		0.00	0.00
xii	Air Condition & Ventilation System	0.00		0.00	0.00
xiii	Fire fighting System	0.00		0.00	0.00
xiv	HP/LP Piping & Valvue	112.05	2.57%	0.07	2.88
	Total BOP Mechanical	**304.33**		**0.24**	**9.80**
4d	**BOP Electrical**				
I	Switch Yard Package	142.81	3.60%	0.13	5.14
ii	Transformers Package	57.12	3.60%	0.05	2.06
iii	Switch gear Package	0.00	3.60%	0.00	0.00
iv	Cables , Cable facilities & grounding	3.86	2.57%	0.00	0.10
v	Lighting	0.00	6.00%	0.00	0.00
vi	Emergency D.G. set	0.00	6.00%	0.00	0.00
	Total BOP Electrical	**203.79**		**0.18**	**7.30**
	GRAND TOTAL	**2160.75**		**1.87**	**75.81**
	Weighted Average Dep.Rate(%)			**0.00%**	**3.51%**

Annexure 5: Advance Against Depreciation (Rs. lakh)

S. No.	Particulars	2005-06	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
1	1/10th of the Loan(s)	4.47	181.22	181.22	181.22	181.22	181.22	181.22	181.22	181.22	181.22
2	Repayment of the Loan(s) as considered for working out Interest on Loan	0.00	149.43	199.23	248.21	297.19	297.19	297.19	247.38	48.98	0.00
3	Minimum of the Above	0.00	149.43	181.22	181.22	181.22	181.22	181.22	181.22	48.98	0.00
4	Depreciation during the year	2.24	90.83	90.83	90.83	90.83	90.83	90.83	90.83	90.83	38.55
5	Current Year Difference (3-4) (only if +ve)	0.00	58.60	90.39	90.39	90.39	90.39	90.39	90.39	0.00	0.00
7	Cumulative repayment	0.00	149.43	348.66	596.87	894.06	1,191.25	1,488.44	1,735.82	1,784.80	1,784.80
6	Cumulative depreciation including AAD	2.24	93.07	240.25	421.47	602.70	783.92	965.14	1,146.36	1,327.58	1,366.13
8	Cumulative Difference (6-7) (only if +ve)	0.00	56.36	108.41	175.40	291.37	407.34	523.31	589.47	457.22	418.67
9	Permissible AAD (Minimum of 5 & 8)	0.00	56.36	90.39	90.39	90.39	90.39	90.39	90.39	0.00	0.00

Annexure 6: Interest on Working Capital (Rs. lakh)

Sl. No.	Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-2011	2011-2012	2012-13	2013-2014	2014-2015
1	O & M expenses	0.19	7.85	8.17	8.49	8.83	9.19	9.55	9.94	10.33	10.75
2	Maintenance Spares	0.64	27.44	29.09	30.83	32.68	34.64	36.72	38.93	41.26	43.74
3	Recievables	2.12	183.31	212.55	208.51	204.50	200.36	196.57	192.65	175.87	167.53
4	Cost of bagasse	1.11	45.20	58.04	57.89	57.89	57.89	58.04	57.89	57.89	57.89
5	Total Working Capital	**4.06**	**263.80**	**307.85**	**305.72**	**303.91**	**302.08**	**300.89**	**299.40**	**285.35**	**279.90**
6	Rate of Interest*	12.25%	12.25%	12.25%	12.25%	12.25%	12.25%	12.25%	12.25%	12.25%	12.25%
7	Interest on Working Capital	0.50	32.32	37.71	37.45	37.23	37.00	36.86	36.68	34.96	34.29

Annexure 7: Annual Fixed Charges (Rs. lakh)

Sl. No.	Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-2011	2011-2012	2012-13	2013-2014	2014-2015
1	Depreciation	2.24	90.83	90.83	90.83	90.83	90.83	90.83	90.83	90.83	38.55
2	Interest on Loan	4.47	174.97	153.10	127.12	99.22	70.35	41.42	15.40	2.08	0.00
3	Return on Equity	2.68	108.73	108.73	108.73	108.73	108.73	108.73	108.73	108.73	108.73
4	AAD	0.00	56.36	90.39	90.39	90.39	90.39	90.39	90.39	0.00	0.00
5	Interest on WC	0.50	32.32	37.71	37.45	37.23	37.00	36.86	36.68	34.96	34.29
6	O & M Expenses	2.23	94.23	98.00	101.92	106.00	110.24	114.65	119.24	124.01	128.97
7	**Total**	**12.39**	**557.44**	**578.76**	**556.45**	**532.41**	**507.55**	**482.88**	**461.26**	**360.60**	**310.54**

Annexure 8: Rate of Fix Charges (Rs./kWh)

Sl. No.	Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-2011	2011-2012	2012-13	2013-2014	2014-2015
1	AFC	12.39	557.44	578.76	556.45	532.41	507.55	482.88	461.26	360.60	310.54
2	No. of days/year	9.00	365.00	366.00	365.00	365.00	365.00	366.00	365.00	365.00	365.00
3	ESO (LU)	12.98	526.61	528.05	526.61	526.61	526.61	528.05	526.61	526.61	526.61
4	**RFC (Rs./kWh)**	**0.95**	**1.06**	**1.10**	**1.06**	**1.01**	**0.96**	**0.91**	**0.88**	**0.68**	**0.59**