TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Comprehensive Tariff Order for Bagasse based Co-generation plants

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Order No. 7 of 2012 dated 31 - 07 - 2012

TAMIL NADU ELECTRICITY REGULATORY COMMISSION

(Constituted under section 82 (1) of Electricity Act 2003)

(Central Act 36 of 2003)

PRESENT : Thiru. K.Venugopal – Member

Thiru. S.Nagalsamy – Member

Order No. 7 of 2012, dated 31 -07-2012

In the matter of: Power procurement by Distribution Licensee from Bagasse based Co-generation plants and allied issues relating to captive use and third party sale

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In exercise of power conferred by Section 181 read with Section 61 (h) and 86 (1) (e) of the Electricity Act 2003, (Central Act 36 of 2003), and after taking into account the stipulations in the National Electricity Policy and the Tariff Policy and in accordance with the Power Procurement from New and Renewable Energy Sources Regulations, 2008 of the Commission and after examining the comments received from the stakeholders, after considering the views of the State Advisory Committee meeting held on 29-03-2012 in accordance with section 88 of Electricity Act 2003, after examining the comments received from the stakeholders during the stakeholder's hearing held on 08-06-2012 as per Section 64 of Electricity Act 2003, the Tamil Nadu Electricity Regulatory Commission, hereby, passes this order to determine the tariff and other conditions for power procurement by Distribution Licensee from Bagasse based Co-generation plants and allied issues relating to captive use and third party sale.

This Order shall take effect on and from 01st August of 2012.

Sd/-	Sd/-
(S. Nagalsamy) Member	(K.Venugopal) Member

/By order of the Commission/

-sd-
S. Gunasekaran
Secretary

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<u>ORDER ON POWER PROCUREMENT BY DISTRIBUTION LICENSEE FROM BAGASSE BASED CO-GENERATION POWER PLANTS AND ALLIED ISSUES RELATING TO CAPTIVE USE AND THIRD PARTY SALE</u>

1.0 <u>Introduction</u>

The State of Tamil Nadu has good potential for harnessing Non conventional Sources of Energy. Bagasse based Co-generation is one such source and therefore, the Commission has analyzed various issues of determination of tariff for bagasse based cogeneration before finalizing this third Order.

1.1 Commission's Regulation on New and Renewable Energy Source

1.1.1. The Commission notified the "Power Procurement from New and Renewable Sources of Energy Regulations 2008" on 08-02-2008 in accordance with the powers vested under Section 61 of the Electricity Act 2003 (Central Act 36 of 2003) which stipulates that the State Electricity Regulatory Commissions shall specify the terms and conditions for the determination of tariff.

1.1.2. Amongst other important provisions listed in the Regulations, it is also specified that the tariff determined by the Commission shall be applicable for a period of twenty years and the control period may ordinarily be two years.

1.2 Commission's order on NCES based generation and allied Issues

1.2.1. The Commission issued Order No 3 of 2006 on "Power purchase and allied issues in respect of Non-Conventional Energy Sources based Generating Plants and Non-Conventional Energy Sources based Co-Generation Plants" on 15-05-2006. The said Order stipulated tariff rates for power procurement by Distribution Licensees from Wind Energy Generators, Biomass based generators and Bagasse based co-generators. This was the first Order issued by the Commission on NCES based power plants .

1.2.2. The Commission issued Order No. 3 of 2009 dated 06-05-2009 on "**Comprehensive Tariff Order for Bagasse based Co-generation Plants".** This

Order covered tariff rates for power procurement by the distribution licensee from Bagasse based co-generators. In the said Order , the Commission fixed the validity of the Order upto 31-03-2011. By Tariff Order No.3 of 2011 dated 12-04-2011 , the said Order was extended upto 31-12-2011 and it was further extended upto 30-06-2012 by Tariff Order No.6 of 2011 dated 21-12-2011 . This Order was again extended upto 31-07-2012 in Tariff Order No 4 of 2012 dated 30-06-2012.

1.3 Commission's initiative on tariff revision for Bagasse based co-generation

1.3.1. As a part of the procedure to issue a revised Order for Bagasse based Co-generation, the Commission issued a Public Notice on 03-05-2011 inviting views / suggestions from the stakeholders by 31-05-2011. The public notice is placed in **Annexure I**.

1.3.2. Some of the stakeholders like Ministry of New and Renewable Energy Sources (MNRE), Indian Renewable Energy Development Agency (IREDA), Tamil Nadu Energy Development Agency (TEDA) etc did not respond to the public notice within the due date. Hence, the last date for submission of comments by the stakeholders was further extended upto 15-07-2011. The list of the stakeholders who submitted written comments is placed in **Annexure II.**

1.3.3. A meeting of the State Advisory Committee (SAC) was also held on 29-03-2012 to elicit their views . The list of SAC members who participated in the meeting is placed in **Annexure III.**

1.3.4. A stakeholder's hearing was held on 08-06-2012 at the Institution of Engineers (India) building at Chennai. The list of stakeholders who presented their views in the hearing is placed in **Annexure IV** and the list of participants of the same hearing is placed in **Annexure V .**

1.3.5. Taking into account the views of various stakeholders and the views of the SAC members, the Commission issues this comprehensive Tariff Order on Bagasse based co-generation plants.

<u>2.0 Bagasse based Co-generation Power Scenario in Tamil Nadu</u>

The installed capacity of the bagasse based co-generation plants in Tamil Nadu is 637.40 MW as on 31-03-2012. The year wise capacity addition in Tamil Nadu over the past 10 years is furnished below:

Year	**Capacity Addition in MW**
Upto 1999-2000	141.60
2000-01	-
2001-02	-
2002-03	100.50
2003-04	32.00
2004-05	-
2005-06	35.00
2006-07	22.00
2007-08	115.00
2008-09	20.00
2009-10	93.80
2010-11	52.50
2011-12	25.00
Total (upto 31-03-2012)	**637.40**

<u>Note</u> : It is understood that out of the above 637.40 MW with PPA to supply power to TANGEDCO, 95 MW was allowed to exit the PPA and 542.40 MW are still supplying power to TANGEDCO as on 31-03-2012.

<u>3.0 Legal Provisions</u>

3.1 Related Provisions of the Electricity Act, 2003 :

3.1.1. The Commission is guided by the following provisions of Section 61 of the Electricity Act 2003 which are relevant to this Order :

Section 61 *– " The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-*

(a) the principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies and transmission licensees;

(b) the generation, transmission, distribution and supply of electricity are conducted on commercial principles;

(c) the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments;

(d) safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner;

(e) the principles rewarding efficiency in performance;

(f) multi year tariff principles;

(g) that the tariff progressively reflects the cost of supply of electricity and also, reduces cross-subsidies in the manner specified by the Appropriate Commission;

*(h) the promotion of co-generation and generation of electricity from renewable sources of energy**;***

(i) the National Electricity Policy and tariff policy:"

3.1.2. **Section 86** stipulates the following among other functions of the State Commission.

Section 86(1)(e) : "Promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;"

3.2 Related Provisions of the National Electricity Policy:

The guidelines stipulated in the National Electricity Policy on NCES, which are relevant , are reproduced below:

" (1). Clause 5.2.20: *Feasible potential of non-conventional energy resources, mainly small hydro, wind and bio-mass would also need to be exploited fully to create additional power* *generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.*

(2). Clause 5.12.1: *Non-conventional sources of energy being the most environment friendly, there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.*

(3) Clause 5.12.2: *The Electricity Act 2003 provides that co-generation and generation of electricity from non-conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively the share of electricity from non-conventional sources would need to be increased as prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies. "*

3.3 Related Provisions in the Tariff Policy

The Commission is also guided by the following specific provisions of the Tariff Policy of Government of India (Ministry of Power) relating to NCES:

" (1) Clause 5(3) (i): *Tariff fixation for all electricity projects (generation, transmission and distribution) that result in lower Green House Gas (GHG) emissions than the relevant base line should take into account the benefits obtained from the Clean Development Mechanism*

(CDM) into consideration, in a manner so as to provide adequate incentive to the project developers.

(2) Clause 6.0: *Accelerated growth of the generation capacity sector is essential to meet the estimated growth in demand. Adequacy of generation is also essential for efficient functioning of power markets. At the same time, it is to be ensured that new capacity addition should deliver electricity at most efficient rates to protect the interests of consumers. This policy stipulates the following for meeting these objectives.*

(3) Clause 6.4(1): *Pursuant to provisions of section 86(1)(e) of the Act, the appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.*

It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs determined by the appropriate Commission.

(4) Clause 6.4(2): *Such procurement by distribution licensees for future requirements shall be done, as far as possible, through competitive bidding process under Section 63 of the Act within suppliers offering energy from same type of non-conventional sources. In the long-term, these technologies would need to compete with other sources in terms of full costs."*

4.0 Promotion of New and Renewable source of Energy

In order to promote new & renewable sources of energy, the Commission has prescribed the minimum percentage of electrical energy which each obligated entity shall purchase from new and renewable sources generators. The obligated entity shall comply with the provisions as stipulated in the Commission's Renewable Purchase Obligations Regulations, 2010, as amended from time to time. "Obligated entity" is a subject matter of a Writ Petition in Hon'ble High Court of Madras.

5.0 Applicability of this Order

5.1. The Tariff Order No 3 of 2009 dated 06-05-2009 for Bagassee based co-generation plants was valid till 31-03-2011 and its validity was extended upto 31-12-2011 vide Tariff Order No 3 of 2011 dated 12-04-2011. This Order was further extended upto 30-06-2012 by Order No 6 of 2011 dated 21-12-2011. This Order was again extended upto 31-07-2012 in Tariff Order No 4 of 2012 dated 30-06-2012.

5.2 Many stake holders have requested for retrospective application of the tariff order since the Commission has extended the validity of the previous tariff order beyond 31-3-2011. This issue was examined by the Commission. This Order contains many provisions not only relating to tariff but also relating to other terms and conditions. Since changes are made in various provisions of the previous tariff order , the Commission considers it appropriate to give effect to all the provisions contained in this tariff order only prospectively .

5.3 This order shall come into effect from 01-08-2012. The agreement between the generators and the distribution licensee in relation to all plants commissioned on or after 01-08-2012 shall be in conformity with this order. The existing Energy Purchase Agreements (EPAs) between the generators and the distribution licensee in relation to tariff shall continue to be valid.

6.0 Tariff Determination Process

The Commission has issued the Regulations on Power Procurement from New and Renewable Sources of Energy Regulation, 2008. Important provisions of the Regulation 4 which emphasize on promotion of NCES is reproduced below for reference :

“ (1) The Commission shall follow the process mentioned below for the determination of tariff for the power from new and renewable sources based generators, namely:-

a) initiating the process of fixing the tariff either suo motu or on an application filed by the distribution licensee or by the generator.

b) inviting public response on the suo motu proceedings or on the application filed by the *distribution licensee or by the generator.*

c) *Omitted*

d) *issuing general / specific tariff order for purchase of power from new and renewable sources based generators. "*

7.0 Tariff / Pricing Methodology

Regulation 4 of the Power Procurement from New and Renewable Sources of Energy Regulation, 2008 also details the basic guidelines on the Tariff / Pricing Methodology. Important provisions in the Regulations are reproduced below:

" (2) While deciding the tariff for power purchase by distribution licensee from new and renewable sources based generators, the Commission shall, as far as possible, be guided by the principles and methodologies specified by:

(a) *Central Commission*
(b) *National Electricity Policy*
(c) *Tariff Policy*
(d) *Rural Electrification Policy*
(e) *Forum of Regulators (FOR)*
(f) *Central and State Governments*

(3) The Commission shall, by a general or specific order, determine the tariff for the purchase of power from each kind of new and renewable sources based generators by the distribution licensee.

Provided where the tariff has been determined by following transparent process of bidding in accordance with the guidelines issued by the Central Government, as provided under section 63 of the Act, the Commission shall adopt such tariff.

(4) While determining the tariff, the Commission may, to the extent possible consider to permit an allowance / disincentive based on technology, fuel, market risk, environmental benefits and social impact etc., of each type of new and renewable source.

(5) While determining the tariff, the Commission shall adopt appropriate financial and operational parameters.

(6) While determining the tariff, the Commission may adopt appropriate tariff methodology. "

7.1 Market Determined Pricing

In a free market, where there is adequate competition among various players, the price is determined by the market mechanism. This price could be obtained for a long , medium or short term . Wherever market is not developed, performance based bench mark system of pricing as notified by the Commission by way of tariff regulations are applicable. The issue of competitively procuring power from renewable energy sources in the absence of Guidelines of Government of India for competitive bidding for procurement of NCES power is a subject matter of an appeal before the Hon'ble Supreme Court. In view of this, the Commission continues with the Cost Plus Tariff determination in this Order

7.2 Cost-Plus Tariff Determination

Cost-Plus Tariff determination is not the best method and it discourages competition and efficiency. However, to encourage the setting up of new co-gen plants and till competitive bidding is introduced, Cost Plus Tariff method is followed. As it can be easily designed to provide adequate return to the investors, the Commission adopts the Cost plus Tariff approach in this Order.

7.3 Single Part vs. Two Part Tariff

In the Commission's Order No. 3 of 2009 dated 06-05-2009, the Commission adopted the **"Cost plus two part tariff".** Generally, the two part tariff is adopted when the fuel cost varies from time to time and the fuel cost is considered as pass through. The variable component of tariff would take care of such price escalation. The stake holders expressed the view that the two part tariff is convenient to accommodate the fuel cost escalations appropriately. Therefore, a two part tariff is adopted in this Order.

8.0 Issues Relating to Tariff and allied matters :

8.1 Tariff Components

The Power Procurement from New and Renewable Sources of Energy Regulation, 2008 specifies that while determining the tariff, the Commission shall adopt appropriate financial and operational parameters for the tariff determined in a cost-plus scenario. The Commission has carried out a detailed analysis of the existing policies/procedures and commercial mechanisms in respect of Bagasse based co-generation.

The following important tariff components have been considered to arrive at the tariff and other related issues for bagasse based co-generation.

1. Capital cost
2. Plant Load Factor
3. Debt – Equity ratio
4. Term of loan
5. Interest rate for loan
6. Return on Equity
7. Life of plant and machinery
8. Depreciation
9. O & M Expenses
10. Station Heat rate
11. Gross calorific value of the fuel
12. Specific fuel consumption
13. Fuel cost
14. Components of working capital
15. Interest on working capital
16. Auxiliary consumption

The issue-wise suggestions of the stakeholders and the decision of the Commission are discussed below:

8.1.1. Capital cost :

8.1.1.1. The Commission assumed Rs.4.67 Crores / MW as the capital cost for Order No.3 of 2009 dated 06-05-2009.

8.1.1.2. E.I.D.- Parry (India) Ltd, stated that the capital cost of bagasse based cogeneration has increased due to increase in steel cost, boiler cost etc. Therefore the Commission can consider the capital cost at Rs.6 Crores per MW. The South India Sugar Mills Association (SISMA) opined that the capital cost be fixed at Rs 5.65 Crores / MW as air cooled condensers are being used and the mills are also bearing the evacuation charges. M/s Empee Sugars & Chemicals Ltd wanted the Commission to fix the capital cost at Rs 4.96 Crores / MW. M/s IREDA, New Delhi suggested that the Commission fix the capital cost at Rs 4 Crores– Rs 5.5 Crores / MW with increase by 4-5% if the project used air cooled condensers . Terra Energy Limited suggested that the capital cost be increased to Rs.5.75 to 6 Crores per MW as the cost of evacuation is also being borne by the generators.

8.1.1.3. The licensee, M/s TANGEDCO suggested the capital cost to be fixed at Rs 3.9 Crores / MW as followed in Andhra Pradesh ERC.

8.1.1.4. In the previous Tariff Order No 3 of 2009 dated 6-5-2009, TANGEDCO had expressed that unless the cost is segregated between the sugar industry and cogeneration, the correct cost cannot be represented. The Commission sought clarification as to how the cost allocation is done for power generation and other uses since steam is used in power generation as well as sugar production. A generalized statement was made during the hearing on 08-06-2012 by the representative of SISMA that steam generated in the boiler is used for power generation and a portion of the steam which is extracted from steam turbine is used for sugar manufacture. No further details were made available. When the steam is extracted from the turbine for use in sugar mill, it is also not clear whether the steam after use in the sugar mill is condensed and brought back to the steam cycle or it is wasted. The energy content of the steam extracted as well as the make up water requirement are not made available. If these details were available, the Commission could have worked out the allocation of cost for use of steam in power generation vis-à-vis sugar manufacture. In the absence of such a detailed analysis , the Commission would like to use thumb rule method for giving benefit to the power segment for the steam used for sugar manufacture which is not a regulated business . In case these details are made available by the bagasee based co-generation plants, a detailed analysis can be carried out in future, atleast for the next tariff order. In the absence of any explanation by the generators and in the absence of any details in this regard, the Commission decides to deduct 10% of the capacity charges towards steam extracted and used in sugar manufacture.

8.1.1.5. CERC in its Renewable Energy Sources Regulations, 2012 has fixed the normative capital cost at Rs 4.20 Crores /MW which is inclusive of evacuation cost .

8.1.1.6. Therefore, considering the views of various stakeholders, the Commission decides to adopt the CERC rate of Rs 4.20 Crores / MW inclusive of evacuation cost in this Tariff Order. The Commission also apportions the capital cost on machineries, land and civil works at 85% and 15% respectively.

8.1.2. Plant Load Factor (PLF) :

8.1.2.1. The plant load factor of a bagasse based co-generation plant depends on a number of factors like mechanical efficiency of the plant, vintage of the plant etc .

8.1.2.2. M/s Rajshree Sugars & Chemicals Ltd, Chennai requested the Commission to waive the PLF based tariff for plants established after 19-09-2008 and fix the uniform tariff throughout cane crushing season , irrespective of the months. M/s E.I.D.- Parry (India) Ltd wanted the Commission to calculate PLF based on Sugar year (October to September). They further stated that the PLF of average of five years can be considered as availability of sugarcane for the sugar mills is seasonal. It was also clarified that fossil fuel was being used in the plants only when the cane is partially available so as to run the plant. As such, the assets are idle for 4-5 months in a year.

8.1.2.3. M/s Empee Sugars & Chemicals Ltd stated that the PLF could be fixed at 82%, considering cane crushing duration of 300 days. SISMA wanted TANGEDCO to pay the preferential tariff upto the determined PLF to the extent of power exported to the Grid as per the Power Purchase Agreement (PPA) and not consider PLF of 55%. They also said that PLF may be fixed at an average of 5 years instead of 55% p.a as availability of sugarcane is seasonal in nature causing annual fluctuations in the plant utilization . IREDA suggested that the PLF could be fixed at 60%. Terra Energy Ltd suggested PLF to be based on a five year average instead of 55% as bagasse based generation varies from year to year. Beyond 55% PLF, ABT is less than cost of generation. Therefore generation beyond 55% may be paid at ABT or Variable Cost whichever is higher.

8.1.2.4. The licensee, M/s TANGEDCO suggested that a PLF of 55% may be considered as per Commission's Order No 3 of 2009 .

8.1.2.5. Some of the sugar mills also use fossil fuel during off seasons. Even during the crushing season if the sugarcane is not available supplementary fuel is used. The Commission would like to continue with the PLF of 55% on an annual basis. The PLF is an annual phenomenon for the purpose of cost recovery . The suggestion of various stake holders for adopting a PLF over a 5 year period could not therefore be accepted.

8.1.2.6. It is quite likely that in some cases , generation may go beyond 55% PLF. Once the annual fixed charges or the capital cost recovery is achieved at the normative PLF of 55%, any generation beyond the normative PLF of 55% does not warrant payment of fixed charges. An incentive would be adequate for such extra generation for the extra efforts and wear and tear of the plant and equipment. Commission therefore introduces the concept of incentive which is already in practice in other conventional power stations. 10% of the fixed charge applicable for that year is allowed as incentive for extra generation beyond normative PLF. The variable cost as provided in this Order would be applicable if bagasee is used as fuel. If any other fuel is used , the total tariff shall be in accordance with Order No. 4 of 2006 dated 15-05-2006 , as amended from time to time. This tariff as per Order No. 4 of 2006 is the total tariff and the generator is not entitled for incentive and variable cost as in the case of generation with Bagasse as fuel.

8.1.3. Debt - Equity Ratio:

A Debt-equity ratio of 70 : 30 is prescribed by the Tariff Policy for power projects. The stakeholders such as Empee Sugars & Chemicals Ltd , IREDA and the licensee - TANGEDCO have all stated that the debt equity ratio be fixed at 70 : 30. Therefore, the Commission adopts the ratio of 70:30 in this Order.

8.1.4. Term of loan

8.1.4.1. M/s Empee Sugars & Chemicals Ltd and the licensee – TANGEDCO have suggested the term of the loan as 10 years with 1 year moratorium. SISMA have however suggested the term of loan as 10 years with 2 years moratorium. M/s E.I.D.- Parry (India) Ltd opined that the term of loan can be for 10 years with 3 years moratorium. M/s IREDA suggested that 10 years with 1 year moratorium after commissioning may be considered as the tenure of the loan.

8.1.4.2. As tenure of loans may vary from project to project and developer to developer, the Commission decides to adopt 10 years with a moratorium of one year as suggested by IREDA for this Order as IREDA is the major financial institution for NCES projects .

8.1.5. Interest rate for loan

8.1.5.1. Both Empee Sugars & Chemicals Ltd and SISMA wanted the interest to be fixed at 14.5%.M/s E.I.D.- Parry (India) Ltd has stated that Banks are not prepared to fund the sugar mills as the mills are not receiving payment for nearly seven to eight months from TANGEDCO. However, the farmers who supply the sugarcane need to be compulsorily paid within 14 days. Interest rate of 14.5% is too high and instead suggested that the Commission can consider the interest rate at 13.5%.

8.1.5.2. IREDA suggested that the rate be linked to the State Bank of India Base rate with an addition of 3 to 5% . However, in their website, IREDA has tabulated the interest rates applicable from 16-08-2011 to various sectors. As per the said tabulation , the interest rate applicable to Co-generation plants is in the range of 11.75% - 12.5% .

8.1.5.3. The licensee - TANGEDCO has suggested that the interest rates be softened to 10% p.a as considered by APERC .

8.1.5.4. CERC in its Suo Motu Tariff Order for Renewable Energy Sources Dated 27-03-2012 have stated that the computations of interest on loan carried out for determination of tariff in respect of the RE projects treating the value base of loan as 70% of the capital cost and the weighted average of Base rate prevalent during the first six months plus 300 basis points which works out to an equivalent interest rate of 12.30%.

8.1.5.5. Considering the stakeholder's views and present market conditions, the Commission decides that the current interest rate of 11.75% - 12.50% as mentioned by IREDA in its website is reasonable . Therefore, an interest rate of 12.25 % p.a would be adopted on the loan amount outstanding.

8.1.6. Return on Equity

8.1.6.1. The Commission adopted a Return on Equity (RoE) at 19.85% (pre tax) in Order No.3 of 2009 dated 06-05-2009. Empee Sugars & Chemicals Ltd have suggested a RoE of 19.85% pre-tax. IREDA is of the opinion that a rate of 16% after tax be fixed by the Commission. The licensee - TANGEDCO has suggested a RoE of 14% .

8.1.6.2. Considering the views of the stakeholders, the Commission decides to retain the existing Return on Equity at 19.85% (pre tax) for this control period.

8.1.7. Life of plant and machinery

Generally the project life of a plant is considered as 20 years for tariff determination process. Majority of the stakeholders viz Empee Sugars & Chemicals Ltd, IREDA and TANGEDCO have stated that the life of plant & machinery can be considered at 20 years .Therefore, the Commission decides to fix the life of plant and machinery at 20 years for tariff determination.

8.1.8. Depreciation

8.1.8.1. Empee Sugars & Chemicals Ltd and TANGEDCO have requested the Commission to fix the rate of depreciation at 4.5% . IREDA has opined that the depreciation can be calculated at 5.28% for equipment and 10% for others.

8.1.8.2. The Commission has decided to adopt the depreciation rate as proposed by Empee Sugars & Chemicals Ltd and TANGEDCO and approve the rate for depreciation of 4.5% p.a SLM on plant and machinery by reckoning 85% of the capital cost as the cost of plant and machinery. The accumulated depreciation shall however be limited to 90% of the cost of plant and machinery.

8.1.9. Operation and Maintenance Expenses

8.1.9.1. TANGEDCO and SISMA have opined that the Operation & Maintenance (O & M) expenses may be fixed at 4.5% of the capital cost with escalation of 5% from the 2nd year . E.I.D.- Parry (India) Ltd stated that the O & M expenses could be fixed at 1.25% on the total capital cost with 5% escalation from the 2nd year onwards. IREDA has suggested the charges to be at 5% of project cost with 5% escalation . Empee Sugars & Chemicals Ltd requested the Commission to consider the same formula as assumed in Clause 8.9 of the previous Order No 3 Dated 06-05-2009 which states that O & M expenses will be at a rate of 4.5% p.a with escalation of 5% from the second year onwards. With regard to maintenance of land and civil works, which constitutes 15% of capital investment, 0.9% of 15% of capital cost shall be allowed every year with annual escalation of 5%.

8.1.9.2 As regards Insurance charges, Empee Sugars & Chemicals Ltd wants the charges to be as assumed by the Commission in Clause 8.10 in the Order No 3 Dated 06-05-2009 . As per this clause, Commission had proposed an insurance rate of 0.75% of the machinery cost for the first year to be reduced by half a percent of the previous year's insurance cost every year thereafter . The licensee - TANGEDCO has requested the Commission to waive the insurance charges as stipulated by other ERCs.

8.1.9.3. Other SERCs have also included insurance charges in the Operation & Maintenance expenses.

8.1.9.3.1 APERC in its Order Dt 20-03-2004 / 31-03-2009 has considered O & M cost of 3% on capital cost (including insurance) with 4% escalation.

8.1.9.3.2. MPERC in its Order 59/08 Dt 03-09-2008 (valid till 2013) has approved O & M expenses including insurance at 3% of the capital cost with an escalation of 5% on O & M expenses p.a.

8.1.9.3.3. KERC in its Order Dt 11-12-2009 has considered O & M expenses at 1.5% on capital cost with 5% escalation and the O & M expenses is inclusive of insurance charges.

8.1.9.3.4. GERC in its Order 4 of 2010 Dt 31-05-2010 has assumed O & M expenses @ 3% of the capital cost for the first year with 5% escalation thereafter. Here also, O & M expenses is inclusive of insurance charges .

8.1.9.4. The normal practice prevalent is that the insurance charges are included in the O & M charges. Other Commissions have also clubbed the insurance expenditure with O & M expenses. Hence, the Commission decides to include the insurance expenditure with the O & M expenses and therefore no separate provision for insurance is considered in this Order. Many of the Commissions in the country allowed O & M charges @ 3% including insurance with an annual escalation of 5%.

8.1.9.5. Therefore, the Commission approves this rate of 3% with annual escalation of 5% from second year as O & M expenses on 100% of capital cost .

8.1.10. Station Heat Rate

8.1.10.1. The stakeholders in their written submissions gave varying suggestions on the adoption of the Station Heat Rate (SHR). E.I.D.- Parry (India) Ltd and SISMA wanted the SHR to be fixed at 4976 Kcal/KWhr. Kothari Sugars & Chemicals Ltd opined that the SHR should be fixed at 4200 Kcal/KWhr . Tamil Nadu Newsprint and Papers Ltd sought the SHR to be fixed at 3246 Kcal/KWhr . IREDA opined that the SHR be considered in the range of 3800 to 4000 Kcal/KWhr . Empee Sugars & Chemicals Ltd opined that SHR may be fixed at 4032 Kcal/KWhr for Cogen plants with air cooled condensers (i.e 5% higher) . TANGEDCO opined to consider the SHR of 2450 kcal/kwhr as per MERC .

8.1.10.2. The station heat rate considered by CERC for co-generation plants is 3600kcal/kwhr.

8.1.10.3. Cogen plants are generally of higher size unlike biomass plants and therefore, they enjoy economies of scale. Cogen plants also undertake works using advanced technological developments . Therefore, considering the technological development in the cogen plants and the economies of scale , the Commission decides to adopt a station heat rate of 3700 kcal / kwhr.

8.1.11. Gross calorific value of the fuel

8.1.11.1. Empee Sugars & Chemicals Ltd and TANGEDCO requested the Commission to fix the Gross Calorific Value (GCV) of fuel at 2300 Kcal/kg. Tamil Nadu Newsprint and Papers Ltd stated that the GCV be fixed at 5400 Kcal/kg which is based on imported coal. Kothari Sugars & Chemicals Ltd wanted the GCV to be fixed at 2275 Kcal/kg . IREDA stated that the Commission may consider fixing the GCV at 2250 Kcal/kg.

8.1.11.2. Considering the views expressed by the stakeholders , the Commission decides to retain the GCV of fuel at 2300 kcal / kg as fixed in the previous Order No 3 Dated 06-05-2009.

8.1.12. Specific fuel consumption (SFC) :

8.1.12.1. Non-conventional power projects should improve their operational efficiency, notwithstanding the preference given for them. The burden of higher fuel consumption by the power projects resulting in higher costs should not be passed on to the consumers.

8.1.12.2. Various stakeholders gave varying opinions on the SFC to be considered by the Commission. E.I.D.- Parry (India) Ltd has sought the SFC to be fixed at 2.16 Kg / KWhr . Tamil Nadu Newsprint and Papers Ltd opined that the SFC be assumed at 0.601 Kg / Kwhr . Kothari Sugars & Chemicals Ltd asked the Commission to fix the SFC at 1.8 Kg/KWhr . Empee Sugars & Chemicals Ltd, Chennai stated that SFC of 1.75 Kg/Kwhr for Cogen plants with air cooled condensers (i.e 5% higher) be considered . The South India Sugar Mills Association wanted the SFC to be fixed at 2.16 kg/kwhr . IREDA in their views communicated to the Commission suggested fixing the SFC at 1.7 to 1.8 kg/kwhr. Terra Energy Limited stated that the Specific fuel consumption may be fixed at 1.75 to 1.80 kg/kwhr as it depends upon various qualities of fuel used and that the rate of feed of fuel depends upon various factors which are beyond the control of the generator. The licensee - TANGEDCO has requested the Commission to fix the SFC at 1.20 kg/kwhr .

8.1.12.3. Specific fuel consumption is the resultant of Station Heat rate and Gross Calorific Value of fuel. As stated above, the Commission adopts the station heat rate of 3700 kcal / kwhr and fuel calorific value of 2300 kcal / kg, which corresponds to a fuel consumption of 1.61 kg / kWhr.

8.1.13. Fuel Cost:

8.1.13.1. Rajshree Sugars & Chemicals Ltd suggested a rate of Rs 2000 / MT to be fixed as the cost of fuel . E.I.D. Parry (India) Ltd and SISMA have suggested a rate of Rs 2000 / MT with 5% escalation each year . Empee Sugars & Chemicals Ltd requested the Commission to fix a rate of Rs 1750 / MT (inclusive of handling / transportation charges of Rs 250 / MT). Tamil Nadu Newsprint and Papers Ltd suggested a rate of Rs 5100 / MT for usage of Imported coal . IREDA opined that the fuel cost be fixed at Rs 1800-2000 / MT with 5% annual escalation, if purchased from outside. Terra Energy Limited opined that fuel rate may be fixed at Rs.2000 / MT as per current market rates.

8.1.13.2. TANGEDCO suggested a rate of Rs 1000 / MT . CERC in its Renewable Energy Sources Regulations, 2012 has fixed a cost of Rs 1408/Ton with an escalation factor of 5% per annum for Tamil Nadu.

8.1.13.3. It is ascertained from Directorate of Sugar, Chennai that the cane price for 2011-12 is Rs 2000/MT with a transport cost of Rs 100/= totaling to Rs 2100 / MT. Therefore, the Commission decides to adopt the fuel cost at 50% of the above price of Rs 2100 / MT which is Rs 1050 / MT for FY 2012-13. The price for FY 2013-14 will be decided as and when the Government announces the sugar price for the next year. The same would then be adopted by the Commission.

8.1.13.4. However, for arriving at the receivables in connection with determination of interest on working capital, fuel cost is escalated at the rate of 5%.

8.1.14. Components of working capital

8.1.14.1. The Commission in its previous Tariff Order No 3 dated 06-05-2009 fixed the components of working capital on the following norms:

Fuel stock – One month

O & M Expenses – One month

Receivables - One month

8.1.14.2. E.I.D.- Parry (India) has sought the working capital to be based on two months each of Fuel stock, O & M expenses and Receivables. Empee Sugars & Chemicals Ltd suggested that working capital can comprise of six months receivables due to late realization of payment from TANGEDCO. TANGEDCO , however opined that the Commission may consider the norms as One month each for Fuel stock, O & M expenses and Receivables. SISMA opined that the working capital components can comprise of six months Receivables , 2 months O & M expenses and 2 months cost of fuel stock . IREDA have suggested that three months of Receivables and two months for Fuel stock and expenses may be considered.

8.1.14.3. Considering the processing period of power generation and the contractual period for billing and payment, the Commission decides to approve the working capital on the basis of one month each of Fuel stock, O & M expenses and Receivables.

8.1.15. Interest on working capital

8.1.15.1. E.I.D.- Parry (India) Ltd have suggested a rate of 14% p.a. for the interest on working capital. Empee Sugars & Chemicals Ltd have suggested an interest on working capital of 15% p.a . The South Indian Sugar Mills Association have suggested that the Commission adopt a rate of 14.5% p.a. TANGEDCO have opined that the Commission consider the interest on working capital at 10.25% p.a. CERC in its Suo Motu Tariff Order for Renewable Energy Sources dated 27-03-2012 have stated that interest rate for working capital is considered as weighted average of State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points. This is equivalent to interest rate of 12.80%.

8.1.15.2. IREDA in their website has tabulated the interest rates applicable from 16-08-2011 to various sectors. As per the said report, the interest rate applicable to Co-generation plants is in the range of 11.75% - 12.5% .

8.1.15.3. Considering the present market conditions and lending pattern of financial institutions and the short term nature of working capital, the Commission decides to fix the interest rate at the upper limit of the interest rate charged by IREDA. . Therefore, an interest rate of 12.5% p.a would be adopted for the working capital.

8.1.16. Auxiliary Consumption

8.1.16.1. Tamil Nadu Newsprint and Papers Ltd and Empee Sugars & Chemicals Ltd, have suggested 10% auxiliary consumption to be considered in the current tariff order . IREDA has opined that the auxiliary consumption be fixed at 10 – 12%. TANGEDCO have requested the Commission to fix the auxiliary consumption at 8.5% .

8.1.16.2. Considering the technology improvements and availability of efficient machinery , the Commission has decided to adopt auxiliary consumption at 9% .

8.2 Related Issues

The following are the related issues for energy generation from bagasse based co-generation plants :

1. Transmission and wheeling charges
2. Cross subsidy surcharge
3. CDM benefits
4. Reactive power charges
5. Grid availability charges
6. Adjustment of energy generated
7. Scheduling and system operation charges
8. Application fees and agreement fees
9. Billing and payments
10. Payment security and security deposit
11. Power factor

12. Metering
13. Connectivity and Evacuation of power
14. Energy purchase and wheeling agreement
15. Scheduling of power generation
16. Tariff review period / Control period .

The above charges / terms are applicable to all bagasse based co-gen plants irrespective of their year of installation. These are discussed in detail in the following paragraphs.

8.2.1. Transmission and wheeling charges

8.2.1.1. The Commission in its Order No 3 dated 06-05-2009 has adopted transmission and wheeling charges including line losses at 5% for HT / EHT and 7.5% for LT services. Empee Sugars & Chemicals Ltd suggested the Commission to consider the transmission and wheeling charges assumed by the Commission in its Order No 3 Dated 06-05-2009. TANGEDCO requested the Commission to consider the transmission and wheeling charges at 18%.

8.2.1.2. Currently, the Commission in its Order No. 1 of 2012 for TANGEDCO while approving the retail tariff and in Tariff Order No 2 of 2012 for TANTRANSCO has fixed the wheeling charges of 23.27 paise / kWh and Transmission Charges of Rs.6483 /MW / day . Now that TNEB has been unbundled, charging in kind as Transmission and wheeling charges will not serve its purpose. Therefore, it has been decided to fix the transmission and wheeling charges in terms of rupees / paise as in the case of conventional power.

8.2.1.3. As a promotional measure under section 86 (1) (e) of the Electricity Act 2003, the Commission decides to adopt 60% of the transmission charges and 60% of wheeling charges of conventional power to the bagasse based co-generation plants. Apart from these charges, actual line losses as specified in the respective Orders of the Commission and as amended from time to time are also deductible in kind for the captive use and third party sale.

8.2.1.4. ***For generators who are availing Renewable Energy Certificates , normal transmission charges, wheeling charges and line losses will apply***.

8.2.2. Cross subsidy surcharge

8.2.2.1. TANGEDCO has opposed preferential treatment for bagasse based cogeneration power plants in the matter of cross subsidy surcharge. They have requested to levy cross subsidy surcharge as applicable for normal open access consumers.

8.2.2.2. E.I.D.- Parry (India) Ltd, Empee Sugars & Chemicals Ltd , SISMA and Terra Energy have requested the Commission not to levy cross subsidy surcharges for third party use so that the use of Non Conventional Sources of Energy (NCES) can be promoted. EID Parry India Ltd requested the Commission to frame norms for group companies who supply power within their group as they are presently being charged cross subsidy surcharge. In addition, they also requested the Commission to consider waiving the cross subsidy surcharge.

8.2.2.3. Cross subsidy surcharge shall be leviable as per the provisions of the Act, Rules and Regulations made thereunder . The Commission in its Order No. 1, 2 and 3 of 2009 fixed 50% of the cross subsidy surcharge for wind, biomass and bagasse based generators as a promotional measure for renewable energy. On similar lines, Commission decides to continue to adopt 50% of the applicable cross subsidy surcharge for Bagasse based cogeneration projects.

8.2.3. CDM benefits

8.2.3.1. E.I.D.- Parry (India) Ltd and SISMA stated that the CDM benefits should accrue only to the project developers and need not be shared with the licensee as the money for availing these benefits is spent by the generators. Terra Energy Ltd suggested that 100% CDM benefits may be given to the generators as they are not receiving any REC benefits.

8.2.3.2. TANGEDCO suggested that the CDM benefits and sharing of CDM benefits can be as specified in Order No 3 of 2009. Empee Sugars & Chemicals Ltd opined that CDM benefits treatment may be as per Clause 9.3 of the Order No 3 Dated 06-05-2009 of the Commission. Clause 9.3 of the Order states that the formula suggested by the Forum of Regulators (FOR) was followed by the Commission.

8.2.3.3. The FOR has recommended that CDM benefits should be shared on gross basis starting from 100% to developers in the first year and thereafter reducing by 10% every year till the sharing becomes equal (50:50) between the developer and the consumer in the sixth year. Thereafter, the sharing of CDM benefits will remain equal till such time the benefits accrue.

8.2.3.4. Therefore, in line with the formula recommended by FOR, the Commission decides to adopt the same formula for Bagasse based cogen plants . The Distribution Licensee shall account for the CDM receipts in the next ARR filing.

8.2.4. Reactive power charges

8.2.4.1. E.I.D.- Parry (India) Ltd and SISMA have stated that reactive power charges should be as per the Grid Code . Rajshree Sugars & Chemicals Ltd wanted the Commission to either waive the reactive charges collected by TANGEDCO or pass orders for payment for reactive energy generated by Cogen plants. Empee Sugars & Chemicals Ltd has sought for the charges to be fixed as assumed by the Commission in Clause 9.4 in Order No 3 Dated 06-05-2009. As per this clause, Reactive power charges would be as per the Indian Electricity Grid Code and 5.75 paise/ kvarh would be charged from 01-04-2009 and escalated by 0.25 paise/ kvarh every year thereafter.

8.2.4.2. TANGEDCO has sought for the reactive power charges as per the Commission's Order 2 of 2006. The Commission in its Order in T.O No 2 of 2012 dated 30-03-2012 has fixed the reactive power charges at 10 paise / kVARh escalated at 0.5 paise / kVARh annually in subsequent years, unless otherwise revised by the Commission.

8.2.4.3. The Commission decides that the Reactive power charges shall be 10 ps / KVARh as per Tariff Order No 2 of 2012 dated 30-03-2012 . As and when this Order is amended, the amended charges would become payable.

8.2.5. Grid availability charges

8.2.5.1. Empee Sugars & Chemicals Ltd has suggested that the Grid Availability charges be fixed as per Clause 9.5 of the Commission's Order No 3 Dated 06-05-2009. TANGEDCO has proposed that these charges be fixed as per Commission's Order No 2 of 2006.

8.2.5.2. In this regard, the Commission rules as follows :

a) Start up power

If a generator is an open access customer, the startup power shall be provided by the Distribution Licensee for a maximum period of 42 days in a year, subject to the limitation of demand not exceeding 15% of the capacity of the generator . The generator shall pay the distribution licensee at the rate applicable for temporary supply of that voltage category.

b) Stand by power

If adequate generation does not materialize or if drawal by the captive / third party consumer exceeds generation, the energy charges and demand charges shall be regulated as follows:

1) Energy charges

As on date, there is only one Distribution Licensee in this State. If the captive user or the third party user is a consumer of the Distribution Licensee, the captive or third party consumer shall be liable to pay the Distribution Licensee , the tariff applicable to that category of the consumer for the net energy consumption subject to the terms and conditions of supply. If the captive user / third party user is not a consumer of the distribution licensee, the user shall pay the charges as applicable to the temporary supply of that voltage category.

2) Demand charges

a) Demand charges are governed by the provisions of Supply Code, Distribution Code and the applicable Tariff Order issued by the Commission from time to time. Sections 9 and 42 of the Electricity Act 2003 enables consumption of electricity from the captive generating plant. Proviso to Section 42 envisages that surcharge shall not be leviable in case open access is provided to a person who has established captive generation plant for carrying the electricity to the destination of his own use. This is also reflected in the note to Regulation 9 (2) which is reproduced below:-

“Provided that such surcharge was not be levied in case transmission access is provided to a person who has established a captive generation plant carrying the electricity to the destination of his own use.”

b) In the Tariff Order issued by the Commission in 2006 and 2009, the concept of deemed demand was introduced with a view to reduce the demand charges. This is opposed by the TANGEDCO as they are unable to recover the full demand charges relating to providing all the infrastructure facilities as well as tying up of the generation capacity. This matter was examined in detail. The Commission observes that

i) When the captive power plant is not generating power, the licensee is obliged to provide power supply to the consumer. During this period , no wheeling charge is recoverable as the captive generator is not injecting any power. The fixed charges payable to other generating stations or procurement of power from the market to meet such contingency will devolve on the licensee.

ii) If the captive generator is generating throughout the year, he could always reduce the sanctioned demand and control his demand charges for the supply to be made only by the licensee.

iii) Since the open access regulations cast a duty on the licensee to provide electricity to all open access customers whether captive or otherwise, in case of non generation by such generators, the fixed charge is getting shifted to the licensee.

iv) Keeping in view the above, the Commission decides to withdraw the deemed demand concept followed so far. The Commission also observes that such deemed demand concept is not prevalent in many other states in India.

8.2.6 Adjustment of energy generated

8.2.6.1. Empee Sugars & Chemicals Ltd wanted the Commission to permit captive consumption for LT / HT services as the minimum limit of 1 MW for intrastate open access is already lifted . TANGEDCO suggested that the adjustment of energy generated as specified in the TNERC Order 3 of 2009 be adopted.

8.2.6.2. The Commission decides that the adjustment of generated energy shall be as per the Commission's Open access Regulations in force .

8.2.7. Scheduling and system operation charges

8.2.7.1. Empee Sugars & Chemicals Ltd requested the Commission to adopt the same charges as assumed by the Commission in Clause 9.7 of Order No 3 Dated 06-05-2009. TANGEDCO suggested that the scheduling and system operation charges of Rs 300 / MW may be enhanced to Rs 1000 / MW.

8.2.7.2. The Commission, however decides that the Scheduling and system operation charges shall be as per the Commission's Order issued on Open access charges from time to time. Presently, it is Rs 2000 / day irrespective of the capacity as per Commission's Tariff Order No 2 of 2012 dated 30-03-2012.

8.2.8. Application fees and agreement fees

8.2.8.1. Empee Sugars & Chemicals Ltd have requested the Commission to assume the same charges as assumed in Clause 9.8 in the Order No 3 Dated 06-05-2009 of the Commission. TANGEDCO has suggested that the Commission fix the Open access Application fees at Rs 1000 / MW and wheeling agreement fees at Rs 1,00,000/=.

8.2.8.2. In this regard, the Commission states that the Intra State Open Access Regulations 2005 of the Commission was amended in 2008 to provide for concessional application fees and agreement fees for generators of non-conventional and renewable sources of energy.

8.2.8.3. The application fees and agreement fees for the Energy Purchase and Energy Wheeling Agreements shall be as specified in the Commission's Intra State Open Access Regulations 2005 and Fees and Fines Regulations 2004 in force. The fees for EPA shall be collected by the licensee and passed on to the Commission. Whenever the Commission revises the above fees, the revised fees shall be payable by the Bagasse based co-generators.

8.2.8.4. Whenever there is change in the usage of energy from bagasse based co-gen or a change in the drawl point etc , there will be extra work to the licensee. Therefore, an additional fees equivalent to the application fees and agreement fees shall be leviable by the licensee on the generator.

8.2.9. Billing and payments

8.2.9.1. Rajshree Sugars & Chemicals Ltd stated that the bills be settled within 30 days from date of submission of invoice and 1% interest be levied if payment is delayed beyond 30 days . Empee Sugars & Chemicals Ltd stated that payment should be made within 30 days, though actual payment is being received after 6 months. SISMA said that payment should be made within 30 days and any delay should attract interest as per TNERC Order 3 of 2009. They also sought 18% penal interest on the interest on delayed payments as there is a delay in getting timely payments. EID Parry India Ltd have suggested that the Commission may consider giving the bagasse based co-generators the interest cost as the principal itself is not being paid. The payments were getting delayed causing the farmers to stop cultivating sugarcane and moving over to cultivate other crops.

8.2.9.2. TANGEDCO have sought for waiver of payment of penalty of 1% per month for delayed payment towards power purchase bills beyond 30 days considering the precarious financial position of TANGEDCO.

8.2.9.3. The Commission decides that when a renewable energy generator sells power to the distribution licensee, the generator will raise a bill every month for the net energy sold after deducting the charges for start up power and reactive power. As the interest at the rate of 12.5% has already been allowed for one month receivables in the working capital, the bill amount is due only after one month. If the distribution licensee makes the payment within a period of one month of presentation of bills by a generating company, a rebate of 1% shall be allowed. Any delayed payment beyond 30 days is liable for interest at the rate of 1% per month.

8.2.9.4. The Commission decides that a bagasse based co-generator utilizes the power for captive use or if he sells it to a third party, the distribution licensee shall raise the bill at the end of the month for the net energy supplied. The licensee should record the generation and consumption on the same day as far as possible. While preparing the bill, peak hour generation shall be adjusted against peak hour consumption. Off-peak hour generation shall be adjusted against off-peak hour consumption. Normal hour generation shall be adjusted against normal hour consumption.

8.2.9.5. Peak, Off-peak and normal hours shall be as defined in Terms & Conditions for Determination of Tariff Regulations 2005 as amended from time to time. Presently, as per Clause 11 (2) of the Terms and Conditions for determination of Tariff Regulations, 2005 defines Peak hour as " *the time between 0600 hrs and 0900 hrs and between 1800 hrs and 2100 hours ."* Clause 11 (3) of the Terms and Conditions for determination of Tariff Regulations, 2005 defines off-peak hour as " *the duration between 2200 hours and 0500 hrs.* Balance hours are normal hours.

8.2.9.6. The Commission also decides that the Peak hour generation and normal hour generation can be adjusted against off-peak consumption. Excess consumption will be charged at the tariff applicable to the consumer as per the Regulations / Orders of the Commission in force. Appropriate transmission and wheeling charges, scheduling and system operation charges and cross subsidy surcharge, wherever applicable, shall be recovered from the open access consumer. The net amount recoverable from the consumer shall be raised in the bill as per their normal billing schedule .

8.2.10. Payment security and security deposit

8.2.10.1. Empee Sugars & Chemicals Ltd have stated that even though no security deposit is made with the licensee, TANGEDCO does not pay any penalty for delayed payment . EID Parry (India) Ltd mentioned that payment of security deposit of three months should be provided by the distribution licensee to the co-generators . SISMA suggested that bankable security may be provided in favour of generators and that the payment security mechanism as suggested by the Commission should be enforceable. To enable this, TANGEDCO could make payments on the basis of letter of credit . TANGEDCO opined that the payment security and security deposit may be prescribed as per the Commission's Order 3 of 2009.

8.2.10.2. The Tariff Policy calls for adequate and bankable security arrangements to the generating companies. This mechanism has been found impractical, as there are more number of generators and the monolith distribution licensee is unable to offer security for such numbers. Therefore, the Commission believes that interest for delayed payment by the licensee prescribed in the earlier Para at 1% p.m would serve the ends of justice.

8.2.10.3. Regarding the security deposit of the consumer, the Commission decides that two times the maximum net energy supplied by the distribution licensee in any month in the preceding financial year shall be taken as the basis for the payment of security deposit by the consumers.

8.2.11. Power factor

8.2.11.1. Empee Sugars & Chemicals Ltd wanted the Power factor to be as assumed by the Commission in Clause 9.11 of Order No 3 Dated 06-05-2009. TANGEDCO stated that the Commission may continue with the formula as prescribed in Order No 3 of 2009.

8.2.11.2. As per the Retail Tariff Order in force, power factor disincentive is applicable to a consumer as a percentage of current consumption charges. The average power factor recorded by the meter shall be the reference for calculation of the disincentive . On the same analogy, captive / third party consumers of bagasse based co-generation plants shall be liable for disincentive based on the average power factor recorded by the meter. This system may change if kVAh billing is introduced.

8.2.12. Metering

8.2.12.1. Empee Sugars & Chemicals Ltd stated that metering may be retained as defined by the Commission in Clause 9.12 of Order No 3 Dated 06-05-2009. TANGEDCO is also of the view that the same procedure as prescribed in the Commission's Order 3 of 2009 may be continued.

8.2.12.2. The Commission decides to adopt the metering and communication in accordance with the following Regulations / Codes, as amended from time to time :

(a) Central Electricity Authority (Installation and Operation of Meters) Regulations 2006

(b) Tamil Nadu Electricity Distribution Code 2004

(c) Tamil Nadu Electricity Grid Code 2004

(d) Tamil Nadu Electricity Regulatory Commission–Intra State Open Access Regulations 2005 .

8.2.13. Connectivity and Evacuation of power

8.2.13.1. Empee Sugars & Chemicals Ltd have stated that evacuation of energy may be as provided by the Commission in Clause 9.13 of its Order No 3 Dated 06-05-2009 . TANGEDCO is of the opinion that the entire cost should be borne by the generating companies.

8.2.13.2. The Commission rules that connectivity and power evacuation system shall be provided as per the Act, Codes, Regulations and Orders in force.

8.2.14. Energy purchase and wheeling agreement

8.2.14.1. Empee Sugars & Chemicals Ltd opined that the Energy purchase agreement and Energy wheeling agreement be on the same lines as ordered by the Commission in Clause 9.14 and 9.15 of Order No 3 Dated 06-05-2009 . SISMA stated that as guaranteed payments are necessary from TANGEDCO, a flexibility mechanism can be inbuilt into the PPA. EID Parry India Ltd suggested that PPA terms be made flexible whenever the availability of sugarcane is less. TANGEDCO stated that the entire cost of power evacuation is to be borne by generating companies .

8.2.14.2. In this regard, the Commission decides that the format of the Energy Purchase Agreement (EPA) shall be evolved as specified in the Commission's Regulations in force. The agreement shall be valid for a minimum period of twenty years. The distribution licensee shall execute the Energy Purchase Agreement within a month of receipt of application from the generator. The parties to the agreement may be given the option of exiting in case of violation with three months notice to the other party.

8.2.14.3. The format of the Energy Wheeling Agreement (EWA) shall be evolved as specified in the Commission's Regulations in force . The period and other terms of agreement shall be as per the terms of Open Access Regulations issued by the Commission.

<u>8.2.15 Scheduling of power generation</u>

8.2.15.1. E.I.D.- Parry (India) Ltd and SISMA have stated that scheduling is not possible to be implemented due to the vagaries of monsoon and the quantum of cane crushed . Empee Sugars & Chemicals Ltd stated the Commission may adopt the same assumption as in Clause 9.7 of its Order No 3 Dated 06-05-2009 . TANGEDCO stated that Generating company may give daily schedule of generation in MW.

8.2.15.2. The Commission reiterates that the generator shall follow the scheduling procedure as specified in Indian Electricity Grid Code and Tamil Nadu Electricity Grid Code and other Regulations, Codes and Orders of the Commission. Depending upon the availability of Bagasse, the generators should be in a position to declare the availability on a day-ahead basis.

<u>8.2.16 : Tariff review period / Control period</u>

Clause 6 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 of the Commission specifies that the tariff as determined by the Commission shall remain in force for such period as specified by the Commission in such tariff orders and the control period may ordinarily be two years. Hence, the Commission decides that the control period of this Order shall be for two years from 01-08-2012 and tariff period is twenty years.

9.0. Tariff

With the adoption of above financial and operational parameters the **tariff rate for the new plants** works out as follows:

9.1 Fixed costs:

(Rs/unit)

Year	FCC
1	2.11
2	2.13
3	2.06
4	2.00
5	1.93
6	1.87
7	1.81
8	1.75
9	1.69
10	1.63

(Rs / unit)

Year	FCC
11	1.57
12	1.52
13	1.54
14	1.57
15	1.61
16	1.64
17	1.67
18	1.71
19	1.75
20	1.79

9.1.1. Further, there would be a reduction of 10% in the fixed costs as discussed in Para 8.1.1 (i.e Capital Cost) for apportioning the FCC between co-gen and sugar mills for use of steam in sugar mills. Consequently, the tariff rates for the new plants are worked out as follows :

(Rs/unit)

Year	FCC
1	1.90
2	1.91
3	1.85
4	1.80
5	1.74
6	1.68
7	1.63
8	1.57
9	1.52
10	1.47

(Rs / unit)

Year	FCC
11	1.41
12	1.36
13	1.39
14	1.42
15	1.44
16	1.47
17	1.51
18	1.54
19	1.57
20	1.61

9.2 Variable Costs:

9.2.1. The variable cost for the financial year 2012-13 will be Rs.1.86 per unit. For the financial year 2013-14, the rate would be decided by the Commission as discussed in Clause 8.1.13.

9.2.2. The fixed capacity charges specified in this Order will be applicable with reference to the date of commissioning of the plant and the variable cost will be applicable with reference to the financial year. The Fixed capacity charges specified above will continue to be applicable for the entire agreement period of 20 years. The fixed charges contained in this order will be applicable to the plants commissioned on or after 01-08-2012 and the variable cost will apply for all plants commissioned on or after 15-05-2006.

10. Tariff for the plants commissioned before 15-05-2006

10.1. Chief Engineer, NCES, TANGEDCO filed P.P.A.P. No.3/2011 before the Commission with a prayer to fix the tariff applicable to bagasse based co-generation plants and biomass plants commissioned before 15-05-2006 for the period from 01-04-2010, since tariff was provided upto 31-03-2010 only in the respective PPAs.

10.2. The petition was heard by the Commission on 11-07-2011 and TANGEDCO was directed to file separate petitions for bagasse based co-generation plants and biomass plants individually. The Commission further directed the Biomass generators and bagasse based co-generation plants and TANGEDCO to file their views / comments by 31-07-2011.

10.3. Subsequently, TANGEDCO in their submissions stated that the bagasse based co-gen plants commissioned between 1992 and 1999 have recovered the fixed cost components of Interest, Insurance, Depreciation and RoE and that only variable component of power purchase tariff may be considered while fixing the tariff from 01-04-2010. TANGEDCO also submitted a list of bagasse based co-gen plants which were commissioned based on PPAs entered prior to 15-05-2006. On the other hand, the co-gen plants have requested to allow 5% escalation per annum on the existing tariff as on 31-03-2010.

10.4. In this matter , the Commission decides that determination of tariff for the plants commissioned prior to 15-05- 2006 will be dealt with while disposing the petition No PPAP 8 of 2011 filed by TANGEDCO .

11 . Tariff for Cogeneration plants tied up with other Industries

11.1. Tamil Nadu Newsprint & Papers Ltd (TNPL) speaking on behalf of the bagasse based sugar mills with which they have tie up for supply of bagasse stated that these plants are not covered under Order 3 of 2009 or Order 4 of 2006 as they are using fossil fuel. Considering the contribution made by TNPL and the sugar mills for saving the environment wherein cutting of trees growing on 40000 acres of land is avoided, they requested the Commission to fix the tariff for the sugar mills having tie up with TNPL by considering the actual workings of variable cost of Rs 3.507 / unit at present cost of imported coal and with suitable escalation factors for increase in cost of coal for subsequent years along with the fixed cost as determined by the Commission. They also requested the Commission to fix the tariff for the energy generated beyond 55% PLF as applicable for other sugar mills. Alternatively, TNPL stated that the Commission can also fix the tariff retaining the fixed cost as that of bagasse based co-gen plants along with a variable cost 5% lesser than the variable cost for bagasse based co-gen plant.

11.2. SISMA opined that as there is a fuel supply arrangement between the sugar mill and the paper industry and as both the industries contribute for protecting the environment , a separate tariff may be considered as sought for by TNPL. EID Parry India Ltd requested that they also be treated on par with TNPL with regard to tariff.

11.3. In this regard, it is to be stated that P.P.A.P No 1 of 2011 was filed by M/s Sakthi Sugars Ltd, Chennai and M/s Tamil Nadu Newsprint and Papers Ltd . In this petition, M/s Sakthi Sugars and M/s TNPL pleaded for creation of new tariff category in respect of these plants . The Commission issued an interim Order on 02-03-2011 fixing an interim tariff of Rs 3.01 / unit for the power supplied by M/s Sakthi Sugars to TANGEDCO using coal as fuel. As the Commission is seized of this matter , orders on determination of tariff will be issued separately in case of petition - PPAP No 1 of 2011 .

12. Acknowledgement

The Commission would like to place on record and acknowledge with thanks , the contribution by the officers and staff of the Commission and the valuable guidance provided by the experts and members of the State Advisory Committee. The Commission also appreciates the active participation of all the stakeholders , IREDA and inputs offered by TANGEDCO, which have been helpful to the Commission in finalizing this Tariff Order .

Sd/-	Sd/-
(S.Nagalsamy)	**(K.Venugopal)**
Member	**Member**

/By order of the Commission/

-sd-
S. Gunasekaran
Secretary

ANNEXURE I

PUBLIC NOTICE

The Commission proposes to revise the Comprehensive Tariff Order on Bagasse based co-generation plants, Order No 3 of 2009 dated 06-05-2009. The Commission invites the views / suggestions of stakeholders on the following parameters ;-

1. Capital cost per MW
2. Plant Load Factor (PLF)
3. Debt – Equity ratio
4. Term of loan
5. Interest rate for the loan
6. Return on Equity
7. Life of plant and machinery
8. Depreciation
9. O & M Expenses per year
10. Insurance expenditure per year
11. Station Heat rate
12. Gross calorific value of the fuel
13. Specific fuel consumption
14. Fuel cost per MT
15. Components of working capital
16. Interest on working capital
17. Auxiliary consumption
18. Transmission and wheeling charges
19. Cross subsidy surcharge
20. CDM benefits and sharing of CDM benefits
21. Reactive power charges
22. Grid availability charges
23. Adjustment of energy generated
24. Scheduling and system operation charges
25. Application fees and agreement fees
26. Billing and payments
27. Payment security and security deposit

28. Power factor
29. Metering
30. Evacuation of energy
31. Energy purchase and wheeling agreement
32. Renewable energy purchase obligation
33. Scheduling of power generation
34. Any other issues .

The stakeholders are requested to furnish their views suggestions by 31-05-2011

-Sd/-

(R.V.RAJAH)
Secretary

<u>ANNEXURE II</u>

The list of stakeholders who submitted written comments

1. E.I.D.- Parry (India) Ltd, Chennai
2. The South Indian Sugar Mills Association, Chennai
3. Empee Sugars & Chemicals Ltd, Chennai
4. Indian Renewable Energy Development Agency Ltd, New Delhi
5. Rajshree Sugars & Chemicals Ltd, Chennai
6. Tamil Nadu Generation and Distribution Corporation Ltd, Chennai
7. Kothari Sugars & Chemicals Ltd, Chennai
8. Tamil Nadu Newsprint and Papers Ltd, Chennai

ANNEXURE III

The list of State Advisory Committee members who participated in the meeting on 29-03-2012

1. Thiru K Venugopal. Member, TNERC
2. Thiru S Nagalsamy, Member , TNERC
3. Thiru S Gunasekaran, Secretary, TNERC and Secretary, SAC
4. Thiru Rajeev Ranjan, CMD, TNEB Ltd & TANGEDCO Ltd and Chairman, TANTRANSCO Ltd
5. Thiru Sudeep Jain, CMD, TEDA
6. Tmt M.P.Nirmala, Secretary to Government, Co-operation, Food & Consumer Protections Department, GoTN
7. Thiru M.C.Murali, Chief Electrical Engineer, Southern Railways
8. Thiru K.R Thangaraj, Member, SAC
9. Thiru K.Kathirmathiyon, Member, SAC
10. Thiru N.K.Ranganath, Member , SAC
11. Thiru K Alagu, Member, SAC
12. Thiru K. Kasthurirangaian, Member, SAC
13. Thiru R. Desikan, Member, SAC

Special Invitee :

1. Thiru Prashant M Wadnere, Deputy Secretary to Government, Finance Department, GoTN

ANNEXURE IV

The list of stakeholders who presented their views in the hearing held on 08-06-2012 at the Institution of Engineers (India) Building at Chennai.

1. Thiru. R. Armugam, Senior Manager, Tamil Nadu Newsprints and Papers Limited
2. Thiru. N. Ramanathan, President, Southern India Sugar Mills Association
3. Thiru. G. Rajagopal, TERA Energy Limited
4. Thiru. Ravindra Singh, MD, EID Parry Limited
5. Thiru. Ravindra Singh, MD, EID Parry Limited
6. Thiru. K.N. Radhakrishnan, Vice President Commercial, EID Parry
7. Thiru. Akshay Kumar, Director (Transmission Projects) TANTRANSCO / Director (Generation) i/c TANGEDCO.

ANNEXURE V

The list of participants at the hearing held on 08-06-2012 at the Institution of Engineers (India) Building at Chennai.

1. Mr. P. Ravishankar, IOTMabagas Ltd.,Nahur, Mumbai.

2. Mr. C.S. Sathyanarayanan, Terra Energy Ltd.,112, Nungambakkam High Road, Eldorado, Chennai 34.

3. Mr. D.P. Kumaresan, Century Casting Group

4. Mr. R. Palaniappan.

5. Mr. K.N. Rathinavelu,The South India Sugar Mills Association .

6. Mr. J.S. Sivasubramanian, Sakthi Sugars.

7. Mr. M. Silvester,President – Operations, Kothari Sugars, 115, Mahatma Gandhi Salai, Chennai – 34

8. Mr. Kulothungan, OGPC / Chennai

9. Ms. K.B. Shoba, General Manager (Fin –Mktg), ETA PowerGen P Ltd.,Buhari Town , 6th Floor, Moores Road, Chennai - 6

10. Mr. S. Balagurunathan, Director, RE & Carbon NORDIC India Solutions, Chennai 600 032.

11. Mr. P.T. Vijayan, Auromira Senergy P Ltd., 11, Thousand Lights, Chennai 6

COMPONENTS OF BAGASSE BASED CO-GENERATION TARIFF **ANNEXURE VI**

Sl No	PARAMETERS	VALUES
1	Capital Investment	Rs 4.20 Cr / MW
2	Plant Load Factor	55%
3	Debt Equity Ratio	70 : 30
4	Term of Loan	10 years with one year moratorium
5	Interest on loan	12.25% p.a
6	Return on Equity	19.85% (pre-tax)
7	Life of the plant	20 years
8	Depreciation on 85% of capital investment	4.5% p.a on SLM on 85% of capital cost
9	O & M charges for 100% of capital investment including insurance	3% with escalation of 5% from 2nd year on 100% of capital cost
10	Station Heat Rate	3700 kcal/ kwh
11	Calorific value of fuel	2300 kcal / kg
12	Specific fuel consumption	1.61 kg / kwh
13	Fuel cost	Rs 1050 / MT
14	Working capital componants	One Month Fuel stock, One month O & M and One month Receivables
15	Interest on working capital	12.5% p.a
16	Auxiliary consumption	9.00%

WORKING SHEET FOR TARIFF COMPUTATION FOR BAGASSE BASED CO-GENERATION PLANTS **ANNEXURE VII**

Year	O & M charges for machinery (Rs)	Interest on loan (Rs)	Depreciation (Rs)	Fuel cost (Rs)	Working capital (Rs)					Return on Equity (Rs)	Total Fixed Cost (Rs)	Units generated Less Auxilliary consumption (Units)	Fixed Cost (Rs / unit)	Variable Cost (Rs / unit)	Total Cost without discount (Rs / unit)	Fixed Cost 10% discount due to approtionment of costs (Rs / unit)	Total Cost with discount (Rs / unit)
					O & M expenses	Fuel	Receivables	Total Working Capital	Interest on Working Capital								
1	1260000	3601500	1606500	8144829	105000	678736	1449423	2233159	279145	2501100	9248245	4384380	2.11	1.86	3.97	1.90	3.76
2	1323000	3601500	1606500	8552070	110250	712673	1489435	2312357	289045	2501100	9321145	4384380	2.13			1.91	
3	1389150	3241350	1606500	8979674	115763	748306	1501119	2365187	295648	2501100	9033748	4384380	2.06			1.85	
4	1458608	2881200	1606500	9428658	121551	785721	1514903	2422175	302772	2501100	8750179	4384380	2.00			1.80	
5	1531538	2521050	1606500	9900091	127628	825008	1530893	2483529	310441	2501100	8470629	4384380	1.93			1.74	
6	1608115	2160900	1606500	10395095	134010	866258	1549199	2549467	318683	2501100	8195298	4384380	1.87			1.68	
7	1688521	1800750	1606500	10914850	140710	909571	1569937	2620218	327527	2501100	7924398	4384380	1.81			1.63	
8	1772947	1440600	1606500	11460592	147746	955049	1593228	2696023	337003	2501100	7658149	4384380	1.75			1.57	
9	1861594	1080450	1606500	12033622	155133	1002802	1619201	2777135	347142	2501100	7396786	4384380	1.69			1.52	
10	1954674	720300	1606500	12635303	162889	1052942	1647988	2863819	357977	2501100	7140551	4384380	1.63			1.47	
11	2052407	360150	1606500	13267068	171034	1105589	1679731	2956354	369544	2501100	6889701	4384380	1.57			1.41	
12	2155028		1606500	13930422	179586	1160868	1714577	3055031	381879	2501100	6644507	4384380	1.52			1.36	
13	2262779		1606500	14626943	188565	1218912	1783011	3190488	398811	2501100	6769190	4384380	1.54			1.39	
14	2375918		1606500	15358290	197993	1279857	1854866	3332717	416590	2501100	6900108	4384380	1.57			1.42	
15	2494714		1606500	16126204	207893	1343850	1930315	3482058	435257	2501100	7037571	4384380	1.61			1.44	
16	2619450		1606500	16932515	218287	1411043	2009535	3638866	454858	2501100	7181908	4384380	1.64			1.47	
17	2750422		1606500	17779140	229202	1481595	2092717	3803514	475439	2501100	7333461	4384380	1.67			1.51	
18	2887943		1606500	18668097	240662	1555675	2180057	3976394	497049	2501100	7492592	4384380	1.71			1.54	
19	3032340		1606500	19601502	252695	1633459	2271765	4157919	519740	2501100	7659680	4384380	1.75			1.57	
20	3183957		1606500	20581577	265330	1715131	2368058	4348519	543565	2501100	7835122	4384380	1.79			1.61	

Note : Fuel cost is escalated at the rate of 5% for arriving at the receivables in connection with determination of interest on working capital