1. Introduction

This Tariff order is the second on Bagasse based co-gen power generation. This is a culmination of a consultative process spread over eleven months beginning in July 2008. Tamil Nadu being a pioneer in renewable energy generation, the Commission has analysed the connected issues in great depth before finalising the comprehensive tariff order.

1.1 The importance of Renewable Energy Sources

Global concern over pollution and several related issues caused by the increase in green house gas emission and consequent changes in climate have resulted in a paradigm shift in the approach towards development of the energy sector in many countries. The need for adoption of clean technology, improving end use efficiency and diversifying energy bases etc., have all been seriously considered by the Government of India since the Sixth Five Year Plan and the country is poised for a considerable increase in the use of renewable energy sources in its transition to a sustainable energy base. Renewable energy sources such as wind, solar, hydro, bio mass and co-generation not only augment energy generation but also contribute to improvement in the quality of the environment, drought control, energy conservation, employment generation, upgrading of health and hygiene, social welfare, security of drinking water, increased agricultural yield and production of bio-fertilizers. The pace of development has been accelerated by the Government through promotional policies and fiscal and tax incentives.

1.2 Commission's Regulation on New and Renewable Energy Source

Section 61 of the Electricity Act 2003 (Central Act 36 of 2003) stipulates that the State Electricity Regulatory Commission shall specify the terms and conditions for the determination of tariff. In accordance with the above stipulation, the Commission notified the "Power Procurement from New and Renewable Sources of Energy Regulations 2008" on 8-2-2008. It has been specified in the above Regulation that the tariff determined by the Commission shall be applicable for a period of twenty years and the control period may be ordinarily two years.

1.3 Commission's order on Non Conventional Energy Sources (NCES) based generation and allied Issues

The Commission notified Order No. 3 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 15-5-2006. The said order stipulates tariff rates for power procurement by the distribution licensee from Wind Energy Generators (WEGs), biomass based generators and bagasse based co-generators. In the said order the Commission decided to adopt a control period of three years. The next tariff revision is due from 15.6.2009.

1.4 Representation from bagasse based power generators

For the past one year, bagasse based power generators have repeatedly represented to the Commission that fixed costs such as capital cost, interest rates, maintenance cost, etc and variable cost of the bagasse based co-generation have considerably increased during the last two years. The generators have been repeatedly requesting the Commission to revise the tariff before the control period of three years, taking into account the above escalation in fixed and variable costs. Though there are many factors, which have contributed for the decline in capacity addition, it has been widely reported that the main factor for the decline in capacity is the unattractive tariff in Tamil Nadu.

1.5 Commission's initiative on tariff revision for NCES based generation

In response to the above representations, the Commission conducted a round table conference on 16-7-2008 to elicit the views of wind energy experts, wind turbine manufacturers, wind energy developers, biomass based power generators, bagasse based co-generators and other stake holders. Officials from the Ministry of New and Renewable Energy Source (MNRE), Government of India, Indian Renewable Energy Development Agency Limited (IREDA), Tamil Nadu Energy Development Agency (TEDA) and Tamil Nadu Electricity Board (TNEB) participated in the conference. Based on the views of the participants, the Commission has decided to initiate the process of tariff revision for power procurement from bagasse based co-generation by distribution licensees in the State.

1.6 Commission's order on relaxation of control period

The Commission in its order dated 19-09-2008, against the petitions M.P. Nos. 9, 14 & 23 of 2008 filed by Indian Wind Energy Association (InWEA) and others decided that "the control period of three years as specified in Order No. 3 dated 15.05.2006 is waived from the date of issue of this order".

2. Provisions of the Electricity Act 2003, National Electricity Policy and National Tariff Policy on NCES.

2.1 Preamble of the Electricity Act 2003 reads as follows:

"An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and ***environmentally benign policies*** *constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto."*

2.2. Section 86 (1) (e) of the Electricity Act 2003 states that *the State Commission shall promote co-generation 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.*

2.3. Section 61 (h) of the Electricity Act 2003 states that *the Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for determination of tariff and in doing so shall be guided by the following namely, (h) the promotion of cogeneration and generation of electricity from renewable sources of energy, (i) the National Electricity Policy and Tariff Policy.*

2.4. Related provisions of the National Electricity Policy are quoted below.

"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."

"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."

2.5. Para 6.4 of the National Tariff Policy states as below:-

"(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.

(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.

(3) The Central Commission should lay down guidelines within three months for pricing non-firm power, especially from non–conventional sources, to be followed in cases where such procurement is not through competitive bidding."

2.6. A reading of the National Tariff Policy, National Electricity Policy and the Electricity Act 2003 establishes the overwhelming emphasis on environmental friendly renewable sources of energy such as wind, hydel, solar, bagasse based co-gen and biomass.

3. Bagasse based Co-generation Scenario

3.1 Total installed capacity of power generation in the country is 1, 47,458 MW as on 31.1.2009. The contribution of NCES power to the country's installed capacity is around 13,242 MW *(Source: Central Electricity Authority). The* NCES power represents 9% of the total installed capacity.

3.2 The year wise capacity addition of bagasse based co-generation plants in Tamil Nadu over the past 10 years is furnished below:

Period	**capacity addition (MW)**
Up to 1999-2000	141.60
2000-01	Nil
2001-02	Nil
2002-03	100.50
2003-04	32.00
2004-05	Nil
2005-06	35.00
2006-07	22.00
2007-08	115.00
2008-09 (upto 31-01-09)	20.00
Total	**466.10**

3.3 The steady increase in capacity addition of bagasse based co-generation in Tamil Nadu is mainly attributed to the favourable topographical conditions, fuel availability and the policies of the State that encourage NCES.

4. Generation – Demand gap in Tamil Nadu

4.1 The generating capacity connected to TNEB's grid including the allocation from Central Generating Station is 10214.55 MW as on 31.01.2009 comprising 2970 MW from TNEB's four thermal stations, 516 MW from four gas turbine stations, 2187 MW from 33 hydro stations, 17.55 MW from TNEB's wind farm, 1180 MW from private sector power projects, 214 MW as contribution to Tamil Nadu grid by sale of electricity from captive generating plants, 2825 MW as Tamil Nadu's share from central generating stations and 305 MW as external assistance.

4.2 Generating capacity from privately owned wind farms is 4119 MW. The installed capacity of cogeneration in sugar mills is 466.10 (including 20 MW contributed from co-operative sugar mills) MW and biomass power project is 147.55 MW.

4.3 The average power availability during 2008-09 is around 8000 MW while the peak demand is around 9500 MW which leaves a deficit of around 1500 MW. Since the infirm wind generation contributes about 15% to 20% of the peak demand during wind season and TNEB has no standby capacity to take care of this infirm power fully, in case of unexpected meteorological changes, the deficit goes up to 2000 MW. This deficit is likely to increase in the next few years since the capacity addition is expected to be less than the projected increase in demand. Therefore, any addition in power generation will help the State to a great extent to tide over the shortage of power.

5. Applicability of this Order

Order No.3 dated 15-5-2006 of the Commission lays down a control period of three years for that order and therefore normally the next order should take effect from 15-5-2009 or thereafter. The Commission in the Common Order in M.P.Nos.9, 14 and 23 of 2008 dated 19-9-2008 has ruled that the control period of three years specified in order No.3 dated

15-5-2006 is waived from the date of issue of that order. The control period of three years, thus, stands terminated on 19-9-2008. Therefore, the Commission holds that all the bagasse based co-generation plant commissioned on or after 19-9-2008 shall become eligible for the benefits of the present order, subject to the condition that the monetary benefits shall accrue from the date of the present order. The existing agreements between the generators and the distribution licensee shall continue to be valid. The parties to the agreement are at liberty at any time to renegotiate the existing agreement mutually in accordance with the present order. The agreements between the generators and the distribution licensee in relation to all plants commissioned on or after 19-9-2008 shall be in conformity with this order.

6. Tariff Determination Process

6.1 With regard to tariff determination process, the relevant portion of Regulation 4 of the Power Procurement from New and Renewable Sources of Energy Regulation, 2008 are reproduced below:

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) *conducting public hearing on the above.*
d) *issuing general / specific tariff order for purchase of power from new and renewable sources based generators.*

6.2 The Commission in its order dated 19-09-2008, against the petitions M.P. Nos. 9, 14 & 23 of 2008 filed by Indian Wind Energy Association (InWEA) and others has ordered that “the prayer for revising the tariff for the NCES generators would be considered by the Commission separately”. In continuation of the above order, the Commission has issued this order.

7. Tariff / Pricing Methodology

(1) The relevant portion of Tariff / Pricing Methodology as specified in Regulation 4 of the Commission’s above said Regulation is

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 Electricity Regulatory Commission

(b) National Electricity Policy

(c) Tariff Policy issued by the Government of India

(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 Preferential tariff or by bidding process

7.1.1 At this juncture it is relevant to discuss the following stipulations of National Tariff Policy which are reproduced below:

Section 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.

Section 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.*

7.1.2 A view has been expressed by some stakeholders that competitive bidding process should be adopted for procurement of renewable, although the dominant opinion is in favour of continuing the present preferential tariff. The capital cost, variable cost and the cost of generation of renewable energy generators are still higher than coal based generation. It will take quite some time before renewable energy technology can compete with the conventional energy sources in terms of cost effectiveness. The Forum of Regulators, which is a body consisting of the Chairmen of all the State Electricity Regulatory Commissions and the Central Electricity Regulatory Commission considered this issue and has recommended that cost based tariff on reasonable norms should be permitted for renewable energy. The Commission endorses these recommendations of the Forum of Regulators and decides to continue the present system of preferential tariff.

7.2 Single Part vs. Two Part Tariff

In the Commission's order No.3 dated 15-05-2006, the Commission adopted the **"cost-plus, single-part, average tariff".** Two-part tariff is considered suitable, when fuel cost varies sharply. Variable component of tariff takes care of such escalation. Some stakeholders have recommended two-part tariff. The Commission decides to adopt cost-plus, two-part tariff.

7.3 Generalized tariff order

The generalized tariff mechanism ensures sufficient incentive to investors for adoption of the most efficient technology and thus maximize returns on the investment. Larger capacities are not anticipated in the co-generation sector and therefore, the Commission decides to adopt cost-plus, two-part, generalized tariff order.

8. Components of tariff

The following are the components of tariff for bagasse based co-generation:-

1 Capital investment
2 Plant Load Factor (PLF)
3 Debt-equity ratio
4 Term of the loan
5 Interest rate
6 Return on equity
7 Life of plant and machinery
8 Depreciation
9 Operation and maintenance expenditure
10 Insurance expenditure
11 Specific fuel consumption
12 Fuel Cost
13 Working Capital
14 Interest on Working Capital
15 Auxiliary Consumption

8.1. Capital Investment

8.1.1. Participants in the round table conference held on 16-7-2008 recommended a capital cost of Rs.4.30 crores / MW. They also stated that shift from water cooled condenser to air cooled condenser has hiked the capital cost by Rs.30 to 40 lakhs. The IREDA in their letter dated 26-12-2008 have furnished the bench mark for co-generation power projects for the boiler

configuration of 66 ata, 86 ata and 102 ata with capacities of 2500 TCD, 3500 TCD and 5000 TCD. The average of all the capacities works out to Rs.4.3 crores / MW. IREDA has stated that the actual cost of a project approved in Tamil Nadu during 2008-09 with a capacity of 23 MWs was Rs.114 crores, the average cost being Rs.4.96 crores / MW. The consultative paper circulated by the Commission proposed capital cost of Rs.4.96 crores / MW.

8.1.2. The IREDA, while commenting on the consultative paper, has informed the Commission by letter dated 9-2-2009 that the co-generation projects are being set up generally with boiler configuration of 87 ata or 110 ata and the corresponding benchmarked capital cost are in the range of Rs.4.33 crores / MW to Rs.5.00 crores / MW. The Ministry of New and Renewable Energy, Government of India, has suggested that the investment cost may be linked to escalation indices for major inputs such as steel and cement. TNEB recommends a capital cost of Rs.4.3 crores / MW on the ground that power evacuation cost has been excluded in the project cost. M/s. Rajshri Sugars has indicated that the capital cost of a project commissioned in January 2009 is Rs.5.00 crores / MW. The Southern India Sugar Mills Association has stated that the capital cost of projects currently under implementation is in the range of Rs.5.25 crores / MW.

8.1.3 CMD, IREDA stated in the Advisory Committee meeting that costing is very difficult as it varies with reference to boiler pressure, peripheral equipments, condensing equipments etc., Member, Accounts, TNEB opined that unless the cost is segregated between sugar industry and co-generation, it will not represent the correct cost. Thiru S.V. Balasubramaniam stated that sugar industry does not need high pressure boilers. Therefore, cost should not be apportioned. Further, due to shortage of water, air-cooled condensers are installed instead of water-cooled condensers. Additional cost is about Rs.40 to Rs.50 lakhs. There is no need to go into such minute details for fixing the capital cost. Dr.U. Shankar stated that the gain to sugar mills on account of co-generation should be taken into account. Thiru D. Kumaravelu felt that Rs.4.96 crores / MW is high and suggested Rs.4.00 crores / MW as capital cost. CMD, TEDA opined that Rs.5.00 crores / MW is on the high side and it needs to be

discounted by 10 to 15%. Thiru D.E. Ramakrishnan stated that co-generation is firm power. In a generalized tariff order, the impact of capital cost is negligible. Thiru S. Rathinavelu felt that there is a need to encourage setting up of new power projects on account of severe power shortage in Tamil Nadu. Thiru K.Raghu, special invitee opined that in a generalized tariff some investors may gain and some may lose. Thiru V.Thiagarajan, CMD, Thiruarooran Sugars recommended a capital cost of Rs.5.25 crores / MW. Thiru Sivasubramanian of Shakti Sugars represented that escalation of capital cost after 2006 has been high. He suggested a capital cost of Rs.4.5 crores / MW.

8.1.4. IREDA has been financing biomass and co-generation projects since 1987. They have financed projects with a total capacity of 809 MW at a cost of Rs.1533 cores out of which projects with a capacity of 677 MW have been commissioned. The Commission places reliance on the experience of this public sector financing agency and arrives at a figure of Rs.4.67 crores / MW which is the average of the figures suggested by IREDA in its letter dated 9-2-2009. This capital cost is apportioned among the three components, machinery, civil works and land at 85%, 10% and 5% respectively.

8.1.5. As regards the cost of evacuation raised by the TNEB in the context of capital cost, the Commission wishes to clarify that the capital cost of Rs.4.96 crores / MW mentioned in the concept paper did not include the cost of evacuation. Evacuation is dealt with in Clause 3 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 of the Commission. This Clause is in conformity with Sections 39 and 40 of the Electricity Act 2003.

8.2. Plant load factor

8.2.1.The plant load factor of a bagasse based co-generation depends on availability of fuel, mechanical efficiency of the plant, vintage of the plant, steam pressure, heat rate and calorific value of bagasse. The Commission adopted a plant load factor of 55% in Order No.3 dated 15-5-2006.

8.2.2 Ministry of New and Renewable Energy, Government of India has suggested that PLF may be fixed with reference to past achievement. TNEB has accepted a PLF of 55%. EID Parry and South India Sugar Mills Association, both, have pleaded that power generation resulting from capacity utilization in excess of 55% should be remuneratively priced. IREDA has suggested that co-generation power projects are normally expected to operate in the off-season also either with bagasse or other biomass fuels. Further, MNRE allows maximum upto 15% use of fossil fuels. It is all the more important to utilize the intrinsic capacity of co-generation plant with power generation during off-season also. Hence, consideration of 55% PLF for purpose of tariff appears to be on lower side.

8.2.3. Thiru T.B. Chickoba, former Member (Generation), TNEB and Member of the State Advisory Committee stated that capacity utilization of co-generation power plants has been low on account of inadequate supply of fuel from sugar factories, which is a seasonal industry. He suggested that coal should be permitted as an additional fuel to achieve higher capacity utilization. He also suggested derating of co-generation power plants at par with wind energy generators. Thiru S.V. Balasubramaniam, CMD, Bannari Amman Sugars Ltd. stated that sugar output has declined of late owing to poor quality of sugarcane. Sugarcane price has not been remunerative in the recent past because of which farmers have been shifting to other crops. Plant load factor varies from year to year. Dr.M. Abdullakhan analysed the figures of plant load factor furnished by TNEB and observed that the figures vary widely. He recommended that an average figure be adopted. Thiru V. Thiagarajan, CMD, Thiruarooran Sugars stated that variation in plant load factor is attributable to the fluctuating crop choices of farmers between sugarcane and other crops. He predicated that availability of bagasse for 2009-10 would be lower than 2008-09. He suggested that the Commission may adopt a block of five years for determination of plant load factor. He felt that the sale of power generated in excess of the PLF of 55% at ABT rates to the grid is not remenerative and does not even meet the variable cost. Thiru K. Raghunandan, MD, EID Parry Ltd. observed that an average PLF of 55% may be adopted for a period of five years. He suggested that the power generated in excess PLF of 55% should be saleable at the same rate instead of the ABT rates.

8.2.4 The TNEB in response to a query from the Commission has furnished the plant load factor of bagasse based co-generation power plants in their letter dated 26-2-2009. They have reported plant load factor ranging from 10% to 74% during 2006-07 and 13% to 63% during 2007-08. The plant load factor during 2008-09 (upto January 2009) has been reported in the range of 10% to 49%.

8.2.5 Considering the wide variation in the actual plant load factor reported by the TNEB during the three year period, the Commission decides to retain the figure at 55%.

8.3 Debt-Equity Ratio

The Tariff Policy lays down a debt equity ratio of 70: 30 for power projects. The Commission has adopted this ratio in the Tariff Regulations 2005 as well as in Order No.3 dated 15-5-2006. The Commission decides to retain the same ratio for this order.

8.4 Term of the Loan

The Commission fixed the tenure of term loan as 10 years with moratorium of one year in Order No.3 dated 15-5-2006 on the consideration that term loans sanctioned by IREDA stipulated this tenure. The Commission decides to retain the same tenure for this order.

8.5 Interest Rate

The IREDA which is a major financier of renewable energy projects has stated that interest rate of IREDA varies from 11.75% to 12.5%. In letter dated 09-02-2009, the IREDA has estimated the interest rate at 13% to 14% (or linked to PLR of SBI + 1%) and MNRE recommends accommodating the future rate variation. The TNEB considers that a rate of 9% to 10% should be adequate on the ground that the public financial institutions should offer concession for renewable energy generators. However, this has not happened and there is no preferential rate of interest for renewable energy generators. The Commission considers that interest rate of 12% is reasonable.

8.6 Return on equity

8.6.1. Order No.3 dated 15-5-2006 prescribes a return on equity of 16% pre tax, although Tariff Regulations 2005 of the Commission provides 14% post tax return for conventional power projects (which works out to 17.63% pre tax on the assumption that minimum alternate tax of 10.3 % is payable during the first ten years and corporate tax of 30.9% is payable during the remaining ten years). The treatment meted out to renewable energy projects is less favourable than conventional power projects. Therefore the Commission proposed to offer 14% post tax return for bagasse based co-generation projects equivalent to 17.63% pre tax. Subsequent to the preparation of the consultative paper the Central Electricity Regulatory Commission has notified a return of 15.5% post tax for tariff period commencing from 1-4-2009. The equivalent of 15.50% post tax would be 19.85% pre tax. The stakeholders have expressed opinion demanding post tax return of 16% and 15.5%.

8.6.2. The TNEB is not in favour of converting the post tax return to a pre tax return. Although there is limited validity in their plea, it will be difficult in practice to assess the actual tax liability of each and every individual generator. Therefore, it would be more practical to determine a pre tax return on equity, particularly in the case of small renewable energy generators. The concept of post tax return can be conveniently implemented in huge conventional power projects. Therefore, the Commission decides that 19.85% pre tax return on equity may be allowed for the bagasse based co-gen projects.

8.7. Life of Plant and Machinery

The Commission has considered a plant life of 20 years in the Order No.3 dated 15-5-2006. The Commission decides to retain the same life period for this order.

8.8 Depreciation

The concept paper proposed a depreciation rate of 7.84% per annum at par with the Order No.3 dated 15-05-2006 of the Commission. The Commission has adopted a depreciation rate of 4.5% per annum for wind energy generators in Order No.1 of 2009 dated 20-03-2009, assuming a life period of 20 years and residual value of 10%. The Commission adopts the same

rate of 4.5% per annum for bagasse based co-gen plants also. 85% of the capital cost shall be reckoned as the cost of the plant and machinery and therefore depreciation shall be calculated with reference to this value.

8.9 Operation and Maintenance Expenditure

Presently, operation and maintenance expenses are charged as a percentage of capital investment. The Commission would like to modify this practice to lay down that 85% of the capital investment, being the plant and machinery cost, may be reckoned as the basis for calculating O & M expenses. The present rate of 4.5% per annum is retained. Escalation of 5% may commence from the second year. With regard to maintenance of land & civil works, which constitutes 15% of capital investment, 0.9% of 15% may be allowed every year with annual escalation of 5%.

8.10 Insurance Expenditure

The Commission proposes to modify the existing procedure of computing insurance charges. Insurance charges will be computed with reference to 85% of the capital investment, which represents the cost of plant and machinery. The Commission proposes 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.

8.11. Specific fuel consumption

8.11.1. The Commission adopted specific fuel consumption of 1.60 kg / kwhr, station heat rate of 3700 kcal / kwhr and fuel calorific value of 2300 kcal / kg in Order No.3 dated 15-5-2006. The consultative paper proposed specific fuel consumption of 1.53 kg / kwhr, station heat rate of 3518 kcal / kwhr and fuel calorific value of 2300 kcal / kg.

8.11.2. IREDA has suggested that taking into account the losses during storage, handling, etc. specific fuel consumption may be in the range of 1.6 kg / kwhr. TNEB has suggested that the average consumption indicated in the project reports may be considered subject to a ceiling of 1.53 kg / kwhr. South India Sugar Mills Association suggests fuel calorific value of 2272 kcal /

kg, station heat rate in the range of 4000 kcal / kwhr and specific fuel consumption of 1.8 kg / kwhr.

8.11.3. Thiru S.V. Balasubramaniam, CMD, Bannari Amman Sugars Ltd. observed in the Advisory Committee Meeting that the station heat rate varies between 3900 kcal / kwhr to 4100 kcal / kwhr depending on moisture and the quality of sugarcane. The station heat rate figures quoted in the project reports should not be considered for tariff determination. Thiru M.R. Krishnan of Consumer Association of India recommended a competitive bidding for procurement of power. He felt that coal should not be allowed as an additional fuel for bagasse based co-generation power plants.

8.11.4. The Commission has adopted the heat rate of 3840 kcal / kwhr for biomass based power plants. As the technology is similar for biomass based power generation and bagasse based co-generation, the Commission decides to adopt the same station heat rate of 3840 kcal / kwhr. The fuel calorific value of bagasse is retained at 2300 kcal / kg. The resultant specific fuel consumption would be 1.67 kg / kwhr.

8.12. Fuel cost

8.12.1. Fuel cost is a key determinant of the cost of power in a cogeneration plant. The Commission adopted fuel cost of Rs.575 / MT in order No.3 dated 15-5-2006. The consultative paper proposed a fuel cost of Rs.1000 / MT with an escalation of 5% p.a. The Ministry of New and Renewable Energy, Government of India has suggested that Rs.200 / MT may be added towards the cost of loading, unloading, cutting and chipping. TNEB has suggested the fuel cost may be fixed below Rs.800 / MT. South India Sugar Mills Association suggests fuel cost of Rs.1958 / MT on the basis of a barter deal between certain sugar mills and Tamil Nadu Newsprints and Papers Ltd. Thiru A Vellaiyan, Member of the State Advisory Committee has quoted a deal of the Tamil Nadu Newsprints and Papers Ltd. to support a fuel cost of Rs.2000 / MT. Thiru S.V. Balasubramaniam, CMD of Bannari Amman Sugars wanted an extra Rs.250 / MT towards transport cost in addition to the price of fuel. Thiru T.B. Chikkoba and Thiru K. Venkatesan Members of the State Advisory Committee suggest a rate of Rs.1000 / MT with 5% escalation per annum. Tamil Nadu Cooperative Sugar Mills Federation in its letter dated 10-10-2008 addressed to Tamil Nadu Newsprints and

Papers Ltd. prescribed procurement rate of bagasse from the various cooperative sugar mills ranging from Rs.720 / MT to Rs.1040 / MT depending on quality and distance. . The weighted average rate indicated by the Tamil Nadu Cooperative Sugar Federation works out to Rs.923 / MT.

8.12.2. Taking into account the diverse figures, the Commission considers that a rate of Rs.1000 / MT with escalation of 5% per annum including the cost of transportation is reasonable.

8.13 Working Capital

The present order permits working capital of two months on account of fuel and two months for O & M expenses. The concept paper has proposed fuel stock for two months, O & M expenses for two months and receivables for one month. Revision of working capital for receivables is necessitated as a fact that the grace period permitted to the licensee for settlement of the dues is one month. TNEB has recommended O & M expenses for one month and fuel stock for one month. As the Commission proposes to provide one month working capital on account of receivables, it is sufficient to provide for one month working capital on account of fuel stock and O & M expenses.

8.14 Interest on Working Capital

The present order provides for an interest rate of 11% for working capital. The concept paper has suggested an interest rate of 12%. IREDA has recommended an interest rate of 13% to 14%. TNEB considers 11% interest as reasonable. The Commission believes that an interest rate of 12% is reasonable in the present context. The same rate has been adopted for term loan.

8.15 Auxiliary Consumption

The present order permits utilization of 9% of the generated power towards auxiliary consumption. The concept paper proposes to retain the rate of auxiliary consumption at 9%. IREDA has suggested a rate of 10%. TNEB accepts the 9% rate proposed in the concept paper. The Commission accepts the suggestions of IREDA and fixes the auxiliary consumption at 10%.

9. 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 incentive / disincentive
12 Metering
13 Evacuation of Bagasse based energy
14 Energy purchase agreement
15 Energy wheeling agreement
16 Renewable energy purchase obligation
17 Control period

9.1 Transmission and Wheeling Charges

Currently transmission and wheeling charges have been fixed at 3% for distances within 25 Kms and 6% beyond 25 Kms. The concept paper proposed to retain the same charges. Transmission and wheeling charges for wind energy has been fixed at 5% uniformly by the Commission in Order No.1 of 2009 dated 20-3-2009. The Commission wishes to prescribe the same uniform rate of 5% for bagasse based co-generators irrespective of distance. As regards consumption in LT services, the transmission and wheeling charges are fixed at 7.5% as in the case of wind generators.

9.2 Cross subsidy surcharge

At present order No.2 dated 15-5-2006 of the Commission prescribes the rates of cross subsidy surcharge. The rate varies from 97 paise to Rs.3.02 paise per unit depending on the category of the consumer and the voltage level. The State Electricity Regulatory Commissions of Maharashtra, Uttar Pradesh and Andhra Pradesh have done away with cross subsidy surcharge altogether. Gujarat State Electricity Regulatory Commission has exempted renewable energy sources from cross subsidy surcharge. The TNEB has chosen to relinquish temporarily, since November 2008, the cross subsidy surcharge leviable in terms of Order No.2 of the Commission. The TNEB has opposed preferential treatment for renewable energy generators in the matter of cross subsidy surcharge. The Commission believes that it is time for Tamil Nadu to make a beginning in this respect and therefore, the Commission decides to levy 50% of the cross subsidy surcharge for bagasse based co-generators.

9.3 CDM benefits

Undoubtedly, a promoter of bagasse based co-generation is required to put in lot of efforts to secure the benefits of Clean Development Mechanism and therefore, there is merit in the views of certain stakeholders that the entire credit should accrue to the promoter as it obtains now. Some State Commissions have permitted the distribution licensee to share 25% of the CDM benefits. The Forum of Regulators has considered this issue and have 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. The Commission accepts the formula recommended by the Forum of Regulators.

9.4 Reactive power charges

Indian Electricity Grid Code promulgated by the Central Electricity Regulatory Commission came into force on 1-4-2006. Clause 1.7 of the Code prescribes reactive energy charges of 5 paise / kvarh with effect from 1-4-2006 with an escalation of 0.25 paise / kvarh every year thereafter. The

present order stipulates reactive power charges at 6 paise / kvarh. The Commission wishes to adopt the Indian Electricity Grid Code and therefore prescribes 5.75 paise / kvarh as on 1-4-2009 and escalated by 0.25 paise / kvarh every year thereafter.

9.5 Grid Availability Charges

At present, the bagasse based co-gen power plants are being treated at par with fossil fuel based power plants for levy of grid availability charges, start up power, demand charges and energy charges as per Order No.2 dated 15-5-2006 of the Commission. The Commission proposes to retain the same charges for this Order also. As captive use of bagasse based co-gen power plants has been permitted for LT consumption in this Order, the Commission decides that LT consumers shall pay the tariff applicable to temporary supply in the case of outage of the generator. Similarly, the LT captive consumer shall pay to the licensee the appropriate tariff whenever the scheduled generation does not materialize or when consumption exceeds generation.

9.6 Adjustment of Energy Generated

9.6.1 Section 9 (2) of the Electricity Act 2003, confers on the captive generator the right to open access for the purpose of carrying electricity from the captive plant to the destination of his use. Therefore, a renewable energy generator shall be entitled to adjust the generated energy for captive consumption whether as a LT or a HT consumer. As regards sale to third parties, Clause 11 of the Intra State Open Access Regulations 2005 of the Commission, which prescribes a minimum limit of 1 MW, shall apply to renewable energy also.

9.6.2 Views have been expressed by some stakeholders against adjustment of captive generation for LT services. Acceptance of such a view would run counter to law and therefore, the Commission does not favour that view.

9.7 Scheduling and System Operation Charges

The scheduling and system operation charges have been prescribed in Order No.2 dated 15-5-2006 of the Commission. The prescribed charges are Rs.1000/day irrespective of capacity. With a view to incentivise renewable energy project, the Commission, by an amendment to Order No.2, prescribed charges of Rs.1000/day per 1.65 MW and above. For capacity less than 1.65 MW, proportionate charges were prescribed. This order shall continue to apply for bagasse based co-generators also.

9.8 Application fees and agreement fees

9.8.1. The Intra State Open Access Regulations 2005 of the Commission were amended in 2008 to provide for concessional application fees and agreement fees for generators of non conventional and renewable sources of energy. The application fees under the Energy Wheeling Agreement was fixed at Rs.200 / MW subject to a maximum of Rs.5000 and the agreement fees under Energy Wheeling Agreement was fixed at Rs.2000 / MW subject to a maximum of Rs.50000 on the consideration that generators of renewable sources of energy have small capacities compared to generators of conventional energy. The agreement fees for Energy Purchase Agreement have been fixed at Rs.2000 / MW or part thereof. As regards the Energy Purchase Agreement, the TNERC – Fees and Fines Regulations 2004 prescribes Rs.2000 / MW or part thereof as the fees for approval of Power Purchase Agreement by the Commission as against Rs.2500 / MW or part thereof leviable for conventional power plants. This fee shall be collected by the licensee and passed on to the Commission.

9.8.2 There is some validity in the plea of the TNEB that frequent changes in the usage of the renewable energy as well as the change of drawal point necessitate extra clerical work. Therefore, the Commission decides that every time a generator seeks such a change either through an amendment to an existing agreement or through a fresh agreement, an additional

charge equivalent to the application fees and agreement fees shall be leviable by the licensee on the generator.

9.9 Billing and payments

9.9.1 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. The distribution licensee shall make payment to the generator within 30 days of receipt of the bill. Any delayed payment beyond 30 days will attract interest at the rate of 1% per month.

9.9.2 If 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 simultaneously. While preparing the bill peak hour generation shall be adjusted against peak hour consumption. Off peak generation shall be adjusted against off peak consumption. Normal generation shall be adjusted against normal consumption. Peak hour generation and normal hour generation can be adjusted against lower slot consumption. Excess consumption will be charged at the tariff applicable to the consumer. Transmission and wheeling charges, scheduling and system operation charges and cross subsidy surcharge wherever applicable shall be recovered from the bill. The net amount recoverable from the consumer shall be raised in the bill.

9.10 Payment security and security deposit

9.10.1 The National Tariff Policy calls for adequate and bankable security arrangements to the generating companies. Order No.3 dated 15-5-2006 of the Commission stipulates a bankable security in favour of generator. This mechanism has been found impractical, as there is more number of generator and the monolith distribution licensee is unable to offer security for such numbers. Therefore, the Commission believes that penalty for delayed payment by the licensee would serve the ends of justice.

9.10.2 As regards the security deposit of the consumer, the Commission decides to retain the present arrangements. i.e., 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.

9.11 Power Factor incentive / disincentive

As per Clause 7.17 of the Tariff Order dated 15-3-2003 of the Commission, power factor incentive / 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 incentive / disincentive. On the same analogy, captive consumers of bagasse based co-generation shall be eligible for incentive or liable for disincentive based on the gross energy consumption and the applicable demand. This formula was adopted in Order No.3 dated 15-5-2006 and the Commission retains the same formula.

9.12 Metering

9.12.1 The Commission decides that metering and communication shall be in accordance with the following:

(1) Central Electricity Authority (Installation and Operation of Meters) Regulations 2006
(2) Tamil Nadu Electricity Distribution Code 2004
(3) Tamil Nadu Grid Code 2004
(4) Tamil Nadu Electricity Intra State Open Access Regulations 2005

9.12.2 Time of the day meter (ToD) / special energy meters shall be provided both at the generator end and consumer end, if open access is availed of. The consumers have been given the option to procure meters as specified in the Central Electricity Authority (Installation and Operation of meters) Regulations 2006.

9.13 Evacuation of Bagasse based Energy

9.13.1 Section 39(2)(c) of the Act states that the State Transmission Utility shall ensure development of an efficient, co-ordinated and economical system of intra State transmission lines for smooth flow of electricity from a generating station to the load centres. Section 40 of the Act stipulates that it shall be the duty of the transmission licensee to build, maintain and operate an

efficient, co-ordinated and economical system of intra State transmission and to provide non-discriminatory open access to its transmission system for use by any licensee or generating company on payment of the transmission charges or any consumer as and when such open access is provided by the State Commission under section 42(2) on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission. Section 42 of the Act states that it shall be the duty of the distribution licensee to develop and maintain an efficient, co-ordinated and economical distribution system in his area of supply.

9.13.2 The Forum of Regulators has recommended that grid connectivity should be provided by the transmission licensee / distribution licensees for renewable energy sources in an optimum manner, through their capital expenditure plans to be submitted to the appropriate Commissions for their approval. Clause 3 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 states as follows:

"Provided that, in the case of sale of entire power to the distribution licensee by any new and renewable source based generator, the cost of interfacing lines up to the interconnection point shall have to be borne only by the STU/ distribution licensee provided further that in case where the new and renewable source based generator referred to in the first proviso who has entered into an EPA with the distribution licensee referred to therein for the sale of entire power to the said distribution licensee decides to use such power agreed to be sold to the said distribution licensee, for his captive use or for sale of such power to a third person or to a distribution licensee other than the distribution licensee referred to above before the expiry of the period referred to in such EPA, then he shall be bound to reimburse the entire cost of interfacing lines to the distribution licensee with whom he has executed such EPA, before the wheeling of power to his captive use or sale to third person or distribution licensee other than the distribution licensee with whom the said EPA has been executed by him".

9.13.3 The TNEB submits that evacuation facility could be provided by them on priority basis, if they are permitted to collect infrastructural development charges. The Commission does not accept this plea because the Electricity Act 2003 makes it clear that it shall be the responsibility of the transmission utilities and the distribution licensee to create the appropriate

infrastructure. Therefore, the Commission prescribes the following procedure for creation of evacuation facilities.

(a) STU shall within 30 days of receipt of application from generators, intimate whether or not the long term access can be allowed without further system strengthening.

(b) If further system strengthening is essential, the results of study conducted by the STU based on the request of generators shall be intimated within ninety days of such request of generators

(c) Feasibility based on system studies shall be established within six months at the latest.

(d) Clearances, approvals, certificate, if any, required by generators shall be issued within a month time.

(e) The distribution licensee is not liable to pay compensation to the consumer on Open Access for deemed generation benefits in case the distribution licensee is unable to evacuate power due to failure of the Transmission and Distribution facility

9.13.4 The Commission decides that the cost of interfacing line upto the interconnection point shall have to be borne by the STU/Distribution Licensee in case of sale of entire power to Distribution Licensee by generators. For the captive use or sale of such power to third parties or to Distribution Licensee other than the Distribution Licensee of that area, the entire cost of inter facing line upto inter connection point shall have to be borne by the bagasse based co-generators and the work will be executed by the Distribution Licensee under Deposit Contribution Work basis. The STU/ Distribution Licensee shall have to maintain the standards as per CEA norms and Tamil Nadu Electricity Grid Code.

9.14 Energy purchase agreement (EPA)

The format of the Energy Purchase Agreement (EPA) shall be evolved by the Commission after discussion with bagasse based co-generators and the distribution licensee within a month of this order. The agreement shall be valid for a minimum period of 20 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.

9.15 Energy wheeling agreement (EWA)

The format of the Energy Wheeling Agreement (EWA) shall be evolved by the Commission within a month of the order after consultation with bagasse based co-generators and the distribution licensee. The agreement shall be valid for a minimum period of 5 years. The parties to the agreement shall be given the option to exit for violation of the agreement after serving a notice of three months on the other party. The plea of the TNEB for discontinuance of wheeling in case of default is taken care of by the relevant provisions in the Intra State Open Access Regulations 2005 of the Commission.

9.16 Renewable Energy Purchase Obligations (RPO)

9.16.1. Section 86(1) (e) enjoins upon the Commission to specify, for purchase of electricity from renewable sources of energy, a percentage of the total consumption of electricity in the area of a distribution licensee. The above statutory provisions is supplemented by Clause 6.4 of the National Tariff Policy which states that the Appropriate Commission shall fix a minimum percentage for purchase of energy from renewable energy sources, taking into account availability of such resources in the region and its impact on retail tariff. The Forum of Regulators (FOR) has recommended that renewable purchase obligation should be computed with reference to the energy input into the system and not the energy consumed.

9.16.2. As per the statistics furnished by the TNEB, the energy injected into the grid by the TNEB was 65085 MU for 2007-08. The Chief Electrical Inspector, Government of Tamil Nadu has reported that 2,570 MU were generated by standby generator sets during 2007-08. As it is not possible to estimate the energy generated by unorganized standby generators, it is sufficient to estimate the energy input on the basis of the above two figures, at 67,655 MU.

9.16.3. The energy injected by renewable sources of energy into the TNEB grid during 2007-08 was 7,615 MU. The

percentage of energy injected by the renewable energy sources works out to 11.26% of the total energy consumption in the area of the distribution licensee (7615 ÷ 67655). Excluding the energy generated by the standby generators, the percentage works out to 11.70 as against 11.26.

9.16.4. The Commission decides to fix the Renewable Energy Purchase Obligation at minimum of 13% for 2009-10 and minimum of 14% for 2010-11.

9.17 Control period

The Order No.3 dated 15-5-2006 of the Commission lays down a control period of three years. The determinants of tariff underwent radical changes during the control period. In pursuance of that effort the Commission consulted experts on 16-7-2008 and delivered an Order on 19-9-2008 in M.P. Nos. 9, 14 and 23 of 2008 scaling down the control period to two years. Clause 6 of the Power Procurement from New and Renewable Sources of Energy Regulations 2008 of the Commission promulgated on 8-2-2008 specifies that the control period may be ordinarily two years. Taking into account the views of the stakeholders, the Commission decides that the control period of this Order shall extend upto 31-3-2011.

10. Tariff

10.1. Tariff for the energy to be procured by the licensee from bagasse based co-generation power plants has been computed with reference to the determinants listed in para 8 of this Order. Tariff indicated in the table below is applicable for projects commissioned on or after 19-9-2008. Fixed cost has been tabulated for a period of 20 years. Variable cost has been furnished for 2009-10 and 2010-11.

Tariff for projects commissioned on or after 19-9-2008

fixed cost **variable cost**

Year of operation (nth year)	Fixed cost per unit (Rs / unit)
1st	2.520
2nd	2.543
3rd	2.476
4th	2.410
5th	2.346
6th	2.283
7th	2.221
8th	2.161
9th	2.103
10th	2.046

Year	Fixed cost per unit (Rs / unit)
11th	1.991
12th	1.938
13th	1.978
14th	2.020
15th	2.064
16th	2.111
17th	2.160
18th	2.211
19th	2.265
20th	2.321

Year	Variable cost per unit (Rs / unit)
2009-10	1.856
2010-11	1.948

The first year tariff is applicable for a period of one year from the date of commissioning, the second year tariff is applicable for one year thereafter and so on. As the control period expires on 31-3-2011, it is expected that the next tariff order would be in position by then.

10.2 The tariff applicable at any point of time would be the sum of the fixed cost for that year of operation and the variable cost applicable for the relevant financial year. For example, the tariff for a plant commissioned on 19-9-2008 would be Rs.3.15 / unit upto 5-5-2009 and Rs.4.376 / unit (Rs.2.520 + Rs.1.856) from 6-5-2009 upto 18-9-2009 because the project is eligible for financial benefit only from the date of this Order namely 6-5-2009. The tariff from 19-9-2009 upto 31-3-2010 would be Rs.4.399 / unit (Rs.2.543 + Rs.1.856) and from 1-4-2010 upto 18-9-2010 would be Rs.4.491 / unit (Rs.2.543 + Rs.1.948). A project commissioned on 10-4-2009 would have a tariff of Rs.3.15 / unit upto 5-5-2009, tariff of Rs.4.376 / unit (Rs.2.520 + Rs.1.856) from 6-5-2009 upto 31-3-2010 and a tariff of Rs.4.468 / unit (Rs.2.520 + Rs.1.948) from 1-4-2010 upto 9-4-2010. The tariff from 10-4-2010 upto 31-3-2011 would be Rs.4.491 / unit (Rs.2.543 + Rs.1.948) and from 1-4-2011 to 9-4-2011 would be the fixed cost of Rs.2.543 / unit

and the variable cost to be determined in the next tariff order. The illustrations are tabulated below:-

Date of Commissioning	Period	Fixed cost (Rs / unit)	variable cost (Rs / unit)	total cost (Rs / unit)
19-09-2008	19-09-2008 to 05-05-2009	-	-	3.15
	06-05-2009 to 18-09-2009	2.520	1.856	4.376
	19-09-2009 to 31-03-2010	2.543	1.856	4.399
	01-04-2010 to 18-09-2010	2.543	1.948	4.491
	19-09-2010 to 31-03-2011	2.476	1.948	4.424
	01-04-2011 onwards	2.476	to be notified in the next tariff order	-
10-04-2009	10-04-2009 to 05-05-2009	-	-	3.15
	06-05-2009 to 31-03-2010	2.520	1.856	4.376
	01.04.2010 to 09-04-2010	2.520	1.948	4.468
	10-04-2010 to 31-03-2011	2.543	1.948	4.491
	01-04-2011 onwards	2.543	to be notified in the next tariff order	-

Thus, fixed cost is computed for a period of one year from the date of commissioning, whereas in regard to variable cost, the figure relevant for that financial year is taken into account.

10.3. As regards the projects commissioned between 15-5-2006 and 18-9-2008, the tariff should be computed with reference to the following table.

Tariff for projects commissioned between 15-5-2006 and 18-9-2008

fixed cost **variable cost**

Year of operation (nth year)	Fixed cost per unit (Rs / unit)
1st	1.956
2nd	1.975
3rd	1.945
4th	1.916
5th	1.888
6th	1.861
7th	1.835
8th	1.810
9th	1.786
10th	1.764

Year	Fixed cost per unit (Rs / unit)
11th	1.743
12th	1.399

Year	Variable cost per unit (Rs / unit)
2009-10	1.856
2010-11	1.948

For example, a project commissioned on 18-9-2008 would have a tariff of Rs.3.15 / unit upto 5-5-2009 and tariff of Rs.3.812 / unit (Rs.1.956 + Rs.1.856) from 6-5-2009 upto 17-9-2009, a tariff of Rs.3.831 / unit (Rs.1.975 + Rs.1.856) from 18-9-2009 upto 31-3-2010 and tariff of Rs.3.923 / unit (Rs.1.975 + Rs.1.948) from 1-4-2010 upto 17-9-2010. Tariff from 18-9-2000 upto 31-3-2011 would be Rs.3.893 (Rs.1.945 + 1.948) and from 1-4-2011 onwards fixed cost would be Rs.1.945 and the variable cost as per the next tariff order. The illustration is tabulated below:-

Date of Commissioning	Period	fixed cost (Rs / unit)	variable cost (Rs / unit)	total cost (Rs / unit)
18-09-2008	18-09-2008 to 05-05-2009	-	-	3.15
	06-05-2009 to 17-09-2009	1.956	1.856	3.812
	18-09-2009 to 31-03-2010	1.975	1.856	3.831
	01-04-2010 to 17-09-2010	1.975	1.948	3.923
	18-09-2010 to 31-03-2011	1.945	1.948	3.893
	01-04-2011 to 17-09-2011	1.945	to be notified in the next tariff order	-

15-05-2006	15-05-2006 to 05-05-2009	-	-	3.15
	06-05-2009 to 14-05-2009	1.945	1.856	3.801
	15-05-2009 to 31-03-2010	1.916	1.856	3.772
	01-04-2010 to 14-05-2010	1.916	1.948	3.864
	15-05-2010 to 31-03-2011	1.888	1.948	3.836
	01-04-2011 onwards	1.888	to be notified in the next tariff order	-

10.4 As regards the energy generated beyond the plant load factor of 55%, the generator is deemed to have fully recovered the fixed cost. As bagasse based co-generation is feasible only upto the PLF of 55%, generation of energy in excess of that PLF should be deemed to be extraneous to co-generation. Such energy should be purchased by the licensee at the frequency linked rate applicable to the Unscheduled Interchange (UI) mechanism as prescribed in Order No.4 dated 15-5-2006 of the Commission.

11. Acknowledgement

The Commission acknowledges with gratitude the contribution of the officers and staff of the Commission, the valuable guidance provided by experts, the active participation and advice of the members of the State Advisory Committee and the pains taken by the members of the public in offering their suggestions. The Commission particularly is indebted to the valuable input of the Tamil Nadu Electricity Board, Tamil Nadu Energy Development Agency, Indian Renewable Energy Development Agency and the Ministry of New and Renewable Energy Sources, Government of India.

(R. Rajupandi)
Member

(B. Jeyaraman)
Member

(S. Kabilan)
Chairman

Annexure I

Draft Consultative Paper on Power Procurement by Distribution Licensee from Bagasse based Co-Generation Plants and allied issues relating to Captive Use and Third Party Sale

Annexure I

Draft Consultative Paper on Power Procurement by Distribution Licensee from Bagasse based Co-Generation Plants and allied issues relating to Captive Use and Third Party Sale

1.0 PREAMBLE

1.1 Power Scenario in Tamil Nadu

The TNEB's generating capacity as on **31.03.2008** is **10122.55** MW comprising **2970** MW from four Thermal Stations, **424** MW from four Gas Turbine Stations, **2187** MW from 33 Hydro Stations, **1180** MW from Private Sector Projects, **214** MW as contribution to Tamil Nadu grid by sale of electricity from Captive Generating Plants, **2825** MW as Tamil Nadu's share from Central Generating Stations, **305** MW as external assistance. Generating capacity from privately owned wind farms is **3839** MW and TNEB's wind farm capacity is **17.55** MW. The installed capacity of Cogeneration in sugar mills is **451.60** MW and of Biomass power project is **104.85** MW. The average generation during **2008-09** is around **8000 MW** while the peak demand is around **9500 MW** which leaves behind an **approximate deficit of around 1500 MW.** The infirm power generation contributes around 15 to 20 percent of the peak demand during wind season. As TNEB has no standby capacity to take care of this infirm power fully, in case of unexpected meteorological changes, the deficit shoots up to **2000 MW** during such times. This deficit is likely to increase in the next few years since the expected generation addition is found to be less than the projected increase in demand.

1.2 Importance of Non Conventional Energy Sources:

Global concern over pollution problems caused by the increase in green house gases emission and consequent climate changes have resulted in paradigm shift in the approach towards development of energy sector in all the countries. The need for adoption of clean technology, improving end use efficiency and diversifying energy bases etc., have all been seriously considered by the Government of India since the Sixth Five Year Plan, and the country is poised for a considerable increase in the use of renewable energy sources in its transition to a sustainable energy

base. Renewable energy sources such as wind, solar, mini hydro power, bio mass and bagasse based co-generation are abundant and they not only augment the energy generation, but also contribute to improvement in the environment, drought control, energy conservation, employment generation, upgrading of health and hygiene, social welfare, security of drinking water, increased agricultural yield and production of bio-fertilizers. The pace of development has been accelerated through fiscal and tax incentives.

Electricity Act 2003, National Electricity Policy, National Tariff Policy have all addressed the necessity for promotion of the co-generation and generation of electricity from renewable source of energy.

1.3 Commission's order on NCES based generation and allied Issues.

The Commission issued Order No. 3 dated 15.5.2006 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".** This order covered tariff rates for power procurement by the distribution licensee from Wind Energy Generators (WEGs), Biomass based generators and Bagasse based generators. In the said order the Commission decided to adopt **a control period of 3 years and therefore the next tariff revision is due from 15.5.2009.**

1.4 Representation of Generators

For the past one year, the generators have been representing that the capital cost, interest rates, maintenance cost, etc. have all considerably increased in the last two years and are repeatedly requesting the Commission to revise the tariff before the control period of three years taking into account the above escalation in input cost.

Considering all these factors while disposing of a petition by wind energy generators, the Commission relaxed the three years control period stipulated in order No.3 dated 15-05-2006.

In such a context, it has become necessary to revisit the order No.3 dated 15-05-2006. Order No.3 dated 15-05-2006 is a comprehensive one covering wind energy, biomass and bagasse based co-generation. It has now been decided to review each source separately.

Accordingly, this consultative paper addresses the "Power procurement by Distribution licensee from Bagasse based Co-generation plants and allied issues relating to captive use and third party sale."

2.0 Bagasse based Co-generation Power Scenario in Tamil Nadu

Tamil Nadu is blessed with conducive meteorological and topographical settings for electricity generation through Non conventional energy. The installed capacity Tamil Nadu is 446.10 MW as on **31-03-2008.** The year wise capacity addition in Tamil Nadu over the past 10 years is furnished below:

Year	capacity addition in MW
1997-98	131.60
1998-99	5.00
1999-00	-
2000-01	-
2001-02	-
2002-03	100.50
2003-04	32.00
2004-05	-
2005-06	40.00
2006-07	22.00
2007-08	120.50
Total as on 31.3.2008	**451.60**

3.0 Legal Provisions

3.1 Related Provisions of the Act:

(1) The Commission is guided by the following provisions of Section 61 of the Act which are relevant to this consultative paper:

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:

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 to this paper are reproduced below:

Section 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.

Section 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.

Section 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 National 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) Section 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) Section 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) Section 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) Section 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.*

3.4 Regulation on Non-Conventional Energy

In line with the provision of Electricity Act 2003, National Electricity Policy and National Tariff Policy the Commission notified the regulations on "Power Procurement from New and Renewable Sources of Energy Regulations, 2008 on 08-02-2008". The Regulations stipulate guidelines for fixing tariff and various issues relating to new and renewable sources of energy

4.0 Promotion of New and Renewable source of Energy and Tariff Determination Process

4.1. Promotion of new and renewable sources of energy

The minimum percentage of electrical energy which each distribution licensee shall purchase from new and renewable sources generators shall be as stipulated in the Commission's order issued from time to time, subject to the availability of such power.

In the Commission's order No. 3 dated 15.5.2006, the Commission fixed 10% as the minimum percentage of power each distribution licensee should purchase from NCES sources out of his total consumption in his area of supply. As per the statistics provided by TNEB for 2007-08 energy available for sale is 64430 MU out of which the contribution from NCES to the grid (for their own use and sale to TNEB) was 7507 MU. Assuming TNEB's purchase from NCES power as 35%, the purchase from NCES generators constitutes only 4.08% out of their total

consumption. Since the minimum purchase obligation is well within the limit specified by the Commission, it has been decided that the distribution licensee will continue to purchase the NCES power on preferential tariff as fixed by the Commission in line with section 6.4(2) of the National Tariff Policy.

4.2 Tariff Determination Process

With regard to tariff determination, the relevant portions of regulation 4 of the Power Procurement from New and Renewable Sources of Energy Regulation, 2008 are reproduced below:

(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;-

- *e) initiating the process of fixing the tariff either suo motu or on an application filed by the distribution licensee or by the generator.*
- *f) inviting public response on the suo motu proceedings or on the application filed by the distribution licensee or by the generator.*
- *g) conducting public hearing on the above.*
- *h) issuing general / specific tariff order for purchase of power from new and renewable sources based generators.*

Tariff petition has not been filed either by TNEB or by the generators. However, considering the importance of promoting the NCES power in the State, the Commission has initiated the process of determination of tariff for bagasse based co-generation power as provided in the regulation 4(1) of the above said regulation. Taking into consideration, the views from the experts in a round table conference held on 16-07-2008 **the Commission have prepared this consultative paper to invite public / stake holder's views on the proposed financial, operational and other related parameters / issues.**

5.0 Tariff / Pricing Methodology

The relevant portion of Tariff / Pricing Methodology as specified in regulation 4 is 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 cost plus single part average tariff which can be reviewed later.

5.1 Market Determined Pricing

In a free market, where there is perfect competition, market determines the price. But there is a shortage of power in the State and it is likely to continue for a few more years. There is a good reason that the market driven pricing mechanism may be difficult to apply in the case of renewable source of energy. Under market determined prices, the buyer of power would go in for merit-order dispatch and purchase power from the cheapest source. However, renewable power is comparatively a costlier source when compared to conventional sources of power. Adopting merit order dispatch may lead to renewable power not getting dispatched at all. The ABT mechanism provides for marginal price determination wherein the marginal price of power depends on the current frequency of the grid. These factors make market pricing of power purchase from renewable, difficult to implement.

5.2 Cost-Plus Tariff Determination

Cost-plus tariff determination is a more practicable method. It can be easily

designed to provide adequate return to the investor as assured return will lead to larger investment in renewable power.

5.3 Single Part vs. Two Part Tariff

In the Commission's order No. 3 dated 15-05-2006, the Commission adopted the **"cost plus single part average tariff".** Generally, the two part tariff is recommended when the fuel cost varies sharply. The variable component of tariff would take care of such price escalation.

During the Round table conference conducted on 16-07-2008, the experts expressed the view that the two part tariff is convenient to accommodate the fuel cost escalation.

6.0 Issues Relating to Energy Purchase:

6.1 Tariff Components

The above said regulation of the Commission 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 factors have been considered to arrive at the tariff for bagasse based co-generation.

- Capital investment
- Capacity Utilization Factor / Plant Load factor
- Debt-equity ratio
- Life of plant and salvage value
- Depreciation rate applicable
- Interest costs on debt (cost of loan / debt)
- Term of Loan
- Return on equity
- Operation and maintenance expenses
- Insurance Cost
- Fuel cost
- Power Evacuation Facilities
- CDM Benefits

The comments / suggestions provided in the round table conference of experts held on 16-07-2008 were also considered. The issue-wise comments / suggestions are discussed below.

6.1.1. Capital Investment :

The Commission assumed Rs.3.50 Crores / MW as the capital investment for Order No.3 dated 15-05-2006 for Order No. 3 dated 15.05.2006.

During the Round table conference conducted on 16-07-2008 the experts suggested that the capital cost may be adopted as Rs.4.30 Crores / MW as the cost of steel has gone up. They also expressed that the shift from water cooled condensers to Air cooled condensers has increased the cost by Rs. 30.00 to Rs. 40.00 lakhs.

The IREDA in its letter dated 26-12-2008 has furnished the bench marked rate varying from Rs.3.73 Crores / MW to Rs. 5.00 Crores / MW depending on boiler pressure and capacity. The average project cost works out to Rs.4.30 Crores / MW.

The Project cost approved for one of the co-generation developers in Tamil Nadu by IREDA during 2008-09 is Rs.4.96 Crores / MW.

Orders of other Commissions on Capital Investment :

Pariculars	Gujarat	Karnataka	Andhra	Haryana	UP
Date of Order	03-01-2007	18-01-2005	20-03-2004	15-05-2007	18-07-2005
Capital Cost (Rs. in Crores / MW))	4.00	3.00	3.25	3.95	3.50

It is proposed to adopt the average bench marked project cost or approved project cost for 2008-09 which ever is higher. Therefore, the Commission proposes the capital cost of Rs.4.96 Crores / MW.

6.1.2. Plant Load Factor:

The PLF adopted for the bagasse based co-generation plant in the present order dated 15-05-2006 is 55% considering the availability of bagasse in the crushing season.

During the Round table conference conducted on 16-07-2008 the experts expressed the view that the PLF depends on the availability of fuel and there is no problem in the availability of fuel for the current year but next year it may not be so. They requested to adopt block period basis instead of year to year.

Orders of other commissions on PLF

Particulars	Gujarat	Karnataka	Haryana	Andhra	UP
PLF (in %)	80	60	80	55	60

It is proposed to retain the existing rate of 55%. This assumption of PLF for fixed cost coverage is in line with the PLF adopted in the neighbour State Andhra Pradesh.

The TNEB is requested to furnish the PLF reached by the generators in last three years for consideration, while furnishing their comments on this consultative paper.

6.1.3. Debt - Equity Ratio :

Debt-equity ratio is mainly determined by IREDA / financial institutions. They have generally adopted debt-equity ratio of 70: 30 and as such ratio of 70: 30 is assumed. Other Commissions have adopted the same ratio.

6.1.4. Life of plant:

Generally the project life of a plant is considered as 20 years for tariff determination process.

Orders of other Commissions on life of Plant:

Particulars	Gujarat	Karnataka	Andhra
Life of the plant (in years)	20	20	20

Plant life of 20 years is considered as reasonable for tariff determination.

6.1.5. Depreciation:

Depreciation rate of 7.84% p.a on straight line method is proposed. The same rate has been adopted for independent power projects. A uniform rate of depreciation is proposed both for existing as well as new projects, at the rate of 7.84% per annum till the depreciation accumulates to 90% of the project cost.

Orders of other Commissions on Depreciation:

Particulars	Gujarat	Karnataka	Andhra
Depreciation (in %)	4.50	7.00	7.84

It is proposed to retain 7.84% for depreciation upto the accumulated value of 90% of the project cost.

6.1.6. Interest Costs on Debt (cost of loan / debt) :

As per the existing order, interest on debt allowed is 9%. During the Round table conference conducted on 16-07-2008, the experts opined that the rate of interest varies from 12% to 14% for a loan period of seven years with one year moratorium.

Orders of other Commissions on Interest Costs

Particulars	Gujarat	Karnataka	Andhra	UP
Interest on Loan (in %)	10.25	11	10	10

IREDA charges interest rate from 11.75% to 12.5%. The Commission proposes to adopt 12 % for tariff determination purpose. The investor may be allowed to avail cheaper loans, if available.

The term of loan may be extended upto 11 years including one year moratorium.

6.1.7. Return on Equity :

RoE presently allowed is 16% pre tax.

Orders of other Commissions on RoE

Particulars	Gujarat	Karnataka	Andhra	UP
RoE (in %)	14.00	16.00	16.00	16.00

The National Tariff Policy specifies that the rate of return should be such that it allows generation of reasonable surplus for growth of the sector. The above policy also specifies that the CERC would notify, from time to time, the rate of return on equity. Accordingly, the CERC has notified 14% post tax return on Equity. In line with the CERC's regulations the Commission's Tariff Regulations provides RoE of 14% post tax for conventional fuel based generating stations. The RoE 16% pre-tax

allowed to NCES Projects in the present order works out to 12.70% post-tax. With the objective of promoting renewable source of energy, the Commission proposes to adopt 14% post tax. The corresponding pre tax RoE would be 17.63% at the current rate of corporate income tax.

6.1.8. Operation and Maintenance Expenses

The Commission has allowed operation and maintenance expense of 4.5% for the first year on the capital cost with 5% escalation every year thereafter in the resent order.

During the Round table conference conducted on 16-07-2008 experts have suggested that operation and maintenance expenses should be indexed to inflation.

Orders of other Commissions on O & M Expenses

Particulars	Gujarat	Karnataka	Andhra	UP
Operation and Maint. Expenses	2.50% on capital cost with 5% escl	3% on capital cost with 5% escl	3% on capital cost with 4% escl	2.50% on capital cost with 4% escl

It is proposed to retain the existing rate of 4.5% with 5% escalation every year.

6.1.9. Insurance Cost

The Commission has allowed in the present order insurance at 0.75% of the project cost for the first five years. Thereafter; the above cost was reduced by 0.5% every year. The same formula would be retained now.

6.1.10. Working Capital

As per the existing order, the working capital is based on the following norms:

- Fuel stock – two months
- O & M Expenses – Two Months
- Interest on working capital -11%

Orders of Other Commissions on Working Capital

Particulars	Gujarat	Karnataka	Andhra	UP
Working Capital Components	Fuel stock – 1.5 months Receivables – 1/2 month O&M Expenses – one month			Receivables- two months

It is proposed to adopt the following norms with respect to working capital

- Fuel stock – two months
- O & M Expenses – Two Months
- Receivables – one months

Interest on working capital may be allowed at 12%

6.1.11. Specific fuel consumption

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

Orders of other Commissions on Fuel Consumption.

Particulars	Gujarat	Karnataka	Andhra	Haryana	UP
Specific Fuel Consumption (Kg/ kWh)	1.64	1.60	1.60	2.38	1.45

Considering the fact of available technology for the corresponding capital cost, the commission proposed the station heat rate of 3518 kcal / kWh and fuel calorific value of 2300 kcal / kg, which corresponds to a fuel consumption of 1.53 kg / kWh.

6.1.12. Fuel Cost:

During the Round table conference experts mentioned that the cost of bagasse has gone up from Rs.800-850/ MT to Rs.1050/MT. Next year it would be +20%. The cost cannot be revisited every time. They suggested adoption of a variable index to accommodate the cost increase instead of adopting adhoc percentage of escalation.

Orders of other Commissions on fuel cost

Particulars	Gujarat	Karnataka	Andhra	Haryana	UP
Fuel Cost (in Rs / MT)	775 with 5% escl.	800 with 5% escl	575 with 5% escl	900	740 with 4% escl

Taking into consideration, the above factors and increase in the price of bagasse, it is proposed to fix the fuel cost at Rs.1000/MT with 5% escalation p.a. during the control period.

If the finalization of next tariff order is delayed, the same escalation of 5% may be adopted during that period,

6.1.13. Auxiliary Consumption

The auxiliary consumption presently allowed is 9%.

Other Commissions order on Auxiliary Consumption

Particulars	Gujarat	Karnataka	Andhra	Haryana	UP
Auxiliary Consumption (in %)	8.00	8.00	9.00	10.00	8.50

Till such time these plants are properly audited and operated efficiently to minimize losses and maximize production as enunciated by the Energy Conservation Act, the auxiliary consumption may remain at 9%.

6.1.14. Evacuation Facilities:

It is the responsibility of the STU to have enough spare capacity in all the transmission corridors for free power flow and ensure maximum grid availability. The procedure for application and to obtain evacuation facilities is given below.

a. The interconnecting network up to the point of grid connection may be executed on DCW basis by the TNEB.
b. STU shall within 30 days of receipt of application from generators, intimate whether or not the long term open access can be allowed without further system strengthening.
c. If further system strengthening is essential, the results of study conducted by the STU based on the request of generators shall be intimated within ninety days of such request of generators.
d. Feasibility based on the system studies shall be established at the earliest possible but not later than six months.

e. Clearances, approvals, certificate, if any, required by generators shall be issued within a month time.
f. The cost of interfacing lines, switch gear, metering and protection arrangement shall have to be borne by the owner of generators, but the work will be executed by distribution licensee on Deposit Contribution Work basis.
g. When the owner of the generators happens to be a consumer and when the power fed to the distribution licensee grid is less than 2 MVA, dedicated line from the location of the generators to near by distribution licensee substation will not be required. The service line itself will cater to the need to export the power to the distribution licensee grid.
h. When the owner of the generators happens to be a consumer and when the power fed to the distribution licensee grid is more than 2 MVA, then a dedicated feeder to a nearby substation will be required. If already the consumer is availing himself of supply through a dedicated feeder and if the capacity of the feeder is adequate to carry the quantum of export of power, then the same feeder can be used for export of power and no additional installation is required.
i. In case the dedicated feeder is not adequate to carry the power exported, then the existing dedicated feeder has to be strengthened or a new line has to be erected.
j. For a non-consumer (user) the new interfacing line of appropriate capacity and voltage shall be at his cost and will be executed by distribution licensee.
k. No compensation shall be provided to the generators or the third party purchaser by the distribution licensee for deemed generation benefits in case the distribution licensee fails to evacuate power due to failure of the Transmission facility. However, the distribution licensee shall have to maintain the standards as per Commission's regulation on distribution standard of performance.
l. In case the generator decides to sell the entire energy to the licensee, the cost of evacuation facilities shall be borne by the licensee.
m. In case the generator opts for open access (either partly or fully) by terminating the EPA, the entire cost of evacuation already incurred by the licensee is to be reimbursed.

6.1.15. CDM Benefit:

The guide lines specified in the National Tariff Policy in this regard is reproduced below:

5.0 GENERAL APPROACH TO TARIFF

(i) Benefits under CDM

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.

It is proposed to share the CDM benefit in the following manner:

(i) If the generator decides to sell the entire energy to the licensee, the CDM benefit may be shared in the ratio of 50:20:30 between the generator, STU and the distribution licensee.

(ii) If the generator opts open access for captive use (adjustment against consumption), the CDM benefit may be shared in the ratio of 50:30:20 between the generator, STU and the distribution licensee.

(iii) If the generator opts for open access (third party sale), the CDM benefit may be shared in the ratio of 60:40 between the generator and the STU.

(iv) If the generator opts for partly open access and sell the balance energy to the licensee, the CDM benefit may be shared in the above proportion as in (ii) above.

6.1.16. Purchase Price

In Tamil Nadu, the purchase rate determined by the Commission is Rs.3.15/ unit.

During the Round table conference conducted on 16-07-2008 the experts felt that though Input cost has gone up sharply, tariff remains at Rs. 3.15/ unit because of linkage to the HT tariff. The tariff is subject to a ceiling of 90% of the HT tariff.

Orders of other commission on Purchase Price

Year	Gujarat (Rs / Unit)	Karnataka (Rs / Unit)	Andhra			Haryana (Rs / Unit)	UP		
			Fixed (Rs / Unit)	Variable (Rs / Unit)	Total Cost (Rs / Unit)		Fixed (Rs / Unit)	Variable (Rs / Unit)	Tc (Rs / Unit)
Date of Order	3/1/2007	18-01-2005	20-03-2004			15-05-2007	18-07-2005		
1	3.00 constant for 20 years	2.80 for first year and 2% escl. for the subsequent period of 9 years.	1.72	1.03	2.75	2.74 for first year and 2% escl. for further years	1.39	1.28	2.67
2			1.67	1.07	2.74		1.34	1.33	2.67
3			1.63	1.12	2.75		1.29	1.39	2.68
4			1.59	1.18	2.77		1.24	1.44	2.68
5			1.55	1.24	2.79		1.18	1.5	2.68
6			1.51				1.13		
7			1.47				1.08		
8			1.43				1.03		
9			1.35				0.98		
10			0.9				0.93		
11							0.53		

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

Year	**FCC (Rs/Unit)**	**VC (Rs/Unit)**	**Total cost (Rs/ Unit)**		**Year**	**FCC (Rs/Unit)**
1	3.120	1.681	4.802		11	2.616
2	3.149	1.765	4.915		12	2.100
3	3.083	1.854	4.937		13	1.719
4	3.019				14	1.770

5	2.956				15	1.824
6	2.895				16	1.880
7	2.835				17	1.940
8	2.777				18	2.002
9	2.721				19	2.068
10	2.667				20	2.136

The above proposed rate will be applicable for the project commissioned on or after issue of this order.

The Fixed capacity charges specified above will be continued for the entire agreement period of 20 years.

In order to consider the abnormal increase in the fuel cost, and to safeguard the existing agreements, the rate prescribed in the existing order dated 15-05-2006 has been segregated into two part tariff with the factors already prescribed. The fixed cost has been proposed based on the parameters in the existing order dated 15-05-2006 and the variable cost as per this consultative paper.

Tariff for existing projects may be as below from 15-05-2006

Year	Fixed cost (Rs / unit)	VC (Rs / Unit)	Total Cost (Rs / Unit)
1			3.15
2			3.15
3			3.15
4	1.916	1.681	3.597
5	1.888	1.765	3.653
6	1.861	1.854	3.715
7	1.835		
8	1.810		
9	1.786		
10	1.764		
11	1.743		
12	1.399		

6.1.17. Tariff Review Period/Control Period:

As per the existing order, the control period fixed by the Commission is three years. During the Round table conference conducted on 16-07-2008 the experts suggested that the control period may continue as three years with indexing formula for input escalation.

Orders of other commission on Control Period

Particulars	Gujarat	Karnataka	Andhra	Haryana
Control Period (in Years)	3	5	5	5

The Electricity Act 2003 has brought out far reaching changes in the Indian power sector. Radical changes have been introduced in the power sector, the impact of which is yet to be felt and studied even though 5 years passed. It is a transition period. At this stage, the Commission is of the opinion that it is not appropriate to bring out an order which has long term impact. As far as bagasse based co-generation is concerned, new technology with higher capacity and efficient generators are coming up. The interest rate on loan is in increasing trend. **Therefore, a short period of two years control period is considered prudent.**

6.1.18. Reactive Power Charges:

For bagasse based co-generators, the conditions and charges as provided in the Tamil Nadu Electricity Grid Code and the Commission's order on Transmission, wheeling and other charges will apply. At present the applicable reactive charges is 6 paise / KVArh.

Practice followed in other States on Reactive Power Charges

Particulars	Karnataka	Andhra	Maharastra	MP
Reactive Power Charges (in paise / KVArh)	40	10	25	27

The Commission feels that reactive power management is the responsibility of each and every user of the grid / electrical system. It is not enough to erect adequate capacitors. Maintenance of capacitors is also equally important and it should be done by every user of the network in the interest of stable grid and for maintenance of quality supply.

7.0 Issues Relating to Energy Purchase Agreement:

7.1. Energy Purchase Agreement

The generator shall sign an EPA with distribution licensee for a period of twenty years for sale of power. It is not intended that the Commission would approve EPA for each generator individually. The Commission has approved a model energy purchase agreement. The licensee may adopt the same.

The distribution licensee should sign the EPA within a month of submission of the application by the NCES generators.

The agreement period for power purchase may be maximum 20 years. The existing agreements between the distribution licensee and the generators shall be honoured. If the generator / licensee desires to terminate the agreement, they may terminate the agreement by serving three months notice to the other party.

7.2 Payment of Security for Power Purchase by Distribution licensee :

Section 6.2 of the Tariff Policy requires ensuring adequate and bankable payment security arrangements to the generating companies. On the same line Commission proposes that a bankable security in favour of the generator for an amount equivalent to an average monthly bill shall be opened by the distribution licensee, in case an EPA is signed for power purchase between distribution licensee and the generator.

8.0 Issues Relating to Energy Wheeling

8.1. Adjustment of Wheeled Energy

The Electricity Act 2003 does not contemplate any restrictions for self use of energy by a generator in regard to service category. Therefore, the generator can adjust the energy on unit-to-unit basis for self use in any HT service.

Regarding the captive usage for LT consumers, Commission accepts the difficulties expressed by TNEB. Further, since the LT services do not have ToD metering arrangement, it may not be possible to uniformly implement the various provisions

covered in this order. Therefore, it is decided to restrict the captive usage to HT services only.

The captive usage to HT services is permitted subject to the eligibility criteria of Electricity Rules 2005 issued by the Government of India

8.2. Peak & off Peak power, unit to unit adjustment:

As all the generators and the tied up users would be provided with TOD meters, the adjustment of energy shall be done on slot to slot basis within the monthly billing cycle as follows for bagasse based co-generation.

(i) Peak hour generation with peak hour consumption
(ii) Off-peak hour generation with off-peak hour consumption and
(iii) Normal hour generation with normal hour consumption.

It should be noted that units generated during a higher tariff ToD-slot could be consumed in a lower tariff ToD slot at the option of generators/users, but the reverse would not be allowed (i.e. units generated during a lower tariff ToD-slot cannot be drawn by the CGP Holder during a higher tariff ToD-slot). No carry over is allowed for the following month.

The peak hour extra charges and off peak hour rebate shall be on net energy consumption after deducting captive generation during the respective period.

8.3. Third Party Sale :

The present order permits third party sale subject to the regulations provided in open access regulations and provisions in Commission's order on transmission and wheeling charges.

During the Round table conference conducted on 16-07-2008 the experts opined that sale to PTC, Tata, Adani etc. may be permitted through inter state trading as allowed in Karnataka.

The rate of purchase of bagasse based co-generation power by the third party consumer is not within the purview of the Commission. Third party sale through the grid will be as specified by the Commission's regulation on Open Access and order on Transmission and other charges.

ToD / Special energy meters shall be installed by the generators as well as the third party consumers at the receiving end.

8.4. Transmission & Wheeling charges and line losses

Regarding the transmission and wheeling charges, the existing practice (which includes the line losses in kind in terms of energy) is given below:

Within 25 KM usage	3 %
Beyond 25 KM usage	6 %

Orders of other Commissions on Charges:

Particulars	Gujarat	Andhra	Maharastra	Haryana
Transmission & Wheeling charges	4% of the generated unit	50 paise / unit as network charge and 2.84% of energy	Transmission 5% and wheeling 2% (in energy terms)	Wheeling 2%

Total transmission and wheeling charges including transmission and distribution losses for various voltage levels of injection and drawal have been specified in the orders of the Commission on transmission and wheeling charges. As per that order, if the point of injection and point of drawal is at 33 KV level, the total transmission and wheeling charges will be very much less than 10%. To give encouragement for promotion of renewable energy, the Commission proposes to retain the existing charges which include the line losses in kind in terms of energy generated as below:

Within 25 KM usage	3 %
Beyond 25 KM usage	6 %

Those who avail open access for third party sale, the charges shall be levied as per the order of the Commission on transmission and wheeling charges.

8.5. Demand Charges / Grid Availability Charges:

The grid support / grid availability charges have been fixed by the Commission in its order on transmission and wheeling charges etc., wherein, the following conditions and the applicable charges for the same are specified. They are applicable for bagasse based co-generators.

1. Outage of generator conditions and providing start up power
2. When scheduled generation is not maintained and / or when the drawal by the consumer is in excess of the schedule.

a) Applicable Energy Charges: When the generator is synchronized with the Grid, energy charges shall be payable by the energy user, for the units supplied by the Distribution Licensee (i.e. balance units arrived at after subtracting the units supplied by the generator from the total consumption of the user during the billing month) at the applicable rate for that category. The time of day consumption (TOD) shall be charged for the net consumption only (deducting the generated energy from the energy consumed during the respective time slots).

b) Applicable Demand charges: In addition to energy charges stipulated above, the energy user shall pay applicable demand charges as below:

There are 2880 time blocks of 15 minutes interval in a billing month. It is not feasible to segregate precisely the quantum of demand supplied in each time block in the billing month to the energy user by the generator and by the licensee distinctly. This segregation may be computed by matching the demand recorded in each time block at the generator end (A) with the demand recorded in the corresponding time block at the energy users end (B) then

Case I: If (B) is lesser than (A), it means there is no supply of demand by the licensee to the energy user.

Case II: If (B) is greater than (A), it means that there is supply of demand by the licensee in that respective time block.

As per the tariff order dated 15-3-2003, a demand charge in a billing month by any HT consumer is 90% of sanctioned demand or recorded demand which ever is higher. As the demand is recorded at every 15 minutes time block, the recorded demand will show the maximum demand recorded in any of the 15 minutes time block in that billing period of one month.

The probability of occurrence of case I is zero and the probability of licensee supplying the demand in any one of the time blocks in a billing month as in case II is 100 percent. In such a scenario, whether the licensee is entitled to receive the demand charges in full, even though the generator is also injecting the demand into the grid continuously, needs to be addressed. It is no doubt that, all the fluctuation in the generator end and user end is met by the licensee. However, the percentage

of the demand, injected by generator is also to be taken for consideration and to that extent, the demand charges receivable by the Licensee is to be restricted.

Till a mechanism is put in place to ascertain the relation between the demand generated in each of the 2880 fifteen minutes time blocks and the demand recorded at the consumer end in the related time blocks, a reasonable approximation has to be followed to arrive at the demand supplied by the generator. The probability of meeting the demand of the user both by the generator and the licensee varies from 0 to 100 %. Therefore, it is considered prudent to convert the energy supplied by the generator into an equated demand with reasonable approximations as to be the deemed demand supplied by the generator to the user as specified in the order of the Commission on Transmission and wheeling charges.

8.6. Reactive Energy Charges :

As proposed in issue 6.1.18 in the provisions relating to energy purchase.

8.7. Banking:

As bagasse based co-generations is considered as firm power, banking provisions shall not apply.

8.8. Payment of Security Deposit:

The security deposit shall be equivalent to two times of the maximum of net energy supplied by the distribution licensee in a month in the preceding twelve months prior to April.

8.9. Billing and Payment to Bagasse based co-generators by Distribution licensee :

In case of captive use, the distribution licensee shall raise the bill after accounting for the net energy supplied at the end of each monthly billing cycle. Meter reading should be taken on the same day at bagasse based co-generator end and captive user / third party purchaser end. The generation at generator end shall be communicated to all the circles of the captive users / third party purchaser within two days so as to facilitate for matching generation with consumption in the same billing month. This adjustment will be done on slot to slot basis taking into account the (i) peak (ii) off peak and (iii) normal generation / consumption within monthly billing cycle. Excess generation in a monthly billing cycle can be sold to the Licensee at the rate fixed by the Commission. Excess drawal will be charged under respective

tariff applicable to the user. The distribution licensee shall raise the bill to the user after accounting for generation and consumption at the end of each monthly billing cycle subject to recovery of transmission and wheeling charges in kind.

In case of generators selling power to distribution licensee, the generator will raise the bill every month for the net energy supplied after adjusting the start up power, reactive power charges, etc as per this Order.

The payments to the generators in respect of the energy supplied shall be made by the distribution licensee within the same period as provided by the distribution licensee to recover payments from its HT industrial consumers.

8.10. Cross Subsidy Surcharge:

The present order of the Commission stipulates the same cross subsidy surcharges both for generation from conventional sources as well as renewable sources. Certain Commissions such as Maharastra, Gujarat, Karnataka have adopted a lower figure for generation from renewable sources. MERC has totally done away with cross subsidy surcharge for generation from renewable sources. The following tabulation indicates the situation.

State	Cross subsidy surcharge in rupees for generation from conventional	Cross subsidy surcharge in rupees for generation from renewable source
Maharastra	Nil	Nil
Gujarat	1.00 0.37 (draft order issued)	1.00 0.37 (draft order issued)
Uttar Pradesh	Nil	Nil
Andhra Pradesh	Nil	Nil
Karnataka	Nil	Nil

In order to promote generation from renewable energy sources, the Commission proposes to determine the cross subsidy surcharge at 50% of the level prescribed for generation from conventional energy sources.

8.11. Power factor incentive / disincentive

Power factor incentive / disincentive shall be levied as per the tariff order of the

Commission for the time being in force. Power factor incentive / disincentive is applicable to the consumer **as a percentage of current consumption charges**. In the same line, the pf incentive / disincentive is applicable to all the users on the current consumption charges bill prepared based on the gross energy and applicable demand as per this order. However, the average pf recorded by the meter will be the reference for calculation of pf incentive / disincentive

8.12. Energy Wheeling Agreement (EWA):

The generators / third party buyer of power and the concerned distribution licensee shall sign a EWA for the purpose of wheeling of power from the generators to the third party buyer. It is not intended that the Commission would approve EWA for each generator individually. The Commission has approved a model energy wheeling agreement. The licensee may adopt the same

The distribution licensee should execute the EWA within a month of submission of application by the generators or the third party buyer of power, as the case may be.

9.0 APPLICABILITY OF ORDER

This order after finalization will become operational from the date of its issue. This order would apply to all future contracts / agreements as well as renewal of existing contracts / agreements for the Bagasse based co-generation plants located within the State of Tamil Nadu. It should be noted that the existing contracts and agreements between the above type of generators and the distribution licensee signed prior to the date of issue of this order would continue to remain in force.

The generators and the licensees shall have the option to mutually re-negotiate the existing agreements / contracts, in line with this order including the rate for purchase in two parts applicable to that project, even before the expiry of the contracts.

Annexure II

COMMENTS OF THE STAKE HOLDERS ON THE CONSULTATIVE PAPER ON "POWER PROCUREMENT BY DISTRIBUTION LICENSEES FROM BAGASSE BASED CO-GENERATION PLANTS AND ALLIED OPEN ACCESS ISSUES"

Annexure II

COMMENTS OF THE STAKE HOLDERS ON THE CONSULTATIVE PAPER ON "POWER PROCUREMENT BY DISTRIBUTION LICENSEES FROM BAGASSE BASED CO-GENERATION PLANTS AND ALLIED OPEN ACCESS ISSUES"

I. Capital Cost

IREDA – The capital cost appears to be on higher side for boiler configuration of 66 ata. The benchmarked capital costs are in the range of Rs.4.33 Crs/MW to Rs.5.00 Crs / MW for boiler configuration of either 87 ata or 110 ata. Accordingly, the capital cost may be reconciled.

TNEB –The power evacuation cost has been excluded in the proposed capital cost. Hence, the cost of Rs.4.96 Crores/MW is considered to be high and a cost of Rs.4.30 Crores/MW may be adopted.

MNRE – may be linked to escalation indices for major input cost such as steel, cement, etc

Rajshree Sugars – The capital cost for the project commissioned in Jan'09 was Rs.5 Crs/MW and this may be included in the new category of plants.

SISMA – DPRs of some of the projects currently under implementation indicate that Rs.5.25 Crores per MW. Hence, the capital cost to be considered at Rs.5.25 Crores

II. PLF

MNRE – fixation may be based on the past achievements.

IREDA – Co-gen projects expected to operate in the off-season also. 15% use of fossil fuel allowed. Hence, the PLF considered as 55% appears to be on lower side

TNEB – 55% PLF is accepted

EID Parry – price for Generation over and above 55% may be enhanced in line with the present increase.

SISMA – PLF should be reckoned for a block of years, instead of on an annual basis so that surplus realization in respect of fixed cost in the years of sugar cane surplus will offset the shortfall in realization of fixed cost in the years of cane deficit. The excess power supplied over and above the 55% PLF should on an average be paid for at the variable cost or the ABT, whichever is higher.

III. Depreciation

TNEB – May be suitably altered based on the extended loan tenure of 15 years. Therefore, 6% p.a may be adopted

IV. Interest on Loan / Debt

IREDA – Interest rate may be considered at 13% - 14% (or linked to PLR of SBI +1%)

TNEB- Loan tenure may be extended to 15 years. With the efforts taken by RBI there is a downward trend in the rate of interest. Hence, the interest rate may be adopted at 9% to 10%

MNRE - interest rate variation for future requirement may be accommodated

V. Return on Equity (RoE)

MNRE – keeping in view the risk involved, higher rate may be fixed.

TNEB – May be considered at 14%. Any tax is to be borne by the generator.

SISMA – Corporate rate of IT is 33.99%, the pretax return would work out a figure of 21.21%. Hence, the basis of adopting a figure of 17.63% needs to be clarified.

VI. Working Capital and Interest on Working Capital

TNEB – Two months O & M is high one month may be considered. Fuel stock may be considered for one month. Interest may be considered at 11%.

IREDA – Interest rate may be considered at 13%-14% (or linked to PLR of SBI+2%)

VII. O & M Expenses

TNEB – 4.5% with 5% escalation including insurance may be considered.

SISMA – Tax on generation or consumption borne by the generator has to be considered while computing tariff.

VIII. Specific Fuel Consumption

TNEB – The average consumption indicated in the DPRs may be considered subject to a ceiling of 1.53 kg/kwhr.

IREDA – taking into account of losses during storage, handling etc., it may be in the range of 1.60 kg / kWhr

SISMA – Calorific value is only 2272 kcal / kg. The heat rate 3518 can be achievable only with steady fuel parameters in conventional fuel and the station heat rate achievable is in the range of 4000 + / - kcal / kwh. Hence, the fuel consumption of 1.80 kg / kwh may be adopted

IX. Fuel Cost

TNEB – It may be fixed below Rs.800 /MT

MNRE – minimum Rs.200/MT may be added towards the cost of freight, loading, unloading, cutting and chipping

SISMA – Recently, the Co-operative Sugar Mill Federation has finalized the tender for bagasse at Rs.1040/- MT ex-factory. The barter arrangement between some of the sugar mills and TNPL. In this instance, the value of bagasse works out to Rs.1958/- MT as under:-

- Landed cost of 5800 kcal/kg coal at sugar mill - Rs.5000/
- Equivalent value of Bagasse for 2272 kcal/kg – Rs.1958

X. Auxiliary Consumption

TNEB – 9% is accepted

IREDA – the auxiliary consumption is in the range of 10%

MNRE- about 1% may be added for cutting and chipping

EID Parry – The auxiliary consumption in Tamil Nadu is 9.50% to 10%

XI. CDM Benefit

TNEB – Passed on to the utility in proportion to the energy exported.

IREDA – normally available for projects with marginal viability and it is not the usual practice of sharing with the STU and distribution licensee and it is difficult to monitor.

MNRE – FOR suggestion may be adopted

SISMA – The costs are continuously incurred for auditing of the emission reductions on annual basis even after the project is commissioned. In view of the above, CDM benefit, if any, should accrue to the Project Developer only.

XII. Evacuation Facilities

TNEB – Restoration of earlier practice of carrying by Board on DCW basis may be considered

EID Parry - Termination of PPA on account of failure in payment by TNEB and Termination of agreement by TNEB the evacuation cost need not be reimbursed

XIII. Energy Purchase

TNEB – Already the Board is in stringent financial position. Hence, the proposed provision of opening bankable security may be dropped.

EID Parry – any default by the TNEB to pay the bills, the generator can terminate the agreement. In case any delay in payment, payment may be made with 2% over and above PLR for delayed period.

SISMA- The agreement period may be considered for 5 years. A clause may be incorporated providing for payment of interest at 18% p.a for payment delay.

XIV. Transmission & Wheeling Charges

TNEB – Cross subsidy surcharges should be 100%.

SISMA – Cross subsidy charges may be waived

XV. Applicability of Order

EID Parrys – The generator shall be permitted to enter into the execution of the EPA pending finalization of this order and this order shall become applicable as and when the

SISMA- It may be clarified as to how the fixed cost will be determined – whether it will be with reference to the current life of the plant eg., for a plant commissioned in 1996, whether fixed cost 14th year will considered while arriving at the applicable tariff

List of Persons / Organizations

1. Indian Renewable Energy Development Agency Limited
2. Ministry of New and Renewable Energy
3. South Indian Sugar Mills Association
4. M/s. Rajshree Sugars & Chemicals Limited
5. M/s. EID Parry (India) Limited
6. M/s. Tamil Nadu Newsprint and Paper Limited
7. Tamil Nadu Electricity Board

Annexure – III

PROCEEDINGS OF THE EXPERT COMMITTEE MEETING ON NON-CONVENTIONAL ENERGY SOURCES HELD ON 16-07-2008 (Bagasse based Co-generation Plants)

Annexure – III

Proceedings of the Expert Committee meeting on Non-Conventional Energy Sources held on 16-07-2008 (Bagasse based Co-generation Plants)

BIO MASS & CO-GENERATION

Mr.K.Raghunandan, MD, EID Parry India Ltd.

- Capital cost increased due to increase in steel & cement cost and due to inflation; the capital cost is around Rs.5.2 Cr/MW.
- Fuel cost is around Rs.1800 to Rs.2000 per tonne.
- Interest rate is 12.5%.
- Tariff shall be revised considering these escalated inputs

Mr.Ram V.Thiagarajan, CMD,M/s.Thiru Arooran Sugars Ltd.

- Capital cost is around Rs.5.2 Cr/MW.
- Interest rate is 13% to 14%
- Sugar cane cost increased to Rs.1050/tonne from Rs.800/tonne. Bagasse cost can be derived from it.
- Reapyment period is made shorter.

Mr.R.Murugesan, VP, M/s.Bannari Amman Sugars

- Tariff remains the same for the last 10 years.
- Transmission corridor is not available to sell the power to other States.

Mr.K. Raghu, MD, M/s.Ind Bharath

- All the textile mills shifted to Bagasse from Biomass fuel. Now the cost is more than Rs.2000 per tonne. Capital Cost is 5.2 to 5.5 Cr./MW.
- Give us one time exit from the PPA or give a better tariff.

Mr.Santhosh Kamat, Co-founder, M/s.Auromira Energy

- Fixed cost & variable cost increased to Rs.4.35
- Rs.5 Cr./MW to 5.50 Cr./MW capital cost is reasonable.
- Fuel cost gone upto Rs.2000 to 2500
- Give us one time exit from PPA.

Mr.S. BalaSubramanian, Director, Avante Garde Engineers & Consultants (P) Ltd.:

- Without modification of the sugar mill, it is not possible to go in for full fledged efficient cogeneration plant.
- That modification alone cost around 10 Crores for a 3500 TCD sugar mill.
- On the bagasse cost, the Commission has taken a view already that it should be compared with the pit head cost of coal which is agreeable. We should work out the latest figures on that. But it is more appropriate in Tamil Nadu that the cost of Lignite what is available in Neyveli can be considered.

Mr.S.C. Natu, Senior Vice President, MITCON, Pune:

- The cost of air cooled plant of one and half year old is Rs.5.3 Cr./MW. 5.5 Cr. per MW is reasonable.
- In Tamil Nadu, in the area around the sugar factory, the quality of power has improved to a great extent. Power for pumpsets has improved substantially. Next is the emission reduction benefits, such as environmental benefits, social benefits and sustainability benefits are not factorized in the tariff.
- Tamil Nadu has been a leading example, but of late they have skipped to the 2nd position or 3rd position.
- Technology has improved initially with 45 kg. pressure and has gone upto 67, 97 and 105 kgs. only because of efficiency improvement which saves more bagasse for the off season
- Financing cost has also gone up. Interest rates in 2005 for 1+10year at the rate of 8% to 10% has now become 1 + 6 years @ at the rate of 12% to 13%. Raw material cost has also increased by 8 to 10%. Maintenance, salary, etc. have also gone up by 40%.
- The promoters want to have a better RR (Rate of Return) 17, 18 to 20%. When the financial cost of implementation is around 5 to 6 Crs. / MW, the

repayment being (1 + 6) years at 13% interest, the reverse working gives a tariff of around Rs.4.50 and an escalation should also be provided.

- In a recent move of TNEB to set up cogen plants in seventeen co-operative sugar mills, the capital cost worked out as 4.5 to 5 Crores in March.
- Including sugar mill modification it works out to 5 to 6 Crs. / MW. If Tamil Nadu comes out with better tariff orders, taking into account the above parameters, another 600 MW could be added (today we are around 800 MW). Innovative actions by TNERC will help not only in Tamil Nadu but also other States.

Mr. Mohan Varghese Chunkath, CMD/TEDA:

- TEDA also did a small exercise in finding out the input cost for biomass units and we can confirm from that the price of Rs.1200 to Rs.1800 as indicated in the current market rate.
- The area which should be looked into is how to index the escalation that we find in the input costs. Unless the indexing is done, whatever increase is given, it may still become unviable at a future point of time. Capital Cost has increased quite considerably because of the steel cost, which is a major component.
- Chairman/TNERC requested TEDA to study and confirm the increase in different components of cost, which TEDA readily agreed.

Mr. Debashish Majumdhar, CMD/IREDA:

- Of late we have worked out a price, which has an index built in based on the rise in material cost. Therefore we had a benchmark cost fixed from time to time. Based on that we have worked out the cost more or less on the line mentioned by Mr. Natu.
- Interest rates are also fluctuating. Another important fact is that the banks and financial institutions are lending on floating rates which would be reset every year. This leads to a situation where project promoter has no idea as to what would be the real cost during the repayment.
- Even in IREDA, it was fixed rate of interest, as recently as 1 year back. We have revised it and we have interest rates every 3 years and we will now change it in line with bank with resetting every year.

- The current rate is about 12% which would go up. The market and SBI rate is around 13.5%. The feed stock on the biomass is increasing upto Rs.1800 per tonne.
- Biomass based power projects and cogen are distinctly different from other renewable sector. The other renewable sectors have no cost for fuel whether it is solar, wind or small hydro. Therefore there should be a built in variable / indexing for fuel cost escalation.

Mr.K.P. Sukumaran, Advisor, Cogen, MNRE:

- In the initial stages, the ERCs were very logical in giving a 14% return on post tax. But that situation no longer exists.
- When the Ministry indicated the guideline with price of Rs.2.25 / unit, we had built in escalation factor at 5%. Because of the unprecedented increase in commodity cost and other input cost, the Commission should also include an escalation factor into the tariff so that for certain period of time, the tariff remains logical.
- The Ministry supports the submission made by various groups and requests the Commission to look at it rationally and come out with a policy so that the entire renewable sector in Tamil Nadu comes up to the expected level.
- Another issue is the RPS issue, we had a 10% minimum. But a technology based RPS or an increased RPS by TNERC would also go in a long way for the development of more renewable source projects.

Mr.T.B. Chikkoba, Former Member, TNEB & SAC Member, TNERC:

- The Commission has fixed a control period for 3 years.
- But we find from their deliberations that the costs have gone up during 3 years and that they have to put up with a higher cost than what the Commission was reckoning.
- So the only way to correct this is to reduce the control period from 3 to 2 years so as to minimize this problem to the extent possible.
- With the increasing rise at fast rate, whether reduction of control period from 3 years to 2 years will solve the problem is a question.

- The principle is, once a tariff is fixed it should hold good for a period of 20 years or so as prescribed, should continue. Otherwise there is no point in fixing a tariff.
- In case of biomass and cogen, with the fuel cost going up, it will be reasonable to go in for two part tariff with fuel price adjusted for real cost every year. That way, there will not be a problem of fuel cost.
- The biomass plants should enter into a contract with their fuel suppliers so that escalation in the orders of 200% or 300% does not take place for so many years which binds them to supply for fixed years. We should develop the atmosphere of entering into contracts with everybody.
- The market fixes the rates. As planners, we should be judicious enough not to develop one industry where the industry cannot sustain the fuel. We have to take such an approach.
- My suggestion would be 3 years control period could be for the capital cost and have an annual formula for input escalation so that for biomass & cogen which are primarily dependent on fuel outside, the fuel cost could be provided annually by means of a formula. Member II informed that FSA may not be possible as it is from rural source.

Mr.K.Venkatesan, IAS (Retd.), SAC Member:

- Three years control period is ok for capital cost. But for other inputs we should have some variable factor.

List of participants:

1. Mr. E.V.R. Sastry, Senior Advisor, Centre for Energy Technology, Osmania University, Hyderabad
2. Mr.Debashish Majumdar, CMD, IREDA
3. Mr.T.C.Tripathi, Adviser, Solar, MNRE
4. Mr.C.R.Nagarajan, Tata BP Solar
5. M/s. Sri Power, Hyderabad
6. Mr. K.E. Raghunathan, M.D., SOLKAR Energy
7. Dr. M. Kumaravel, Professor, IIT, Chennai
8. Mr. Rajendra V.Kharul, Head, CWP, WISE, Pune
9. Mr. Mohan Varghese Chunkath, IAS, CMD, TEDA
10. Mr.C.S.Y.S. Rao, MD, Titan Energy Systems
11. Mr.R.Chellappan, M.D.,Numeric Power Systems
12. Mr. S. Kathiresan, Member(Accounts) /TNEB

13. Mr.T.K.Chikkoba, Former Member, TNEB & SAC Member, TNERC
14. Mr.K.Venkatesan, IAS (Retd), SAC Member
15. Mr.K.Raghunandan, MD, EID Parry India Ltd.
16. Mr.Ram V.Thiagarajan, CMD,M/s.Thiru Arooran Sugars Ltd.
17. Mr.R.Murugesan, VP, M/s.Bannari Amman Sugars
18. Mr.K. Raghu, MD, M/s.Ind Bharath
19. Mr.Santhosh Kamat, Co-founder, M/s.Auromira Energy
20. Mr.S. BalaSubramanian, Director, Avante Garde Engineers & Consultants (P) Ltd.
21. Mr.S.C. Natu, Senior Vice President, MITCON, Pune
22. Mr.K.P. Sukumaran, Advisor, Cogen, MNRE
23. Mr. Kasthuri Rangaiyan, VP, Indian Wind Power Association
24. Mr. A.H. Pandit, Consultant, IWEA
25. Mr. K. Venkatachalam, Chief Advisor, TNSMA
26. Mr.P.Vetrivelan, M/s. Sri Shanmugavel Mills
27. Mr.Jayachandran, M/s.Premier Mills, Coimbatore
28. Mr.Ramesh Kymal, M/s.Vestas
29. Mr. Ramani, M/s. Indian Wind Turbine Manufacturers Association

Annexure – IV

PROCEEDINGS OF THE SEVENTEENTH STATE ADVISORY COMMITTEE MEETING HELD ON 26-02-2009

Annexure – IV

PROCEEDINGS OF THE SEVENTEENTH STATE ADVISORY COMMITTEE MEETING HELD ON 26-02-2009.

Members Present:

1. Thiru. S.Kabilan	Chairman / TNERC
2. Thiru. B. Jeyaraman	Member / TNERC
3. Thiru. R.Rajupandi	Member / TNERC
4. Thiru.P.W.C.Davidar. I.A.S.	Secretary to Government Energy Department (I/c), Special Invitee
5. Thiru. Mohan Verghese Chunkath.I.A.S.	Member / SAC
6. Thiru. K.Venkatesan. I.A.S. (Retd)	Member / SAC
7. Thiru. T.B.Chikkoba	Member / SAC
8. Dr. M.Abdullah Khan	Member / SAC
9. Dr. U.Shankar	Member / SAC
10. Thiru. K.V. Shetty	Member / SAC
11. Thiru. D.Kumaravelu	Member / SAC
12. Thiru.S.V.Balasubramaniam	Member / SAC
13. Thiru. A.Vellayan	Member / SAC
14. Thiru. S.Rathinavelu	Member / SAC
15. Thiru. Vipin Jha.	Member / SAC
16. Thiru. D.E.Ramakrishnan	Member / SAC
17. Thiru. K.P.Sukumaran	Special Invitee
18. Thiru Debashish Majumdar	Special Invitee
19. Thiru. S.Kathiresan	Special Invitee
20. Thiru K.Raghu	Special Invitee

i) The meeting commenced with welcome address by Chairman, TNERC. The Chairman, TNERC stated that 17th SAC meeting is a continuation of the last SAC meeting held on 16-06-2009. The subjects of establishment of evacuation

facility particularly tie lines, where it was left in the last meeting was taken up. It was indicated that the cost of tie lines can be borne by the generator or by the TNEB and in either case it is recovered through tariff from consumers. However, as the assets are in the books of TNEB, it is not logical to account the same in the books of the generators. Chairman highlighted the importance of NCES and that the Hon'ble Minister for Electricity in his speech on the floor of the State Legislature has also expressed the same. Subsequently, Chairman requested the SAC members to offer their views on issue basis on the subject.

This was followed by a presentation by the Deputy Director / Tariff on Bagasse based Co-generation and the issue wise discussion was taken up:

Issue 1: Capital Cost

Chairman / TNERC: TNERC's proposal of Rs.4.96 Crores / MW is based on the project cost approved by IREDA in 2008-09.

Thiru. T.B.Chikkoba: Marginal cost for generation of power is to be taken to fix the capital cost and not the entire cost.

Thiru S.V.Balasubramaniam: Sugar production does not need the high pressure boilers. Therefore, cost should not be apportioned. Further, due to shortage of water, air cooled condensers are installed instead of water cooled condensers. The additional cost works out to Rs. 40 to Rs. 50 lakhs. We need not go into such details for fixing the capital cost.

Dr.U.Shankar: Financial Gain to sugar mills because of establishment of co-gen is to be taken into account.

Thiru D.Kumaravelu: 66 ata boiler etc are for co-gen only. However, Rs.4.96 Crores/ MW is on the high side. Rs.4.00 Crores / MW is reasonable based on the rate adopted in Gujarat State.

Thiru. Mohan Verghese Chunkath: Rs.5.00 Crores / MW is on the high side. This may be discounted by 10 to 15%.

Thiru Debashish Majumdar: Costing is very difficult as it varies with reference to boiler pressure, peripheral equipments, condensing equipments etc.

Thiru DE.Ramakrishnan: Co-gen is a firm power and there is severe shortage of power in the State. There is no need for meticulous accounting of minute details as it is a generalized tariff and the impact is negligible.

Thiru S.Kathiresan: Unless the cost is segregated between sugar industry and co-gen, it will not represent the correct cost.

Thiru.S.Rathinavelu: There is a severe shortage of power in Tamil Nadu. Karnataka tariff is much liberal. Now it is right time to encourage industries for setting power projects.

Thiru. K.Raghu: It is a generalized tariff. Some may gain and others may lose. Therefore, the capital cost shall not be curtailed.

Issue 2. Plant Load Factor

Chairman/TNERC, read out a statement received from the TNEB regarding the PLF achieved by various plants.

Thiru. T.B.Chikkoba: Low PLF is due to inadequate fuel as sugar factory is a seasonal industry. Therefore, allow coal etc, to attain higher PLF in national interest. De-rating as allowed to wind may be allowed here for co-gen also.

Thiru S.V.Balasubramaniam: Production of sugar factory has come down due to low quality of sugar cane. Sugar cane price is comparatively less. Therefore, there is a shift to other crops by the farmers. PLF is different in different years.

Dr. M.Abdullah Khan: As seen from the figures furnished by TNEB, variability between different years for PLF is high. Therefore, average is to be fixed appropriately.

Thiru Debashish Majumdar: Due to seasonal nature of sugar industry, the PLF is less for co-gen. Even though MNRE restricts use of conventional fuel, they shall be allowed to use coal etc, to reach higher PLF. Otherwise, it is a national waste.

Member II / TNERC: As per order No.3 dated 15-05-2006, for the generation over and above 55% PLF, they are paid at the rates applicable to fossil fuel co-gen rate which has a floor and ceiling rate.

Issue 3. Depreciation

Thiru. S.Kathiresan: Depreciation rate shall be 6% by enhancing the loan tenure to 15 years.

Chairman / TNERC: We have to go by the prevailing market condition.

Issue 4. Return on Equity (RoE)

Thiru. K.Raghu: Higher percentage of RoE may be allowed, since PLF achieved is much less. Tax holiday is available for power industry only and therefore, co-gen may not have the benefit of tax holiday. Hence, the percentage of RoE may be increased appropriately.

Thiru. S.Kathiresan: As this a personal taxation, it shall be borne by the generator and the RoE may be 14%.

Thiru. DE.Ramakrishnan: Since the benefit of tax holiday is not there for co-gen and if the income tax is paid by themselves, to that extent the effective rate of RoE will come down. This is to be necessarily addressed.

Chairman / TNERC: This percentage is specified for power producing industrial activity and for them the RoE will match with income tax.

Issue 5 Interest on Loan:

Thiru. S.Kathiresan: Loan tenure may be extended to 15 years. With the efforts taken by RBI there is a downward trend in the rate of interest. Hence, the interest rate may be adopted at 9% to 10%

Issue 6. Working Capital:

Thiru DE.Ramakarihnan: Receivable may be for two months instead of one month

Thiru A.Vellayan: Actual practice for working capital norms are O&M two months, fuel two months and receivable two months.

Thiru S.Kathiresan: Two months O & M is high, one month may be considered. Fuel stock may be considered for one month. Interest may be considered at 11%.

Issue 7. Operation and Maintenance Expenses

Thiru D.Kumaravelu: Insurance shall be allowed within O & M and 4.5% is in the high side. 4% including insurance is reasonable.

Thiru S.Kathiresan: 4.5% with 5% escalation including insurance may be considered.

Member II / TNERC: While O & M will increase over the period and insurance will decrease over the period. Hence it cannot be combined.

Thiru T.B.Chikkoba: 0.75% for insurance shall be for equipment cost and not on project cost.

Thiru K.Raghu: 4% for O & M including insurance is not sufficient for smaller configuration plants.

Thiru S.V.Balasubramaniam: The present rate of 4.5% for O & M and 0.75% for insurance may continue and need not be reduced.

Thiru K.Venkatesan: As the impact is very meager, this may be continued

Issue 8. Specific Fuel Consumption

Thiru S.Kathiresan:The average consumption indicated in the DPRs may be considered subject to a ceiling of 1.53 kg/kwhr.

Thiru S.V.Balasubramaniam: Due to quality of sugar cane, moisture etc, station heat rate is different which may be 4000 +/- 100 kcal / kwh. What is given in the DPR is not to be taken as it is not the actual.

Issue 9. Fuel Cost

Thiru A.Vellayan: TNPL pays Rs. 2000/-MT; this may be taken into account.

Thiru S.V.Balasubramaniam: The price paid to Co-op. Sugar Mills is Rs.1040/-. To arrive at the delivery cost, transport cost of Rs.250/- MT is to be added.

Thiru S.Kathiresan: As per the order of other Commissions, the fuel prices are in the range of Rs.800 to 900 per MT.

Chairman / TNERC: Other Commissions prices relate to much earlier periods. As per the price paid by TNPL to 14 Co-op Sugar Mills, the Commission has arrived the weighted Average price of Rs.923-/MT. The price arrived seems reasonable.

Thiru T.B.Chikkoba and Thiru. K.Venkatesan: Rs 1000/MT with 5% escalation per annum seems to be reasonable

After the discussion on Bagasse based Co-generation, another presentation was made by the Deputy Director / Tariff on the details of discussion on Biomass based generation of power, and the details of discussion on the subject are as below:

Issue 1: Capital Cost

Chairman / TNERC: TNERC proposal of Rs.5.10 Crores / MW is based on the project cost approved IREDA in 2008-09

Thiru. K.Raghu: Cost of Air cooled condensers is to be included in the proposed capital cost.

Thiru S.Kathiresan: The power evacuation cost has been excluded in the proposed capital cost. Hence, the cost of Rs.5.10 Crores/MW is considered to be high and a cost of Rs.4.65 Crores/MW as per IREDA approval may be adopted.

Thiru D.Kumaravelu: TNEB stand of Rs.4.65 Cr. /MW is reasonable.

Issue 2. Plant Load Factor

Chairman/TNERC, read out a statement received from the TNEB regarding the PLF achieved by various Biomass plants.

Thiru.K.Raghu: Cost of raw material has gone up from Rs.750/MT to Rs.2250/MT. With the present tariff even the variable cost cannot be recovered. There is a shift in the usage of Biomass by Co-gen., Textile Industry etc.

Thiru. Mohan Verghese Chunkath: Seasonal power is also infirm. If good tariff is given more and more Biomass plants will come up.

Thiru. T.B.Chikkoba: There is scarcity of fuel. Fuel is not available even if good tariff is given.

Thiru S.V.Balasubramaniam: Cost is prohibitive compared to tariff. We had an idea to put up a Biomass Plant and we deferred the same on scarcity for fuel availability and cost.

Thiru Debashish Majumdar: Un-organized biomass is still available as per study conducted on this. Suddenly it has competitive uses and since tariff is not much they cannot even survive. Sugar Industry has a command area but not for Biomass.

Issue 3. Specific Fuel Consumption:

Thiru S.Kathiresan: The average consumption indicated in the DPRs may be considered subject to a ceiling of 1.10 kg/kwhr.

Thiru. K.Raghu: The Commission may take up the IREDA view points as they have the experience as financiers for the past several years.

Dr. M.Abdullah Khan: Actual data from various plants are to be collected and a decision must be taken.

Issue 4. Fuel Cost

Thiru T.B.Chikkoba: It may be fixed at Rs.2000/MT and they may also be given exit option.

Member II / TNERC: All power purchase agreements were already executed without exit clause. The Commission cannot do anything in a bilateral agreement.

Thiru S.Kathiresan: As per the order of the other Commissions, the fuel prices are in the order of Rs.1000/MT.

Thiru K.Raghu: We are ready to hand over the plants to TNEB and they may run the plant at this cost.

Issue 4. Auxiliary Consumption

Thiru K.Venkatesan: The Commission may ask the generators to furnish the data

Thiru K.Raghu: Minimum auxiliary consumption of 10 to 10.5% is reasonable. Maintenance of data is very tough and costly. Because different raw materials with different moistures are used. Further it involves cost for testing of samples.

Thiru S.Kathiresan: If the increase is beyond 9%, it must be based on the data.

Chairman/TNERC, in his concluding remarks, thanked all the members for their valuable suggestions.

Annexure – V

PROCEEDINGS OF THE PUBLIC HEARING HELD ON 5TH MARCH 2009

Annexure – V

PROCEEDINGS OF THE PUBLIC HEARING HELD ON 5TH MARCH 2009

Secretary, TNERC welcomed all the participants gathered for public hearing and requested to offer their views on the consultative papers for determination of tariff for wind Energy, Bio-Mass and bagasse based Cogeneration power.

Thiru.V.Raghu, Secretary General, M/s.Indian Wind Power Association.

Requested the Commission to set the following parameters for determination of wind tariff.

CUF 23 % ; Capital Cost – Rs.6.00 cr./MW ; O&M Expenses – 1.80% for 2 years with 5% escalation per annum ; Insurance - 0.75% on replacement value with 5% escalation thereafter; Interest – 13% ; ROE – 15.5 % (post tax) as per CERC norms ; tariff rate of Rs.3.90 per unit with annual escalation of 9 paise per unit. The tariff rate for group 1 and group 2 WEGs should also be revised on the principles of equality before law. The actual de-rating for the WEGs is around 7% in the last 3 – 4 years. The O&M charges has increased to 21 paise per unit and requested to follow the Maharashtra model of wind tariff determination.

If Commission imposes sharing of CDM benefits with the licensee, the promoter will not get any CDM benefits. No cross subsidy surcharge for wheeling to third parties be levied; RPO should be at 15% ; Rebate for payment made within 15 days shall be as in Gujarat ; BPSC for payment made over 15 days shall be charged at SBI PLR ; permission for outside State sale be given ; Demand charges may be calculated based on the actual generation units only; adjustment of higher TOD slot units against lower TOD be allowed ; no scheduling and system operation charges be levied ; Permission for availing banked units during R & C period in addition to the TNEB quota shall be given. The lapsed units shall be sold to TNEB or permission must be given to carry over the lapsed units to the forthcoming years without any time restrictions. Prior discussion with generators is required for finalizing model EPA/EWA .

Thiru.K.Venkatachalam, Chief Adviser to Tamil Nadu Spinning Mills Association.

Requested the Commission to set the following parameters for determination of wind tariff.

CUF – 22%; Capital Cost – Rs.5.45 cr./MW ; The actual O&M cost is around 1.89%. Commission may consider 1.69% of capital cost as O&M with the escalation prevailing in the market. Loan tenure may be fixed at 7 years with one year moratorium period. Interest on loan may be fixed at 13.5 %. The projects will get CDM benefits only if there is any viability gap. Hence, there shall not be any sharing of CDM benefits and it may be given to the Generators in full. The tariff for group1, group2 and proposed tariff may be fixed at Rs.3/- , Rs.3.20/- and Rs.3.40 respectively.

Thiru.Ajit Pandit appeared for M/s.Indian Wind Energy Association, M/s.Simran wind power and M/s Super wind Power.

The Control period of 2 year and the ROE of 17.63% specified in the consultative paper is agreeable. For the RPO there is no maximum limit mentioned in NTP, trajectory kind of target may be fixed. Regarding CUF, the wind potential sites are already exploited and 26.5% may be considered. Regarding capital cost, indexation with respect to steel and cement price movement may be introduced as introduced by Rajasthan ERC in their MYT order. The project may be exposed for 10 years MAT and 10 years corporate tax. The interest on debt shall be based on PLR movement. Time value of money may be considered. The Cross subsidy Surcharge should be made nil since the cross subsidy surcharge formula introduced in the National Tariff Policy does not include the NCES sources. Control period was waived on 19-09-2008, the new order should have retrospective effect from that date otherwise there will be Regulatory vacuum for the intermediate period.

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars.

As PLF variability is there due to switching over of crops by farmers, availability of bagasse, etc. The availability of bagasse for the year 2009-10 will be lower than the availability in the year 2008-09. Commission may consider a block of

5 years for PLF calculation. Any variation may be adjured in the next year PLF requirement. Due to lower achievable PLF, the promoters could not take back their fixed cost. Generation over 55% PLF, such sale is paid at ABT rates which may be less than even the variable cost ; The actual calorific value of the bagasse is only 2272 Kcal/Kg due to higher moisture content and hence, the actual station heat rate comes to 4000 k.cal./kwh. Cross subsidy surcharge may be waived. Capital cost shall be Rs.5.25 cr./MW. Payment to the promoters shall be paid within 30 days and any delayed payment over 30 days, interest at 18% per annum shall be paid to the promoter. Generator alone may avail the entire CDM benefits. The matter of levying taxes on generation and consumption is under litigation and the same may be accommodated in the tariff order. Commission may permit to use coal in the off season so that the promoters can get the variable cost of coal along with the fixed cost.

Thiru K.Raghunathan, MD, EID (P) ltd.

PLF must be bankable and adjustment may be done every year. An average of 55% PLF over a period of 5 years block may be considered by the Commission. Power from higher PLF shall be given the same rate. For the units generated using bagasse, even if the PLF is beyond 55 %, NCES tariff may be permitted instead of ABT rates. Cane crushing data furnished to the Government may be verified for fuel quantity for achieving 55% PLF. As various administrative expenses are involved in getting the CDM benefits, it may be permitted to be held by the Generators.

Thiru N. Ramani, Indian Wind Turbine Manufacturers Association.

The 3 years control period should be reduced from the date it was announced. The effective date for the new tariff should be either from 15th May, 2008 or 19th September, 2008. 15.5% post tax should be considered for ROE as prescribed by CERC. Incentives for better performing projects. Removal of cross subsidy payment for wheeling to third parties, determination of project specific pricing for large projects; allowing of 100% CDM benefits to generators atleast for 2 years; Payment by Letter of Credit and exit clause should be introduced to attract international developers. IDC should not be included in the project cost. If TNEB is charging evacuation charging, the wind tariff should not be Rs.3.40 per unit. Wind potential is not same in all areas.

Thiru K.Venkatesh, M/s.Rajshree Sugars, Coimbatore

The proposed order may be applicable from 15-05-2008. The projects commissioned prior to the proposed order and after the end of the control period should be treated as new projects for the purpose of fixing new tariff order.

Thiru S.Gandhi, President, Power Engineers Society of India.

Only 6 days are given for preparation of public hearing and the Tamil version of the consultative paper have not been posted in the Commission's website. Wind power is infirm in nature and not facilitating TNEB, TNEB consolidate all kind of power and distribute. Regarding capital cost, it is on higher side and no evidence for fixing the capital cost is given. Cost of the WEG can not be more than 2 crores/ MW. WEGs are getting central subsidy and corporate tax benefits and hence there is no reason to fix a RoE of 17.63%. Electricity Act, 2003 does not permit banking and hence banking arrangement should not be given to the WEGs. TNEB has not made any study on the impact of TNEB grid due to 4200 MW WEGs because they are all inductive in nature. As per Europian standards the fault level in each feeder can not be more than 5%. But due to WEGs, the fault level is more. In the state of Kerala the tie feeders with the WEGs are directly connected to the bus bar of the substation. But in Tamil Nadu it is not so. There should be heavy penalty mechanism for VAR component injected into the grid. CUF should be arrived based on the machines commissioned in the last 3 years. The actual CUF in Theni area is around 37.5%. IDC should be charged with the promoters or the promoters themselves can lay the transmission line. No justification in waiving the cross subsidy and the poor people will get affected. Due to WEGs 36,000 acres of land is barren and there is no agricultural production in these lands. Consultative paper reflects the policy of privatizing the profits and socialize the losses.

Thiru Siva Subramanian, Sakthi Sugars:-

Very few plants came up after 15-05-2006. Two plants were commissioned in 2007 & 2008. Escalation of expenditures after 2006 is high. We achieved less than 55% PLF in the past. For the existing projects capital cost may be revised to Rs.4.5 crores/MW and the tariff may be reworked accordingly. We have spent around Rs.5.5 crores for evacuation and this amount may be included in the capital

cost. RoE of 15.5% post tax may be given as prescribed by CERC. This should translate into 20.771% pre-tax. TNEB is purchasing power at Rs.9 per unit and the co-generators are ready to supply at less than Rs.9 per unit.

Thiru R.Varadarajan, DGM, DCW Ltd.

The old projects should be included in the new tariff regime and the promoters are not getting payment from TNEB in time.

Thiru A.Senthilkumar, M/s.TANFAC India Ltd.

We have captive power plant based on waste heat recovery from chemical process. The tariff fixed by TNERC is only Rs.3.15 per unit. Since ours is a co-generation plant, this should be treated on par with the bio-mass power plant. We are not able to make agreement with TNEB for sale of electricity since our consumption is less than 51%.

Thiru N.Nagarajan, DGM(O&M), M/s.Subashree Bio energies (P) Ltd.

We have biological biomass production and the plant is classified under biomass group. The capital cost is around Rs.11 crores per MW and the generation cost is Rs.10.50 per unit. The demand charges imposed should be waived. Charges may be levied under Tariff – I instead of Traiff – III in the case of drawal from TNEB.

Dr.Rajapandian, Professor, Panimalar Engineering College.

If there is more demand for the wind machines, cost will come down. The WEGs shall be allowed to realize the market price and should be allowed to sell any body.

Thiru K.Periasamy, Director (Technical), M/s.Precision Equipments (P) Ltd.

Bio-mass should not be encouraged as it affects the fertility of the top soil and agriculture productivity. Pumped storage power plant may be categorized under NCES as it reduces the peak load. Solar power plant can be encouraged only in the villages where standalone system is required. NCES sources shall be encouraged only when it is economically viable. Power Plants with de-salination shall also comes under NCES.

Thiru K.Nagaraju, M/s.Lakshmi Electrical Control System Ltd.,

Surplus units can be carry over to the next year to those people who have not signed agreement with TNEB. Adjustment of peak hour units to other slots should be allowed due to power cut.

Thiru M.P.Vasanth.

The date of commissioning is not relevant since previously it was a single part tariff, but the proposed tariff is two part tariff and therefore the applicability is to be clearly spelt out. Agreement period is 20 years but the tariff is calculated based on the 12 years.

Thiru M.R.Krishnan, Consumrs Association of India.

The time given by the Commission for public hearing is not sufficient for preparing the notes. Competitive bidding in procurement should be introduced. Commission can review the performances of service providers. Most of the assumptions in the consultative paper is based on the better parts of the other Commission reports. Using of Coal should not be allowed in bagasse based generation.

Thiru V.Mageswaran, Unorganised workers federation

Consumer burden should be reduced. Solar and wind energy should be promoted under public sector projects. Land is affected due to wind energy project.

Thiru K.Vijayarajan, Director, M/s.ABI Energy Consultancy Service (P) Ltd.

It is only after the year 2000, few projects have been registered for CDM benefits. Only the projects which requires financial additionality have been considered for CDM benefits. The transaction cost for getting CDM benefits is about 5 to 25% of the CERs.

Thiru S.V.Angappan, GS, TNEB Accounts & Executive staff union.

There is no evidence for the capital cost fixed by the Commission. TNEB does not have the capacity to buy the costly power. Tariff should be revised so that TNEB will have sufficient RoE. Banking shall be left to the decision between distribution licensee and WEGs.

Thiru T.R.Krishnasamy, Director, Energreen Power Ltd.

The capital cost of biomass gasification plant is high which is about Rs.7.5 crores / MW. This should be bench marked . The cost of engine itself is more than Rs.3.5 crores/MW. Commission should provide some incentive to encourage technological advancements. Evacuation shall be provided at 100 KW level in villages.

Thiru Yuvaraj, Tamil Nadu Farmers Sangam, Kumbakonam,

Supply is not available even for 6 hours a day for agriculture purpose in last month in Tanjore area. At least 8 hours supply should be given to the agriculture sector. Farmers are not getting higher rate for bagasse. WEGs may be encouraged.

List of Persons/Organization

1. Thiru.V.Raghu, Secretary General, M/s.Indian Wind Power Association.
2. Thiru.K.Venkatachalam, Chief Adviser to Tamil Nadu Spinning Mills Association.
3. Thiru.Ajit Pandit appeared for M/s.Indian Wind Energy Association, M/s.Simran wind power and M/s Super wind Power.
4. Thiru V.Thiagarajan, CMD, Thiruarooran Sugars.
5. Thiru K.Raghunathan, MD, EID (P) ltd.
6. Thiru N. Ramani, Indian Wind Turbine Manufacturers Association.
7. Thiru K.Venkatesh, M/s.Rajshree Sugars, Coimbatore
8. Thiru S.Gandhi, President, Power Engineers Society of India.
9. Thiru Siva Subramanian, Sakthi Sugars
10. Thiru R.Varadarajan, DGM, DCW Ltd.
11. Thiru A.Senthilkumar, M/s.TANFAC India Ltd.
12. Thiru N.Nagarajan, DGM(O&M), M/s.Subashree Bio energies (P) Ltd.
13. Dr.Rajapandian, Professor, Panimalar Engineering College.
14. Thiru K.Periasamy, Director (Technical), M/s.Precision Equipments (P) Ltd.
15. Thiru K.Nagaraju, M/s.Lakshmi Electrical Control System Ltd.
16. Thiru M.P.Vasanth.
17. Thiru M.R.Krishnan, Consumrs Association of India.
18. Thiru V.Mageswaran, Unorganised workers federation
19. Thiru K.Vijayarajan, Director, M/s.ABI Energy Consultancy Service (P) Ltd.
20. Thiru S.V.Angappan, GS, TNEB Accounts & Executive staff union.
21. Thiru T.R.Krishnasamy, Director, Energreen Power Ltd.
22. Thiru Yuvaraj, Tamil Nadu Farmers Sangam, Kumbakonam,

Annexure-VI

SUMMARY OF COMMENTS RECEIVED FROM THE STAKE HOLDERS, ADVISORY COMMITTEE MEMBERS AND PUBLIC ON THE CONSULTATIVE PAPER CIRCULATED BY THE COMMISSION.

Annexure-VI

SUMMARY OF COMMENTS RECEIVED FROM THE STAKE HOLDERS, ADVISORY COMMITTEE MEMBERS AND PUBLIC ON THE CONSULTATIVE PAPER CIRCULATED BY THE COMMISSION.

1. CAPITAL COST

IREDA – The capital cost appears to be on higher side for boiler configuration of 66 ata. The benchmarked capital costs are in the range of Rs.4.33 Crs/MW to Rs.5.00 Crs / MW for boiler configuration of either 87 ata or 110 ata. Accordingly, the capital cost may be reconciled.

Thiru Debashish Majumdar: Costing is very difficult as it varies with reference to boiler pressure, peripheral equipments, condensing equipments etc.

TNEB –The power evacuation cost has been excluded in the proposed capital cost. Hence, the cost of Rs.4.96 Crores/MW is considered to be high and a cost of Rs.4.30 Crores/MW may be adopted.

Thiru S.Kathiresan: Unless the cost is segregated between sugar industry and co-gen, it will not represent the correct cost.

MNRE – may be linked to escalation indices for major input cost such as steel, cement, etc

Rajshree Sugars – The capital cost for the project commissioned in Jan'09 was Rs.5 Crs/MW and this may be included in the new category of plants.

SISMA – DPRs of some of the projects currently under implementation indicate that Rs.5.25 Crores per MW. Hence, the capital cost to be considered at Rs.5.25 Crores.

Thiru. T.B.Chikkoba: Marginal cost of generation of power is to be taken and not the entire cost.

Thiru S.V.Balasubramaniam: Sugar factory does not need the high pressure boilers. Therefore, cost should not be apportioned. Further, due to shortage of water, air cooled condensers are installed instead of water cooled condensers. The additional cost which is Rs. 40 to Rs. 50 lakhs. We need not go into such minute details for fixing the capital cost.

Dr.U.Shankar: Gain to sugar mills because of establishment of co-gen is to be taken into account.

Thiru D.Kumaravelu: 66 ata boilers etc are for co-gen only. However, Rs.4.96 Crores/ MW is on the high side. Rs.4.00 Crores / MW is reasonable based on the rate adopted in Gujarat State.

Thiru. Mohan Verghese Chunkath: Rs.5.00 Crores / MW is on the high side. This may be discounted by 10 to 15%.

Thiru D.E.Ramakrishnan: Co-gen is a firm power and there is sever shortage of power in the State. There is no need for meticulous accounting of minute details as it is a generalized tariff and the impact is negligible.

Thiru.S.Rathinavelu: There is a sever shortage of power in Tamil Nadu. Karanataka tariff is much liberal. Now it is right time to encourage industries for setting power projects.

Thiru. K.Raghu: It is a generalized tariff: Some one may gain and other may lose. Therefore, the capital cost shall not be curtailed.

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: Capital cost shall be Rs.5.25 cr. /MW.

Thiru Siva Subramanian, Sakthi Sugars: Escalation of expenditures after 2006 is high. We achieved less than 55% PLF in the past. For the existing projects capital cost may be revised to Rs.4.5 crores/MW and the tariff may be reworked accordingly

2. PLANT LOAD FACTOR

MNRE – fixation may be based on the past achievements.

IREDA – Co-gen projects expected to operate in the off-season also. 15% use of fossil fuel allowed. Hence, the PLF considered as 55% appears to be on lower side

Thiru Debashish Majumdar: Due to seasonal nature of sugar industry, the PLF is less for co-gen. Even though MNRE restriction is there for use of conventional fuel, they shall be allowed to use coal etc, to reach higher PLF. Otherwise, it is a national waste.

TNEB – 55% PLF is accepted

EID Parry – price for Generation over and above 55% may be enhanced in line with the present increase.

SISMA – PLF should be reckoned for a block of years, instead of on an annual basis so that surplus realization in respect of fixed cost in the years of cane surplus will offset the shortfall in realization of fixed cost in the years of cane deficit. The excess power supplied over and above the 55% PLF should on an average be paid for at the variable cost or the ABT, whichever is higher.

Thiru. T.B.Chikkoba: Low PLF is due to inadequate fuel as sugar factory is a seasonal industry. Therefore, allow coal etc, to attain higher PLF in national interest. De-rating as allowed to wind may be allowed here for co-gen also.

Thiru S.V.Balasubramaniam: Production of sugar factory has come down due to low quality of sugar cane. Sugar cane price is comparatively less. Therefore, there is shift to other crops by the farmers. PLF is different in different years.

Dr. M.Abdullah Khan: As seen from the figures furnished by TNEB, variability between different years for PLF is high. Therefore, average is to be fixed appropriately.

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: As PLF variability is there due to switching over of crops by farmers, availability of baggase, etc. The availability of baggase for the year 2009-10 will be lower than the availability in the year 2008-09. Commission may consider a block of 5 years for PLF calculation. Due to lower achievable PLF, the promoters could not take back their fixed cost. Generation over 55% PLF, such sale is paid at ABT rates which may be less than even the variable cost;

Thiru K.Raghunathan, MD, EID (P) ltd: PLF must be bankable and adjustment may be done every year. An average of 55% PLF over a period of 5 years may be considered by the Commission. Power from higher PLF shall be given the same rate. For the units generated using bagasse, even if the PLF is beyond 55 %, NCES tariff may be permitted instead of ABT rates

Thiru Siva Subramanian, Sakthi Sugars: Escalation of expenditures after 2006 is high. We achieved less than 55% PLF in the past. For the

existing projects capital cost may be revised to Rs.4.5 crores/MW and the tariff may be reworked accordingly

3. **Depreciation**

TNEB – May be suitably altered based on the extended loan tenure of 15 years. Therefore, 6% p.a may be adopted.

4. **Interest on Loan / Debt**

IREDA – Interest rate may be considered at 13% - 14% (or linked to PLR of SBI +1%)

TNEB- Loan tenure may be extended to 15 years. With the efforts taken by RBI there is a downward trend in the rate of interest. Hence, the interest rate may be adopted at 9% to 10%.

MNRE - interest rate variation for future requirement may be accommodated

5. **Return on Equity (RoE)**

MNRE – keeping in view the risk involved, higher rate may be fixed.

TNEB – May be considered at 14%. Any tax is to be borne by the generator.

SISMA – Corporate rate of IT is 33.99%, the pretax return would work out a figure of 21.21%. Hence, the basis of adopting a figure of 17.63% needs to be clarified.

Thiru. K.Raghu: Higher percentage of RoE may be allowed, since PLF achieved is much less. Tax holiday is available for power industry only and therefore, co-gen may not have the benefit of tax holiday. Hence, the percentage of RoE may be increased appropriately.

Thiru. D.E.Ramakrishnan: Since the benefit of tax holiday is not there for co-gen and if the income tax is paid by themselves, to that extent the effective rate of RoE will come down. This is to be necessarily addressed.

Thiru Siva Subramanian, Sakthi Sugars: RoE of 15.5% post tax may be given as prescribed by CERC. TNEB is purchasing power at Rs.9 per unit and the co-generators are ready to supply at less than Rs.9 per unit.

Thiru S.V.Angappan, GS, TNEB Accounts & Executive staff union: There is no evidence for the capital cost fixed by the Commission. TNEB does

not have the capacity to buy the costly power. Tariff should be revised so that TNEB will have sufficient RoE.

6. Working Capital and Interest on Working Capital

TNEB – Two months O & M is high one month may be considered. Fuel stock may be considered for one month. Interest may be considered at 11%.

IREDA – Interest rate may be considered at 13%-14% (or linked to PLR of SBI+2%)

Thiru D.E.Ramakarihnan: Receivable may be for two months instead of one month

Thiru A.Vellayan: Actual practice for working capital norms are O&M two months, Fuel two months and receivable two months.

7. O & M Expenses

TNEB – 4.5% with 5% escalation including insurance may be considered.

SISMA – Tax on generation or consumption borne by the generator has to be considered while computing tariff.

Thiru D.Kumaravelu: Insurance shall be allowed within O & M and 4.5% is in the high side. 4% including insurance is reasonable.

Thiru T.B.Chikkoba: 0.75% for insurance shall be for equipment cost and not on project cost.

Thiru K.Raghu: 4% for O & M including insurance is not sufficient for smaller configuration plants.

Thiru S.V.Balasubramaniam: The present rate of 4.5% for O & M and 0.75% for insurance may continue and need not be reduced.

Thiru K.Venkatesan: As the impact is very meager, this may be continued

8. Specific Fuel Consumption

TNEB – The average consumption indicated in the DPRs may be considered subject to a ceiling of 1.53 kg/kwhr.

IREDA – taking into account of losses during storage, handling etc., it may be in the range of 1.60 kg / kWhr

SISMA – Calorific value is only 2272 kcal / kg. The heat rate 3518 can be achievable only with steady fuel parameters in conventional fuel and the station heat rate achievable is in the range of 4000 + / - kcal / kwh. Hence, the fuel consumption of 1.80 kg / kwh may be adopted.

Thiru S.V.Balasubramaniam: Due to quality of sugar cane, moisture etc, station heat rate is different which may be 4000 +/- 100 kcal / kwh. What is given in the DPR is not to be taken as it is not the actual.

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: The actual calorific value of the baggase is only 2272 Kcal/Kg due to higher moisture content and hence, the actual station heat rate comes to 4000 k.cal./kwh. Commission may permit to use coal in the off season so that the promoters can get the variable of coal along with the fixed cost.

Thiru M.R.Krishnan, Consumers Association of India: The time given by the Commission for public hearing is not sufficient for preparing the notes. Competitive bidding in procurement should be introduced. Commission can review the performances of service providers. Most of the assumptions in the consultative paper are based on the better parts of the other Commission reports. Using of Coal should not be allowed in baggase based generation.

9. Fuel Cost

TNEB – It may be fixed below Rs.800 /MT

MNRE – minimum Rs.200/MT may be added towards the cost of freight, loading, unloading, cutting and chipping

SISMA – Recently, the Co-operative Sugar Mill Federation has finalized the tender for bagasse at Rs.1040/- MT ex-factory. The barter arrangement between some of the sugar mills and TNPL. In this instances, the value of bagasse works out to Rs.1958/- MT as under:-

- Landed cost of 5800 kcal/kg coal at sugar mill - Rs.5000/
- Equivalent value of Bagasse for 2272 kcal/kg – Rs.1958

Thiru A.Vellayan: TNPL pays Rs. 2000/-MT; this may be taken into account.

Thiru S.Kathiresan: As per the order of other Commissions, the fuel prices are in the range of Rs.800 to 900 per MT

Thiru S.V.Balasubramaniam: The price paid to Co-op. Sugar Mills is Rs.1040/-. To arrive at the delivery cost, transport cost of Rs.250/- MT is to be added.

Thiru T.B.Chikkoba and Thiru. K.Venkatesan: Rs 1000/MT with 5% escalation per annum seems to be reasonable

10. Auxiliary Consumption

TNEB – 9% is accepted

IREDA – the auxiliary consumption is in the range of 10%

MNRE- about 1% may be added for cutting and chipping

EID Parry – The auxiliary consumption in Tamil Nadu is 9.50% to 10%

11. CDM Benefit

TNEB – Passed on to the utility in proportion to the energy exported.

IREDA – normally available for projects with marginal viability and it is not the usual practice of sharing with the STU and distribution licensee and it is difficult to monitor.

MNRE – FOR suggestion may be adopted

SISMA – The costs are continuously incurred for auditing of the emission reductions on annual basis even after the project is commissioned. In view of the above, CDM benefit, if any, should accrue to the Project Developer only.

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: Generator alone may avail the entire CDM benefits.

Thiru K.Vijayarajan, Director, M/s.ABI Energy Consultancy Service (P) Ltd: It is only after the year 2000; few projects have been registered for CDM benefits. Only the project which requires financial additionality have been considered for CDM benefits. The transaction cost for getting CDM benefits is about 5 to 25% of the CERs.

Thiru K.Raghunathan, MD, EID (P) ltd: As various administrative expenses are involved in getting the CDM benefits, it may be permitted to be held by the Generators

12. Evacuation Facilities

TNEB – Restoration of earlier practice of carrying by Board on DCW basis may be considered

EID Parry - Termination of PPA on account of failure in payment by TNEB and Termination of agreement by TNEB the evacuation cost need not be reimbursed.

Thiru Siva Subramanian, Sakthi Sugars: We have spent around Rs.5.5 crores for evacuation and this amount may be included in the capital cost.

13. Energy Purchase

TNEB – Already the Board is in stringent financial position. Hence, the proposed provision of opening bankable security may be dropped.

EID Parry – any default by the TNEB to pay the bills, the generator can terminate the agreement. In case any delay in payment, payment may be made with 2% over and above PLR for delayed period.

SISMA- The agreement period may be considered for 5 years. A clause may be incorporated providing for payment of interest at 18% p.a for payment delay.

14. Transmission & Wheeling Charges

TNEB – Cross subsidy surcharges should be 100%.

SISMA – Cross subsidy charges may be waived

15. Applicability of Order

EID Parrys – The generator shall be permitted to enter into the execution of the EPA pending finalization of this order and this order shall become applicable as and when the.

SISMA- It may be clarified as to how the fixed cost will be determined – whether it will be with reference to the current life of the plant eg., for a plant commissioned in 1996, whether fixed cost 14th year will considered while arriving at the applicable tariff.

Thiru K.Venkatesh, M/s.Rajshree Sugars, Coimbatore: The projects commissioned prior to the proposed order and after the end of the

control period should be treated as new projects for the purpose of fixing new tariff order.

Thiru A.Senthilkumar, M/s.TANFAC India Ltd: We have captive power plant based on waste heat recovery from chemical process. The tariff fixed by TNERC is only Rs.3.15 per unit. Since ours is a co-generation plant, This should be treated on par with the bio-mass power plant. We are not able to make agreement with TNEB for sale of electricity since our consumption is less than 51%.

Thiru M.P.Vasanth: The date of commissioning is not relevant since previously it was a single part tariff, but the proposed tariff is two part tariff and therefore the applicability is to be clearly spelt out. Agreement period is 20 years but the tariff is calculated based on the 12 years.

16. Cross Subsidy

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: Cross subsidy surcharge may be waived.

17. Billing and Payment

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: Payment to the promoters shall be paid within 30 days and any delayed payment over 30 days, interest at 18% per annum shall be paid to the promoter.

18. **Tax on Generation**:

Thiru V.Thiagarajan, CMD, Thiruarooran Sugars: The matter of levying taxes on generation and consumption is under litigation and the same may be accommodated in the tariff order.

Annexure -VII

GUIDELINES OF THE GOVERNMENT OF INDIA ON POWER GENERATION FROM NON-CONVENTIONAL ENERGY SOURCES

Annexure -VII

GUIDELINES FOR PROMOTIONAL AND FISCAL INCENTVIES BY STATE GOVERNMENTS FOR POWER GENERATION FROM NON-CONVENTIONAL ENERGY SOURCES

1. OPERATIVE PERIOD

The scheme of promotional and fiscal incentives will come into operation with immediate effect and will remain in force for a period of five years.

ELIGIBLE PRODUCERS

Those generating electricity and feeding in full or part to the State Grid from Non-Conventional Energy Sources such as wind electric generators, small hydro plants, biomass combustion and co-generation, etc., there will be no restriction on generation capacity or supply of electricity to the grid. Consortia or co-operatives will also be eligible.

2. GRID INTERFACING

i) Interfacing, including transformers, panels, kiosk, protection, metering, H.T. lines from the points of generation to the Board's nearest HT lines, etc., as well as maintenance, will be undertaken by the producer as per the specifications and requirements by the producer as per the specifications and requirements of the Board, for which he will bear the entire cost. Alternatively, these works and their maintenance could be undertaken by the Board, at charges to be decided by the board.

ii) Depending upon the generation capacity, if the sub-station capacity at 33/11 KV or higher levels is required to be augmented or 66 KV or higher capacity transmission lines are to be provided, this will be undertaken by the Board, at their cost.

iii) Two separate meters one for the export of power to the grid, and another for import from the grid, will be installed on the HT side by the producer. The meters and metering boxes will be sealed by the Board.

iv) Necessary current limiting devices such as thyristors will be installed in the generating equipment of the producer. Capacitors of sufficient rating will also be

provided in the equipment to ensure that the power factor is always maintained above 0.80

3. FACILITY BY SEB

i) Wheeling

The State Electricity Board will undertake to transmit on its grid the power generated, and make it available to the producer for captive use or to a Third Party within the State, at a uniform wheeling charge of 2 % of the energy fed to the Grid, irrespective of the distance from the generating station. The Third Party must be a H.T. Consumer of the Board, unless this stipulation is relaxed specifically by the SEB.

ii) Banking

The State Electricity Board will permit the electricity generated to be banked for a period upto to one year.

iii) Sale of Power

The State Electricity Board will purchase electricity offered by the producer at a minimum rate of Rs.2.25 /unit, with no restriction on time or quantum of electricity supplied for sale. This rate will be reviewed every year, and will be linked to standard criteria such as wholesale price index. The producer will also have the option to sell the electricity generated by him to a Third Party within the State (as defined 3 (i) above), at a rate to be mutually settled between them.

iv) All transactions between the Board and the producer involving wheeling, banking or sale of power will be settled on a monthly basis.

v) Exemption from duty

Consumption of electricity generated by the producer will be exempted from electricity duty.

vi) Exemption from demand cut

The exemption from demand cut to the extent of 30% of the installed capacity of the producer will be given by the Board.

4. OTHER INCENTIVES

i) Sales Tax benefits will be available to the producer, who owns the project (Resolution of the Govt., off Gujarat dated 27th January, 1993 is enclosed for guidance)

ii) The producer will be allowed to use the water for power generation. Royalty on the water used for small hydro projects will be charged at a rate not exceeding 10% of the prevailing electricity tariff for HT consumers.

iii) Power generation from non-conventional energy sources will be treated like any other industry, and incentives normally available to new industrial units can be availed.

iv) Concessions given to industrial units in backward areas will be provided, such as exemption from taxes and duties, capital subsidies, etc.

v) Infrastructural facilities such as approach roads, water supply, crane, power during construction period, etc., will be provided on the lines of industrial estates.

5. APPLICATION AND CLEARANCES

i) Producers should submit their application for setting up the project and for grid interface in the Proforma to the State Nodal Agency / State Electricity Board (simple composite application form should be devised which include all statutory approvals such as Chief Electrical Inspector, etc.,)

ii) Clearance will be provided within a period of two months from the date of application.

iii) An agreement will be entered into with the producer within a period of one month from the date the clearance is provided.

iv) If the applicant does not take effective steps (i.e., at least 10 % of the total project cost should be incurred) to implement the project within six months from the date of obtaining possession of land, the Agreement could be terminated and the site allotted to another applicant. If, on the other hand, land is not provided

within three months from the date of Agreement, the applicant will have the option to terminate the Agreement.

GUIDELINES FOR FIXATION OF PURCHASE PRICE FOR POWER PRODUCED FROM NON-CONVENTIONAL ENERGY

1. The State Electricity Board will announce a base purchase price every year for the electrical energy purchased by it from non-conventional energy based power projects. These rates shall be valid from 1st April to 31st March of the following year.

The base electrical energy purchase price valid for 1994-95 shall be a minimum of Rs. 2.25 / kWh.

The base price shall be escalated at a minimum rate of 5% every year. Announcement of revised base prices shall be made by the SEB on 1st April every year.

The base prices shall be applicable to all non-conventional energy based power projects based on solar, wind, hydro, biomass, etc., for which Power Purchase Agreements are signed during a year.

2. A promoter / developer shall be entitled to receive the base price set out in PPA for all electrical energy delivered from his project to the State grid for the duration of the Power Purchase Agreement. The rate shall be equal to the base price in the year of signing of PPA, escalated at a rate of 5% per year for a period of 10 years, from the date of signing of the Power Purchase Agreement. From the end of the 10th year, and for the remaining duration of the Power Purchase Agreement, the new purchase price shall be equal to the purchase price at the end of the 10th year, or the High Tension (HT) tariff prevalent in the State at that time, whichever is higher.

3. A monthly invoice shall be submitted by the promoter / developer to the State Electricity Board, at its designated offices, for the net electricity supplied by him to the Board. The Board shall make payment of amounts due, calculated at the purchase price for that particular year, within a period of 30 days.

The Board shall also provide facilities of an escrow amount or an irrevocable, transferable, divisible and confirmed standby letter of credit issued by State Bank of India, or another nationalized bank, acceptable to the promoter / developer. The amount of the letter of credit shall be equal to the expected total of two years payment by the Board.

The ensure prompt realization of the dues, and in order to provide a security cover, the Board shall issue 'Electricity Credit Notes' to the promoter / developer equivalent to the amount of electricity received by the Board, whenever it is unable to pay in cash within the stipulated period. The Electricity Credit Notes shall be transferable to one or more High Tension consumers of the Board, who will be allowed to adjust the amount for which the Credit Notes have been issued, from their electricity bills due to the Board. The validity of Credit Notes shall be six months.

4. The duration of the Power Purchase Agreement shall be a minimum of 20 years, which could be extended by another 10 year, through mutual agreement.

Annexure VIII

Components of Bagasse based Co-generation Tariff

Parameters	Values
Capital Investment	Rs.4.67 Crores per MW
Plant load factor (PLF)	55%
Debt Equity Ratio	70 : 30
Term of Loan	10 years with one year moratorium period
Interest on Loan	12.00% p.a
Return on Equity (RoE)	19.85%
Life of the Plant	20 years
Depreciation on 85% of capital investment	4.5% p.a on SLM
O & M Charges for Machinery on 85% of Capital investment	4.50% wih escalation of 5% from 2nd year
O & M Charges for land and civil works on 15% of Capital investment	0.90% with escalation of 5% from 2nd year
Insurance charges for machinery on 85% of capital investment	0.75% with reduction of 0.50% after one year
Station Heat Rate	3840 kcal per kwh
Calorific value of fuel	2300 kcal per kg
Specific fuel consumption	1.67 kg per kwh
Fuel Cost	Rs.1000 per MT
Working Capital	Fuel stock - one month, O & M - one month and Receivables - one month
Interest on working capital	12.00% p.a
Auxiliary consumption	10%

Annexure - IX

Working Sheet of Tariff computation for the projects commissioned on or after19-09-2008

Year	O & M charges at 4.5% for machinery on 85% of capital investment and at 0.90% for land and civil works on 15% of capital investment with 5% esclation from 2nd year	Insurance at 0.75% on 85% of capital investment and reduction of 0.5% after one year	Interest on loan @ 12.00 % p.a	Depreciation at 4.5% on 85% of capital investment	Working capital					Return on Equity @ 19.85% p.a	Total fixed cost	Fuel Cost @ Rs.1000 per MT with 5% annual escalation	Nett Units generated for one MW @ 55% PLF with 10% auxiliary consumption	Fixed Cost per unit	Variable cost per unit	Total Cost per unit
					one month O & M Expenses	One month Fuel stock	One month receivables	Total	Interest @ 12%.p.a							
	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Units)	(Rs)	(Rs)	(Rs)
1	1849320	297713	3922800	1786275	154110	670505	1580985	2405600	288672	2780985	10925765	8046060	4336200	2.520	1.856	4.376
2	1941786	296224	3922800	1786275	161816	704030	1622924	2488770	298652	2780985	11026722	8448363	4336200	2.543	1.948	4.491
3	2038875	294743	3530520	1786275	169906	739232	1633946	2543084	305170	2780985	10736568	8870781	4336200	2.476		
4	2140819	293269	3138240	1786275	178402	776193	1647177	2601772	312213	2780985	10451801	9314320	4336200	2.410		
5	2247860	291803	2745960	1786275	187322	815003	1662727	2665052	319806	2780985	10172689	9780036	4336200	2.346		
6	2360253	290344	2353680	1786275	196688	855753	1680713	2733154	327978	2780985	9899515	10269038	4336200	2.283		
7	2478266	288892	1961400	1786275	206522	898541	1701255	2806318	336758	2780985	9632576	10782490	4336200	2.221		
8	2602179	287448	1569120	1786275	216848	943468	1724483	2884799	346176	2780985	9372182	11321614	4336200	2.161		
9	2732288	286010	1176840	1786275	227691	990641	1750530	2968862	356263	2780985	9118662	11887695	4336200	2.103		
10	2868902	284580	784560	1786275	239075	1040173	1779536	3058785	367054	2780985	8872357	12482080	4336200	2.046		
11	3012347	283157	392280	1786275	251029	1092182	1811651	3154862	378583	2780985	8633628	13106184	4336200	1.991		
12	3162965	281742		1786275	263580	1146791	1847029	3257400	390888	2780985	8402854	13761493	4336200	1.938		
13	3321113	280333		1786275	276759	1204131	1918854	3399744	407969	2780985	8576675	14449568	4336200	1.978		
14	3487169	278931		1786275	290597	1264337	1994276	3549211	425905	2780985	8759265	15172046	4336200	2.020		
15	3661527	277537		1786275	305127	1327554	2073476	3706157	444739	2780985	8951063	15930648	4336200	2.064		
16	3844603	276149		1786275	320384	1393932	2156642	3870958	464515	2780985	9152527	16727181	4336200	2.111		
17	4036834	274768		1786275	336403	1463628	2243974	4044005	485281	2780985	9364142	17563540	4336200	2.160		
18	4238675	273394		1786275	353223	1536810	2335678	4225710	507085	2780985	9586415	18441717	4336200	2.211		
19	4450609	272027		1786275	370884	1613650	2431973	4416508	529981	2780985	9819877	19363803	4336200	2.265		
20	4673140	270667		1786275	389428	1694333	2533090	4616851	554022	2780985	10065089	20331993	4336200	2.321		

Annexure X

Fixed Cost Computation for the projects commissioned prior to 19-09-2008

Year	Interest @ 9% for ten years with one year morotorium	O & M Exp 4.5% with 5% escl	Insurance 0.75% for fiveyears and reduction of 0.5% p.a	Depreciation 7.84%	ROE 16%	Interest on working capital				Total Fixed Cost	Fixed cost per unit
	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	O&M 2 months (Rs)	Fule 2 Months (Rs)	Total (Rs)	Interest (Rs)	(Rs)	(Rs)
1	2205000	1575000	262500	2744000	1680000	262500	738760	1001260	110139	8576639	1.956
2	2205000	1653750	262500	2744000	1680000	275625	775698	1051323	115646	8660896	1.975
3	1984500	1736438	262500	2744000	1680000	289406	814483	1103889	121428	8528865	1.945
4	1764000	1823259	262500	2744000	1680000	303877	855207	1159084	127499	8401259	1.916
5	1543500	1914422	262500	2744000	1680000	319070	897967	1217038	133874	8278297	1.888
6	1323000	2010143	261188	2744000	1680000	335024	942866	1277890	140568	8158899	1.861
7	1102500	2110651	259882	2744000	1680000	351775	990009	1341784	147596	8044628	1.835
8	882000	2216183	258582	2744000	1680000	369364	1039510	1408873	154976	7935741	1.810
9	661500	2326992	257289	2744000	1680000	387832	1091485	1479317	162725	7832506	1.786
10	441000	2443342	256003	2744000	1680000	407224	1146059	1553283	170861	7735206	1.764
11	220500	2565509	254723	2744000	1680000	427585	1203362	1630947	179404	7644136	1.743
12	0	2693784	253449	1316000	1680000	448964	1263530	1712494	188374	6131608	1.399
	14332500	25069474	3113615	31500000	20160000	4178246	11758936	15937182	1753090	95928680	