

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 123 of 2008

In the matter of
Petition filed by Cogeneration Association of India for review of the tariff rate and tariff structure for Bagasse based Grid Connected Cogeneration Projects.

Shri. V. P. Raja, Chairman
Shri S. B. Kulkarni, Member
Shri V. L. Sonavane, Member

Cogeneration Association of India
1st floor, Sakhar Sankul
Shivajinagar,
Pune 411005

... Petitioner

Vs.

Sugar Commissioner, Maharashtra State,
Sakhar Sankul,
Shivaji Nagar, Pune 411 005

... Respondent

ORDER

January 11, 2010

The Cogeneration Association of India (CAOI) filed a Petition under affidavit before the Commission on November 5, 2008, seeking review of the tariff rate and tariff structure for bagasse based grid connected cogeneration projects determined under Order dated August 16, 2002, in Case No. 8, 9, 10, 15, 17, 18, 19, 20, 21 of 2001.

2. CAOI, vide its Petition, made the following prayers to the Commission:

“M/s. Cogeneration Association of India requests the Commission to review the tariff of Rs. 3.05/unit in the first year of operation with 2% annual compounded escalation. Sugar mills who are proposing to install bagasse cogen projects are facing serious difficulties in financial closure with Maharashtra State Co-operative Bank, NCDC and other scheduled banks. The major reason for the same is the low financial viability of bagasse cogen projects at the present tariff, hence, this Prayer. This Prayer takes reference to section 94(f) of the Electricity Act, 2003.”

3. CAOI submitted that several major changes have taken place since 2002, which have a direct impact on the tariff rate and structure, as under:

- i. Open Access and Renewable Power Purchase Obligations;
- ii. Wholesale Price Inflation (WPI) Index for fuel, power, light and lubricants has risen by 35% from 239.20 in FY 2002-03 to 324.00 in FY 2006-07;
- iii. Project cost has increased to Rs. 4.5 Crore per MW or higher. With this project cost and the present tariff, the DSCR is 1.37 with project rate of return of 10.8%. The variable costs have increased substantially;
- iv. Average crushing days of sugar factories in operation in Maharashtra was 146 in FY 2007-08 and 175 in FY 2006-07;
- v. Operating data of five sugar cogeneration projects on actual basis indicates generation cost of Rs. 4.07 per unit;
- vi. Increased demand-supply gap in the State leading to procurement of expensive energy, which does not account for efficiency of generation;
- vii. Lower penetration of bagasse cogeneration projects;

4. CAOI submitted that the sugar mills in Karnataka are receiving above Rs.6 per unit for the last seven months for the power exported to power traders. Further, private power traders have expressed interest in purchasing power from proposed bagasse based co-generation projects in Maharashtra and have indicated short-term power purchase rate of about Rs. 6 per unit and long-term power purchase rate of about Rs. 5 per unit. CAOI added that the proposed bagasse based co-generation projects are achieving financial closure based on the above assumption of sale of power to traders. The required financial norms of DSCR are not met by the existing tariff of Rs. 3.05 per unit in first year with 2% annual compounded escalation.

5. CAOI submitted that during the crushing season of FY 2007-08, 173 sugar factories were in operation in Maharashtra and cumulatively crushed 76.2 million tons of sugarcane with average sugar recovery of 11.94% in 146 average crushing days. They had cumulative turnover of about Rs. 10920 Crore. Projects taken up by co-operative sugar mills need to have financial viability for the benefit of all stakeholders and also need to serve the underlying purpose of benefit to the society at large, State and local area. CAOI added that to enable the projects to be financially viable, it is inevitable for bagasse based co-generation projects to tie-up with private power traders at estimated tariff of above Rs. 4.5 per unit for achieving financial closure. CAOI submitted that in case the potential for power generation from co-operative sugar mills in Maharashtra is exploited, then the exportable power generated from such bagasse based co-generation plants may be able to address the rising demand-supply gap in Maharashtra. Therefore, they prefer to sell the power to the State Utility and improve the power supply situation, which has an impact on sugarcane cultivation also. With this view, CAOI filed a Petition to review the tariff at existing costs and provide adequate tariff to meet the financial norms of the banks of having average DSCR above 1.5. They added that as per financial analysis carried out for highly efficient bagasse based co-generation projects, the minimum viable tariff to achieve the bank norms is Rs. 4.5 per unit. Therefore, CAOI prays to the Commission to revise the tariff, accordingly.

6. CAOI submitted that the Renewable Purchase Specification (RPS) framework specified by the Commission requires progressively increasing procurement of renewable power from 3% to 6% from FY 2006-07 to FY 2009-10, respectively, by the Utilities. CAOI expressed its concern that if all proposed bagasse based co-generation projects enter into Agreements with power trading companies, substantial difficulty may be faced by the Utilities to meet their RPS obligations. The National Electricity Policy and Tariff Policy also recognise the present high cost of renewable energy generation and need for preferential tariffs. Globally, feed-in tariffs, tax incentives, tradable certificates, low interest loans, loan guarantees, etc., have contributed to sustained growth of renewable energy. Considering the role of bagasse based co-generation in facilitating Utilities to meet their RPS obligation and the global concern for catalysing growth of renewable power, CAOI prayed for review of the tariff to a sustainable level.

7. Further, CAOI submitted that the growth rate of the WPI for fuel, power, light and lubricants has been 8% compounded annually. Increase in wages, salaries, operation and maintenance cost, lubricants has also been at similar levels. The anticipated rise of sugarcane price by farmers has been much higher. Considering the same, CAOI prayed to the Commission to review the 2% annual compounded escalation rate in the tariff to the level of 5%.

8. As regards the cost of the project, CAOI submitted that the project cost has increased to Rs. 4.5 Crore per MW or higher and with this project cost and the present tariff, the Debt-Service Coverage Ratio (DSCR) works out to be 1.37 with 10.8% rate of return. All variable costs have increased substantially. CAOI submitted that the average capital cost considering the boiler and turbine procurement costs approved by the Commissioner of Sugar, Maharashtra for 11 cogen projects having installed capacity of 170 MW works out to Rs. 2.15 Crore per MW, without taxes. Considering an overall tax impact of 4%, the average boiler and turbine cost would be Rs. 2.24 Crore per MW. In cogeneration projects of typical capacity range of 10 to 40 MW, the boiler and turbine constitutes about 45% to 50% of the project cost. This would lead to project costs of Rs. 4.5 to Rs. 5 Crore per MW, excluding the costs of available infrastructure of sugar mill including land, reservoirs, existing fuel handling, residential quarters, etc. Further, it does not take into account the necessary pre-requisite costs of sugar mill modernisation.

9. CAOI added that off-season operations at sustainable Capacity Utilisation Factor (CUF) with only locally available biomass are not feasible. Support of fossil fuel like coal is essential. MNRE has also acknowledged the same and given a norm for utilisation of fossil fuel upto 25% by heat value. Though fuel cost pass through is not envisaged, the global rise in the oil prices has had an impact on coal prices and imported coal prices have increased to a landed cost of Rs. 6000/tonne. Annual recorded inflation rates have had direct impact on other variable costs, including spares, lubricants, consumables, R&M services, etc. The Fifth and Sixth Pay Commission have also had an impact on the wages and salary levels. Therefore, considering the above sharp increase in fixed and variable costs, CAOI prayed for corresponding review of the tariff.

10. CAOI submitted that the average crushing days of sugar factories in operation in Maharashtra was 146 in FY 2007-08 and 175 in FY 2006-07. The Commission, in its earlier Order, had considered 180 days of sugar crushing season operation. However, CAOI added that the average for the last five years is below 150 days and the average for the last two seasons is 160 days. There is a distinct pattern of decrease in sugar season and higher capacity utilisation of the sugar mill. These are due to various factors including requirement of increasing average season recovery, availability of sugar cane, changing climate conditions, etc. This may not have serious impact on the sugar mill economics but will substantially reduce the annual PLF or capacity utilisation of the co-generation project. Therefore, CAOI prayed to the Commission to review the tariff based on 160 days sugar crushing season operation.

11. As regards the operating data, CAOI submitted that the generation cost of five bagasse based co-generation projects is in the range of Rs. 3.02 to Rs. 4.07/unit. The penetration of bagasse based co-generation has been low in the co-operative sugar mills in the State. Further, CAOI submitted summary data on five bagasse based co-generation projects having installed capacities between 8-16 MW as Appendix II. They added that the Commission in its earlier Order had acknowledged the requirement of higher rate of return of 20% for bagasse based co-generation projects, considering the infirm fuel supply scenario. CAOI prayed to acknowledge the actual fixed and variable cost being incurred and review the tariff.

12. CAOI submitted that in the present scenario of increasing demand-supply gap in the State leading to procurement of expensive energy, which does not account for efficiency of power generation there is a grave concern about the demand-supply gap in the State and the unpleasant load shedding. Expensive power is being sourced by all Utilities to mitigate the demand-supply gap. Reliability charges or expensive power charges are being levied and expensive power is being purchased above Rs. 7/unit. The Pune Captive Power Model also demonstrated the advantages of purchasing expensive power from spare capacity of DG sets. During such ad-hoc purchases, there is no evaluation of the efficiency of the power generation. Pune market economics and competitive bidding determined the traded power cost. They added that the Commission in its earlier Order has distinguished between incidental and non-incidental bagasse based cogeneration projects. Incidental co-generation projects are those, which supply available excess power from existing back-pressure turbines. In the event that there is no purchaser for this power, some part of the steam for process is obtained through a pressure-reducing valve. In the present scenario, many inefficient generators are also sustaining operations by supplying expensive power. Back-pressure power generation or incidental co-generation will have cycle efficiency of above 80%. Providing a lower tariff of Rs. 1.95/unit for incidental cogeneration has shifted the attention of all sugar mills to full-fledged co-generation projects. Incidental co-generation projects can be commissioned within 3-4 months and can provide some relief in load shedding in the local areas. In the present scenario and to reduce the overall procurement cost of expensive energy, these projects need to be encouraged. They added the power generated from the incidental cogeneration project is purely renewable in nature. Also, no other major sugar producing State has made this distinction between incidental and non-incidental co-generation. Based on this, CAOI prayed to the Commission to remove the distinction between incidental and non-incidental bagasse based co-generation projects, and provide similar tariff of non-incidental bagasse based co-generation to incidental bagasse based co-generation.

13. CAOI submitted that as against the plausible potential of 1250 MW from bagasse based cogeneration projects, the penetration is only 11% in Maharashtra. The penetration

is much lesser if reviewed in terms of units of power exported to grid. As against the Tenth Plan projection of addition of 500 MW of power from bagasse based co-generation projects by MEDA, the actual achievement was in the order of 125 MW. A target capacity addition of 900 MW has been envisaged by MEDA during the Eleventh Plan. Higher penetration of wind based projects can be attributed to the availability of accelerated depreciation. The same is also available for bagasse based co-generation projects. However, under the co-operative structure followed in Maharashtra, the practice is to share any surplus after deducting all expenses from all revenues as cane price payable to the cane growing farmers. Hence, major advantage of corporate tax optimisation in renewable energy projects does not have any impact on the financials of co-operative sugar mill operations.

14. CAOI submitted that lower penetration of cogeneration power projects during the period from 2002 to 2005 can be partially attributed to the drought situation in Maharashtra, which led to lower cane crushing, and had an impact on the fund raising capability of the sugar mills. CAOI added that lower penetration of cogeneration projects after FY 2004-05 is an area of concern. Large scale dissemination of techno commercial information of successful bagasse based cogeneration projects has been provided to the sugar mills in Maharashtra. All sugar mills have expressed interest in installing grid connected projects and carried out site specific studies. The present tariff does not ensure bankability of the projects. Further, CAOI submitted that more bagasse based co-generation projects have achieved financial closure after the Open Access Policy and commencement of export of power to power traders by bagasse based co-generation units in Karnataka. Higher penetration may be achieved in the coming years in anticipation of desirable tariff from power traders. However, CAOI expressed its concern on the flow of power outside the State and outside the RPS framework and therefore, prayed to the Commission to increase the tariff of bagasse based co-generation projects to present realistic pricing of Rs. 4.5/unit, which will help in creating a win-win situation for all the developers, State Utilities, cane growing farmers and society at large.

15. The Commission vide its letter dated December 12, 2008, scheduled an admissibility hearing in the matter on January 21, 2009. Further, the Commission directed CAOI to serve a copy of its Petition to all the Distribution Licensees, Maharashtra Energy Development Agency (MEDA), and all the four authorised consumer representatives and directed the Distribution Licensees, MEDA and the consumer representatives to file their comments under affidavit latest by December 31, 2008.

16. MEDA, vide its letter dated December 26, 2008, requested the Commission to extend the period for submission of comments till January 20, 2009 in view of certain clarifications to be sought from the Petitioner and to collect relevant data from concerned

organisations/authorities before filing their response. In addition, MEDA submitted that the Commissioner (Sugar), being the administrative head of co-operative sugar mills, their submissions in the matter would be useful and requested that Commissioner (Sugar) may be made Party (respondent) in this Petition.

17. M/s Yash Agro Energy Ltd., filed an Intervention Application under affidavit dated January 9, 2009, and submitted that it is a biomass based cogeneration unit and even though the CAOI is seeking review of tariff for bagasse based cogeneration units, the Commission should take into account all the non- fossil fuel based cogeneration units for the purpose of review of the tariff structure. Further, M/s Yash Agro Energy Ltd added that the biomass based cogeneration units are neither covered under biomass based Independent Power Plants (IPPs) nor under bagasse based cogeneration units. Being a biomass based cogeneration unit, the Applicant is entitled for revision in tariff at a higher rate than the one prescribed for biomass based independent energy generation Units. Further, they added that once the character of the Unit as biomass based energy cogeneration unit is accepted, the tariff and revision in tariff based upon the generation cost would be applicable for all non-fossil fuel based cogeneration projects. Being a cogeneration unit, the requirement of fuel is higher as compared to biomass based IPPs. M/s Yash Agro Energy Ltd added that it has to procure biomass from the market, unlike bagasse, which is produced in-house in sugar/bagasse cogeneration power plants. Hence, the biomass based cogeneration units need to be treated separately in the revised tariff schedule and the revision in rate of purchase of electricity by State licensees should be made equally applicable to biomass based cogeneration units. Therefore, it would be a comprehensive Order applicable to all non-fossil fuel based cogeneration units. M/s Yash Agro Energy Ltd, vide their IA, made following prayers to the Commission:

- i) *“grant permission to the applicant to intervene in the matter.*
- ii) *issue appropriate directions that the revision in tariff for purchase of electricity would be applicable for all non-fossil fuel (biomass) based energy cogeneration units also and accordingly the applicant would be governed by the revision in tariff which would be prescribed by this Hon’ble Commission in present proceedings including the date of its effect.*
- iii) *be declared that being a biomass based cogeneration unit, the tariff stipulated in EPA dated 25.10.2004 would stand modified to the extent of revision in tariff made operative by this Hon’ble Commission.”*

18. Further, Yash Agro Energy Ltd., under its affidavit dated January 20, 2009, provided additional data in support of its IA. Yash Agro submitted that the Commission, in its Order dated August 16, 2002, has determined the price of bagasse on the basis of

equivalent heat value of coal used by thermal generating stations within the State for FY 2001-02. The fuel price for each station in terms of Rs./Tonne equivalent to heat content of 2250 kcal/kg was derived and thus, the Commission considered Rs. 559/tonne as price of bagasse. Considering the same logic, the price of biomass having calorific value of 3200 kcal/kg is arrived at Rs. 795 per tonne in the year 2002. M/s Yash Agro Energy Ltd added that in accordance with the CEA's recommendations upheld by the Appellate Tribunal for Electricity (ATE) in its Order dated September 7, 2006, in Appeal No. 20 of 2006, the Station Heat Rate (SHR) for all biomass based power plants is revised to 4500 kcal/kWh. The calorific value of the biomass is considered as 3300 kcal/kg. Hence, the specific fuel consumption works out to 1.36 kg/unit. Further, the Commission in its Order dated August 8, 2005 for biomass IPPs, has considered biomass consumption of 1.15 kg/unit with SHR of 3650 kcal/kg and considering the present average rate of biomass of Rs. 1800 per tonne, the fuel cost per unit for biomass based cogeneration plants has been arrived at Rs. 2.45 /unit as against Rs. 0.91 /unit as considered earlier. Yash Agro submitted a work sheet indicating the average fuel cost per unit of Rs. 3.82 per unit and the total cost of generation of Rs. 6.06 per unit for the first year of operation.

19. The Maharashtra State Electricity Distribution Co. Ltd., (MSEDCL) vide its letter dated January 20, 2009, submitted that it has no objection to reasonable/justified increase in tariff, as MSEDCL has always strived to promote such RE generation in the State. MSEDCL has no expertise to verify the rate estimated/calculated by CAOI. Therefore, on the basis of certification/verification from the Commissioner of Sugar, MEDA and other expert bodies, the Commission may decide the appropriate/justified rate.

20. Further, MSEDCL submitted that as regards the Prayer of CAOI for similar tariff for both, non-qualifying incidental cogeneration and qualifying co-generation may not be considered, since specific attention is required related to differences in plant operations of two types of co-generation plants involving distinct mechanical components and accessories, lubricants, additional man power required for supervision, etc., and which renders different scales of energy efficiency/energy conversion criteria under two types of co-generation units.

21. MSEDCL prayed to the Commission to assess the tariff for procurement of power from bagasse based co-generation projects covered under non-conventional energy sources with due vetting from Commissioner of Sugar, MEDA and other experts in this field. MSEDCL submitted that it intends to procure maximum possible generation from these sources and hence, a reasonable rate may be considered to ensure their financial viability.

22. During the hearing held on January 21, 2009, the Commission directed the Parties to submit concrete and documentary proof as available and data based on scientific

methodology. Further, the Commission directed the Parties to give views on taking the assistance of Commissioner of Sugar, Govt. of Maharashtra as has been asked by MEDA for submitting the data.

23. M/s Yash Agro Energy Ltd, under its affidavit dated February 20, 2009, submitted its audited records indicating cost of fuel, other variable costs, fixed costs and total cost of per unit generation.

24. CAOI, vide its letter dated July 13, 2009, submitted that bagasse based co-generation projects being set up have faced difficulty in achieving financial closure with prominent co-operative banks including Maharashtra Co-operative Bank and National Co-operative Development Corporation as also other scheduled banks. In the past, the average bagasse price was Rs. 2500/tonne. In the off-season, an efficient plant would require 3.9 kg of steam/kW. An efficient boiler would provide for a steam to fuel ratio of 2.46, which will amount to variable cost of Rs. 3.96/kWh. Further, if the co-generation plant is operating only during sugarcane crushing season of 160 days, the per unit fixed cost would escalate. CAOI added that the weighted average cost of traded power in March 2009 was Rs. 8.33/kWh. CAOI also highlighted that as per MSEDCL's submission, MSEDCL does not have any objection for appropriate review of tariff and it will help them achieve RPS target.

25. MSEDCL, under its affidavit dated September 2, 2009 submitted that MSEDCL has always strived hard to procure power from the non conventional energy (NCE) sources in the State in line with the principles laid by the Commission. Further, the Commission in its Order dated August 16, 2006 has specified certain percentage of energy to be procured from Renewable Energy.

26. Further, MSEDCL added that GoM vide their resolution dated October 14, 2008, issued a Policy to promote generation from non-conventional sources in the State. The Policy highlights various provisions and concessions to achieve the target of 1000 MW from cogeneration power projects, 400 MW from IPPs based on biomass, 100 MW based on SHP power project and 2000 MW from wind power projects. MSEDCL submitted that all the project holders are intending for sale of power to third party other than MSEDCL at higher rates. This is being done due to prevailing high prices of electricity in the electricity market and possibly due to high enforcement charge under the RPS. Further, if MSEDCL is unable to procure this clean power then it will have huge impact on MSEDCL, i.e.,

- a. MSEDCL will have to procure costly power in the range of Rs. 6.00 to Rs. 7.00 per unit, in order to meet the demand-supply gap and the consumers of MSEDCL have to bear the cost incurred on costly power purchase.

- b. The rate if not rationalised, the generators may not be able to sustain financially and may also face closure. Further, the co-generation plants who have duly entered into EPAs with MSEDCL and are due for commissioning may delay commissioning of their plants to escape from existing agreements and may adopt various litigious steps. Then MSEDCL would not be in a position to meet the RPS percentage specified by the Commission in its Order dated August 16, 2006;
- c. Further, if MSEDCL undertakes competitive bidding process, then there is a possibility that the project holders might form a cartel and increase the prices resulting in unpredictable power purchase cost.

27. MSEDCL under its affidavit dated September 2, 2009 prayed to the Commission to allow:

- i) *“The rate of 4.28/- per unit on ad-interim basis be allowed on consolidated basis for procurement of power from bagasse/biomass cogeneration projects in the state till such time MERC decides such higher rate for the cogeneration power after going through the due process of fixation for long term power procurement with an escalation of 2% per annum on compounded basis for tenure of 13 years.*
- ii) *The final rate of Rs. 3.17/- per unit be allowed on consolidated basis for procurement of power from NCNQ projects with an escalation of 2% per annum on compounded basis for a tenure of 13 years.*
- iii) *The existing cogeneration projects (7 Numbers) having EPA’s (in line with GoM policy) prior to 16.08.02 may be allowed to be considered under NCNQ policy with tariff mentioned thereof after expiry of their existing EPA. In case, any of these project holders establish that they are fulfilling the qualifying criteria for 45% topping cycle efficiency supported by the related document, then, they may be allowed to be considered for execution of EPA with a tariff as decided by MERC for the Qualifying Cogeneration projects.#*
- iv) *The final dispensation of tariff may be determined by the Hon’ble Commission with due vetting from MEDA and with a permission for pass through in ARR.*
- v) *MSEDCL may be permitted to execute EPA’s with ensuing project holders @ Rs. 4.28/- per unit till final decision in this matter.*

vi) *This enhancement in tariff on ad-interim basis may also be considered prospectively for the projects already in operation irrespective of year of commissioning.*

vii) *MERC may please direct the concerned (Distribution Licensees) for non procuring the NCE directly or through trader under their 5% quota (section 25.2 of Terms and Conditions of Tariff Regulation, 2005) without adopting regulatory process. This is required to stop unfair means of depriving MSEDCL from procuring NCE power.*

viii) *The Hon'ble Commission may grant an early hearing in this matter.*

ix) *The Hon'ble Commission may allow additional affidavit, if any.*

x) *Any other relief as may be deemed fit."*

28. Shree Renuka Sugars Limited, under affidavit dated November 20, 2009, submitted its Intervention Application dated November 8, 2009. Shree Renuka Sugars Limited requested the Commission for following the tariff structure for the year starting applicable period (2010-2015) with consideration to escalable components of tariff as mentioned in CERC guidelines:

Long season: 210 days/annum, operation time of co-gen plant-255 days/annum)

Proposed tariff: Rs. 5.90 per unit

Short Season: 120 days/annum, operation time of co-gen plant-165 days/annum

Proposed Tariff: Rs. 7.20 per unit

29. Shree Renuka Sugars Limited provided the rationale behind its proposed tariff as under:

- i) The policy of non-conventional energy sources has promoted the sugar mills to come out with bagasse based co-generation either by themselves or on BOOT basis;
- ii) It will enable every sugar mill to go ahead with bagasse based cogeneration projects, which will not only improve the balance sheet of the sugar mills but also enable them to pay the farmers in a better manner;
- iii) The mechanism will provide almost 500 MW of power, which will ease the demand supply situation;

- iv) Sugar being seasonal industry is heavily dependent on sugarcane as a raw material, which is further dependent on the monsoon. So the availability of 255 days of bagasse is difficult to achieve;
- v) The present price of bagasse is Rs. 2000 per tonne due to shortage of fuel and shorter crushing season;
- vi) In order to achieve better availability, the capital investment will be as high as Rs. 4.45 Crore/MW;
- vii) The O&M expenses are more than Rs. 13.35 Lakh/MW considered in the Order;
- viii) The SHR of 3600 kcal/kg as mentioned by CERC is difficult to achieve and should be higher;
- ix) As against the auxiliary consumption of 8.5% mentioned in the CERC Regulation, actual auxiliary consumption of 10% is experienced by plants operating country wide.

30. Shree Renuka Sugars Limited prayed to the Commission to approve tariff of Rs. 5.90 per unit for the first year of operation with an annual escalation of 5% every year.

31. The Commission, vide its Notice dated November 09, 2009, communicated that the matter would be heard further on November 23, 2009.

32. During the hearing, Shri Abhay Kulkarni, Business Manager and Shri. S.C. Natu were present on the behalf of CAOI. Shri. Abhijit Deshpande, Executive Director (Commercial), MSEDCL, Mrs. Vidya Murkumbi, Executive Chairperson from Shree Renuka Sugars Ltd. as Intervener, Shri. Rajendra Chavan, Commissioner of Sugar, Govt of Maharashtra, and Shri. S.A. Patil, MEDA were present.

33. The Petitioner submitted that the existing tariff for non-fossil fuel based grid connected cogeneration projects is no longer viable to run the plant due to various reasons like the crushing season for sugarcane reduced to 150-160 days from 180 days and due to scarcity in availability of bagasse, the price of bagasse has increased upto Rs 2000/MT. Further, capital cost for setting up cogeneration projects has increased up to Rs 4.5 Crore per MW and considering cost of modernization of sugar mill, biomass collection systems etc., the capital costs increases up to Rs. 5.5 to Rs. 6 Crore per MW. Under the circumstances, around 20 cogeneration projects that have already been commissioned, would find it difficult to sustain their operations. The Petitioner requested a positive intervention from the Commission and further requested that CERC RE Tariff Regulations may be applied for determining viable tariff at least on interim basis.

34. The Intervener, Shree Renuka Sugars Ltd. submitted that the prices of bagasse may be comparable to that for biomass but the capital cost for bagasse plants is higher than that for biomass plants. The Intervener also requested that the norms fixed by CERC may be considered for tariff determination.

35. MEDA stated that they have done study of four sugarcane factories and the average cost of production of bagasse based co-generation projects is about Rs.4.77 – 5.00/unit. Further, earlier 180 days of crushing season were considered, which has been reduced to 160-150 days. MEDA further suggested that interim tariff of around Rs 5.00/unit may be fixed along with indexation mechanism. The Commission enquired about the long-term cycle of sugarcane production and its relationship with availability of bagasse and also the uncertainties surrounding bagasse.

36. The Commissioner of Sugar responded that there exists a six-year cycle related to production of sugar and as per that cycle the production is high during the first two years, moderate during the next two years, and very less during the last two years.

37. The Commission enquired whether any organized market exists for bagasse procurement and sought suggestions for indexing bagasse price, if under operation. The Commission also suggested that issues related to old/existing co-generation projects and new co-generation projects need to be addressed separately. The Commission also sought clarification regarding alternate usage of bagasse and its implications on availability of bagasse for power generation. The Commission also sought a clarification as to what is the driving factor for developers to pursue co-generation projects, if tariff is unattractive and availability of bagasse is also questionable.

38. MSEDCL submitted that out of 464 MW of cogeneration projects for which EPAs have been signed by MSEDCL, only 21 projects totalling to around 171 MW are supplying power. In response to a Commission's query, MSEDCL confirmed that the statistics quoted actually referred to the commissioned co-generation projects. MSEDCL submitted that shortfall in capacity addition or availability of power from commissioned projects could be due to tariff, which has not been revised for some time. MSEDCL submitted that they do not have any objection to revision in tariff for cogeneration projects, however, revenue neutrality to MSEDCL should be ensured.

39. After hearing the Parties, the Commission directed the Petitioner to prepare and submit the proposed formulation for fuel (bagasse) cost indexation within 3 days along with replies to queries/clarifications sought during the hearing and directed the Respondent, viz., Commissioner of Sugar and Intervener, Shree Renuka Sugars Ltd. to

submit the data related to analysis of the shortfall in the sugarcane production and details regarding the fuel cost within 5 days.

40. The Commissioner of Sugar, vide its letter dated November 26, 2009, requested the Commission for additional period of 10 working days for submitting the reply. In response, the Commission, vide its letter dated December 10, 2009 granted its request for extension of time and directed the Commissioner of Sugar to furnish concrete data on bagasse scenario latest by December 15, 2009.

41. Commissioner of Sugar, vide letter dated December 7, 2009, submitted that to prepare a comprehensive report, relevant data like availability of bagasse, bagasse price index and bagasse control factors, if any, and other relevant details were asked from Member Secretary, Commission for Agricultural Costs and Prices (CACP), New Delhi, vide letter dated November 24, 2009. The Director CACP, New Delhi informed that CACP does not maintain any such details regarding bagasse scenario in respect of any State vide its letter dated November 30, 2009. As regards various queries raised by the Commission during the hearing, the Commissioner of Sugar submitted as under:

- i) Government of Maharashtra has taken a decision to support the cogeneration projects of the co-operative sugar factories by giving financial assistance. The Government of Maharashtra made a Resolution regarding the same on February 20, 2008. According to the Resolution and in line with the standard norms of debt and equity ratio of 60:40, the equity from sugar factories comes to 10%. Out of this 50% would be made available from 'Green Cess' and 50% from sugar factory. Soft loans from Sugar Development Fund (SDF) is 30%, remaining 60% loan will be raised from financial institutions like National Co-operative Development Corporation (NCDC), Maharashtra State Co-operative Bank or other Nationalised banks.
- ii) Initially, 55 co-operative sugar factories have been identified to take up the cogeneration projects. Around 1000 MW power is estimated to be produced during the next three years.
- iii) At present, 21 co-operative sugar factories are generating power and exporting around 118 MW power to the grid.
- iv) Out of 55 co-operative sugar factories, 35 sugar factories are projected to generate 590 MW and have been given administrative and financial approval for their cogeneration projects at a total cost of Rs. 2271 Crore.
- v) 18 Co-operative sugar factories have already started erection work and their projects will be commissioned by December 2010 for generating 272 MW. The Government has sanctioned and disbursed Rs. 35 Crore as part share capital to 16 co-operative sugar factories.

- vi) Out of 35 sugar factories, 6 sugar factories are on 'BOOT' basis for generating 110 MW and 2 sugar factories' cogeneration projects generating 80 MW will be erected under 'Urjankur Trust' (Green Cess).
- vii) Ministry of New and Renewable Energy (MNRE) Govt. of India, New Delhi, has declared a Policy to give certain amount of subsidy for generation of renewable energy. At present, subsidy is available for cogeneration projects at the rate of Rs. 40 Lakh/MW for boilers having pressure from 40 to 60 kg/cm², Rs. 50 Lakh/MW for boilers having pressure from 60 to 80 kg/cm², and Rs. 60 Lakh/MW for 80 kg/cm² and above. The maximum limit is up to Rs. 8 Crore per project.
- viii) As per State Government's Industry, Energy and Labour Department Resolution dated December 14, 2008, the following incentives are given to the sugar factories:
- a) 50% subsidy for evacuation arrangement;
 - b) Electrical Duty exempted for first ten years for the captive use of factory. It is also applicable to third party sale;
 - c) Subsidy of Rs. 1 Crore for High Voltage/Extra High Voltage to the cogeneration plants having PLF of 80%;
 - d) 3% sugar purchase tax exempted for 10 years. This facility is given to the existing co-operative sugar factories having co-generation plant.
- ix) Bagasse- It contains 50% moisture and its calorific value is 2250 to 2400kcal/kg
 Uses of bagasse: (a) Pulp Plants - Bagasse pulp is used for making all grades of paper such as wrapping, printing, writing, toilet tissue, towelling, corrugated, liner board bleached boards, etc. (b) Paper Industry (c) Newsprint Industry (d) Particle and fibre boards (e) Rayon grade pulp (f) As a fuel (g) Bagasse Briquettes (h) Charcoal (i) Producer gas (j) Fodder and feeds (k) Cultivation and Edible Mushrooms (l) Poultry use (m) Chemical Use- Furfural, Furfuryl Alcohol, Xylitol, Cellulose, Sucrolin, Ethanol, Activated Carbon, Hydrolysed Pith
- x) Why Cogeneration?
 Sugar factories inherently require steam and power for making sugar from sugarcane. Almost all sugar factories are having low pressure boiler and captive power T.G. set. Sugarcane contains approximately 30% of bagasse, which is directly burnt into the boiler. Due to low efficiency boiler, high consumption of bagasse is required. Almost all bagasse is burnt into the boilers. Saving and storage is also a problem as bagasse is highly inflammable. The burning of bagasse without sufficient output is nothing but national waste.
 In the cogen plant, high pressure and efficient boiler and machinery are fitted so that bagasse can be burnt efficiently and saved during season only, and giving

output of extra power. This power can be sold in the market and earns additional revenue.

- xi) Ministry of Consumer Affairs, Food & Public Distribution, Department of Food and Public Distribution, Government of India had given directions to the Sugar Cane Commissioner's to take policy initiatives to encourage the sugar factories in their State to take up bagasse based cogen power projects, vide letter dated July 17, 2009.
- xii) The price of bagasse varies from Rs. 350 per MT to Rs. 2500-3000 per MT. A few factories' bagasse purchase/sale rate for last 5 years is attached for reference.

42. The Commissioner of Sugar, under its submission under Table no.- 1 provided information regarding crushing, production and recovery of sugar and availability of bagasse within Maharashtra State over the period from FY 2004-05 to FY 2008-09 as summarised below:

Table-1: Information regarding crushing, production and recovery of sugar

Sr.	Crushing Year	Sugar crushing Factories			Crushing (Lakh MT)	Sugar Production (Lakh Quantities)	Sugar recovery (%)	Bagasse Production (LMT)	Estimated Bagasse Saving at 5% (LMT)
		Co-operative	Private	Total					
1	2004-05	83	18	101	194.54	223.21	11.49	56.42	2.82
2	2005-06	120	22	142	445.57	519.77	11.67	130.31	6.52
3	2006-07	141	22	163	797.39	909.47	11.39	223.82	11.19
4	2007-08	145	28	173	761.74	909.76	11.94	237.59	11.88
5	2008-09	116	28	144	400.42	461.44	11.52	133.82	6.69

43. The Commissioner of Sugar, under its submission at **Table no.- 2** has submitted information regarding bagasse price as under:

Sl. No.	Name of Sugar Factory	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10	
		Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)	Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)	Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)	Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)	Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)	Bagasse Purchase price (avg) (Rs/MT)	Bagasse Sale price (avg) (Rs/MT)
1	Someshwar- Pune	-	1500	-	470.24	-	387.75	-	295.06	-	1924.42	-	2567.27
2	Lokenete-Solapur	-	-	-	L-350	-	B-650	-	B-700	-	-	-	2200
3	Mula-Ahmadnagar	-	-	1036.50		830.50	-	951	-	-	-	-	-
4	Pandurang - Solapur	-	1471.13	397.09	1039.16	366.13	569.01	467.75	-	1454.61	2177.34	-	2980
5	Shri Shankar-Solapur	-	B. 1400	-	B-800 L-453.70	-	B-352.65 L-170.58	-	B-248.91 L-72.94	-	B-1530.93 L-854.92	-	-
6	Vikas-Latur	-	1200	-	750	-	1225	-	350	-	2200	-	-

44. In this context, MEDA submitted its response/comments vide letter dated November 21, 2009 as under:

- a. Having declared the first tariff order on bagasse cogeneration vide Order dated August 16, 2002, there has been no revision in tariff till now. The rise in per MW cost of project (including modernization cost) and subsequent increase in selling price of bagasse has made the present tariff structure unattractive and unviable.
- b. The rise in cost of generation has been assessed by MEDA by collecting the relevant details from a few sugar factories. The rise in cost of generation for last few years indicate that the average cost of generation through cogeneration in sugar factories is close to Rs. 5/- per unit.
- c. Due to low sugarcane availability and increased demand of bagasse in other activities, viz., fuel in process industry and paper industry, biomass power projects, etc., has raised the cost of bagasse. The average cost of bagasse in last two years is around Rs.2000 to Rs.3100/ tonne. The details in this regard could be obtained from the office of Sugar Commissioner, Pune.
- d. The increased sale price of bagasse is affecting the growth of cogeneration since selling bagasse is becoming a more attractive proposition than using it as a source for energy generation.
- e. In light of the above, it is proposed that the cogeneration tariff should be a two-part tariff instead of single part as applicable today. This will provide the fixed and variable components separately, making the tariff more reliable and acceptable for the sustainability of cogeneration projects.
- f. Further, it is proposed that for cogeneration projects some kind of indexation mechanism for variable charge component be introduced so that need for automatic revision in cogeneration tariff on account of variation in bagasse price parameters can be easily addressed.
- g. It is proposed that the revised tariff for cogeneration may be determined as per the CERC guidelines for RE tariff that stipulates indexation formula for tariff fixation in such matters.
- h. The policy benefits could get discontinued or curtailed at any time and will not be co-terminus with the tariff order duration. Further, it may happen that the benefits may come later after order is declared. In view of this, it is proposed that the policy benefits may not be considered while determining the tariff.

- i. In view of above and considering the power shortage in the State, it is felt necessary to give greater impetus to this sector. It is therefore proposed that the Commission may provide an interim tariff of Rs. 5 per unit till the regular tariff is declared after assessing the fixed and variable charge component with indexation mechanism.

45. Subsequent to the hearing, CAOI gave a written submission vide its letter dated November 24, 2009, wherein it reiterated its submissions made during the hearing. As regards price of bagasse and formulation thereof, CAOI submitted that the cost of saved bagasse, and procured bagasse/biomass for off-season operations should be similar to the market costs. The average bagasse price in the last sugar season was Rs 2000/tonne and fairly in line with the biomass costs suggested by CERC and MEDA. CAOI prayed that the bagasse cost should be kept variable and indexed to the average cost as informed by the Commissioner of Sugar or recommended Competent Authority. Alternately, the bagasse cost may be indexed to the coal price index or average sugarcane price declared by the sugar mills in Maharashtra. Apart from actual project costs being incurred, avoided cost of the saved bagasse and market price of bagasse, the CERC (Terms and Conditions for tariff determination from Renewable Energy Sources) Regulations, 2009 can be applied for tariff determination.

46. CAOI further submitted that the proposed tariff should be applicable for both existing and proposed EPAs. Around 21 bagasse based co-generation projects are operational and have long term EPAs of 13 years. With present variable cost, their operations are unviable and they need to either exit the EPA or stop operations. CAOI requested the Commission to classify the EPAs into three parts, broadly done earlier in the Tariff Order for wind energy, as below:

- a. EPAs signed before the proposed Order and plants already commissioned and operating for more than 3 years
- b. EPAs signed before proposed Order but either not commissioned or operating for less than 3 years
- c. EPAs to be signed after the proposed Tariff Order.

47. CAOI further submitted that the Commission may consider providing variable cost relief for the first type, variable cost relief including partial fixed cost relief for the second type and applicability of proposed direction to the third type. It further prayed that based on average project cost of Rs 5.5 Crore per MW and bagasse cost of Rs 2000/tonne, the project viability or financial closure can happen at tariff of about Rs 5.50/unit, which is in line with the offers from the traders. CAOI prayed to the Commission to provide similar or higher tariff to enable EPAs of cogeneration projects with MSEDCL and to ensure that these

renewable energy projects do not later need to approach the Commission to exit from non-viable EPAs.

48. Further, CAOI submitted its response to queries raised by the Commission during the hearing as under:

- a. **Alternate usage of bagasse:** Saved bagasse of sugar mills finds alternate market as economical substitute for coal in process industries and as source of fibre for Paper and Pulp industries.
- b. **Efficiency of bagasse cogen:** CERC (Terms and Conditions for tariff determination from Renewable Energy Sources) Regulations, 2009, considers station heat rate of 3600 kcal/kWh for cogen projects. This results in rewarding efficient bagasse cogeneration and de-motivating inefficient utilisation of bagasse.
- c. **Indexation of bagasse cost:** The same could be indexed to sugarcane price as it is a by-product of sugarcane or could be indexed to coal price index as it plays the role of solid fuel.
- d. **Motivation of sugar mills to install grid connected cogen plants:** Globally, to sustain cane farming costs, it is essential to maximise returns from the cane crushed. The cane crushed provides the cane juice used to manufacture sugar. The residual cane juice or molasses is distilled to manufacture alcohol or ethanol. The bagasse can be efficiently combusted to meet all the steam and power needs of sugar and alcohol manufacturing and also export 70-80% of power generated in season. The modern sugar complex consists of efficient sugar factory integrated with distillery and grid connected cogeneration plant. For existing sugar mills to compete with modern sugar complex and provide competitive and sustainable cane price, it is essential for them to modernise along with installing grid connected co-generation projects.
- e. **Market based Tariff vis-a-vis Feed-in tariff:** The co-operative structure of the sugar mills in Maharashtra does not lead to financial accruals. The entire revenue received from sale of sugar and other produce, less expense, is distributed as cane price. The sugar mills are totally dependent on external debt and equity bridge financing for new projects. In this scenario, long term EPA with escrow account provides comfort level to bankers.

49. The Commission observes that the Petitioner has neither provided any statistics, computations of cost of generation nor any supporting documents for the operational cogeneration projects in order to substantiate the cost of generation. Even the proposed options for formulation for bagasse price have not been substantiated through illustration based on historical and/or current price data for sugarcane price or coal price as proposed by the Petitioner. Further, the Commission observes that as per submissions of Commissioner of Sugar, it has furnished bagasse price data (**Table-2**) only in case of 6 co-generation projects (during FY 2008-09, bagasse price is reported only for 4 cogeneration projects) out of 21 co-generation projects already commissioned and operational within the State. Further, the range of bagasse prices as reported for 4 co-generation projects during FY 2008-09 varies significantly from Rs 854.92/tonne (Shri Shankar, Solapur) to Rs 1454/tonne-Rs2177/tonne (Shri Pandurang, Solapur), to Rs 1924 /tonne (Shri Someshwar, Pune), to Rs 2200/tonne (Shri Vikas, Latur). Thus, relying on un-audited information based on limited number of projects with wide variation may not be prudent.

50. Nonetheless, the Commission has noted the Petitioner's submission that present circumstances are exceptional and due to scarcity in availability of various types of biomass fuels including bagasse, as observed during proceedings of Case No. 83 of 2009 as well. The Commission has noted MSEDCL's submission that it has no objection to the proposed revision in variable charge component for bagasse/non-fossil fuel based cogeneration projects and generation from such renewable energy sources needs to be promoted. The Commission also notes that the detailed investigations and findings of the study report from M/s Gokhale Institute of Economics & Politics, Pune shall be available by February 2010.

51. The Commission has already initiated the process for comprehensive review of renewable energy sources for the new Control Period envisaged to be put in place with effect from April 1, 2010. A draft Discussion Paper on the subject has proposed a bagasse/biomass fuel price indexation mechanism and formula thereof, which can be firmed up after undertaking due regulatory process thereof. Hence, the present order and bagasse fuel price for the purpose of this Order shall be valid only till March 31, 2010.

52. As regards the issues of Station Heat Rate, revision in capital cost norms, etc., the Commission is of the view that these are performance parameters for which norms have been stipulated. Any modification in the same will amount to a wholesale revision, which is not the subject matter of the present matter and would also involve larger Regulatory Process. Hence, in this Order, revision in variable charge component of the Tariff only on account of fuel price variation has been dealt with.

53. Further, the Commission wishes to highlight that its earlier Tariff Order dated August 16, 2002 for qualifying co-generation projects is applicable for **non-fossil fuel based co-generation** projects including bagasse, and **not just for bagasse based co-generation** projects. Further, since price of fuel is derived based on 'equivalent heat value' approach under the said Order, the concerns regarding differences in calorific value of biomass (approx 3200-3300 kCal/kg) to that of bagasse (approx 2250 kCal/kg) are appropriately addressed. Thus, variable cost of generation for non-fossil fuel based co-generation projects irrespective of type of fuel, i.e., bagasse or any other type of biomass, remains the same.

54. As regards applicability or revision of tariff for non-qualifying co-generation projects are concerned, the Commission observes that separate dispensation for such non-qualifying co-generation project cases has been dealt with under separate Order dated May 25, 2005 (Case 26 of 2004). The pricing philosophy adopted for such non-qualifying cogeneration projects with the linkage to average power purchase cost of (the then) MSEB as prevalent at that time with appropriate escalation factor, has been elaborated under the aforesaid Order and is not the subject matter under the present Petition. Besides, the Petitioner has not made out any specific case of non-qualifying cogeneration projects with any supporting documents for its claim for revision in tariff for non-qualifying co-generation projects. Hence, under the present Order, the Commission has dealt with revision of tariff **only for** qualifying co-generation projects as earlier dealt with under its Order dated August 16, 2002. The Commission would also like to highlight that the applicability of the said Tariff Order was further extended vide its Order dated August 16, 2006 (Case No. 6 of 2006).

55. Having heard the Parties and upon scrutiny of the submissions placed on record, the Commission rules as under:

56. The revision in variable charge component on account of revision in biomass/bagasse fuel prices will have to be undertaken strictly in accordance with the provisions as outlined under the Tariff Order dated August 16, 2002 and upon undertaking due regulatory process in accordance with the provisions of EA 2003 and MERC (Conduct of Business) Regulations, 2004. However, in order to ensure that co-generation projects continue to operate and inject power into the grid, which is the need of the hour considering power shortage and load shedding prevalent within the State, the Commission is of the view that a revision in the Tariff Order is necessary for the period till March 31, 2010, i.e., the tenure of the existing approved tariff. The tariff for the subsequent period would be determined after due regulatory process as a part of the comprehensive review of Renewable Energy sources being undertaken separately by the Commission.

57. The Commission has analysed the Petitioner's submissions and other materials placed on record by Commissioner (Sugar) and MEDA in this context, while formulating the Order.

58. In its earlier Tariff Order dated August 16, 2002, the Commission determined the tariff for the purchase of electricity by the distribution licensees from the co-generation projects based on any non-fossil fuel (such as bagasse, biomass, biogas, agriculture waste such as rice husk, groundnut shells, etc.) as Rs. 3.05 per kWh for the first year of operation of the Co-generation project, with the tariff being escalated at the rate of 2% per annum on compounded basis, which amounts to a tariff of Rs. 3.50 per kWh during FY 2009-10, as shown in the Table below. The above tariff stream was based on bagasse price assumption of Rs 559/tonne during FY 2002-03 escalated at 8% per annum.

Table 3: Tariff and Bagasse Price as per Order dt. 16th Aug 2002

Year	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Tariff (Rs./unit)	3.05	3.11	3.17	3.24	3.30	3.37	3.43	3.50
Bagasse price (Rs/T)	559	604	652	704	761	821	887	958

59. Further, the Tariff under said Order was determined pursuant to assessment of Cost of Generation of three representative co-generation projects, namely, M/s Globe Co-generation Power Ltd. (Rs 3.05 per unit), M/s Vaidyanath Sahakari Sakhar Karkhana Ltd (Rs 2.73 per unit), and M/s Pravara Power Pvt Ltd (Rs 3.32 per unit). The table given below shows the fixed cost and variable cost computations based on submissions made by the Parties as summarised under Order dated August 16, 2002. Further, under the aforesaid Order, the Commission has also highlighted the distinction between the three projects, differences in configuration, project capacities, composition of power and steam generation, etc., resulting in differences in per unit fixed cost and per unit variable cost of power generation across the three co-generation projects under consideration.

60. Further, it can be observed from the Table below that the average per unit fixed cost, average per unit variable cost and average per unit cost of generation for the three cogeneration project cases for the first year of operation works out to be Rs. 2.26 per unit, Rs. 0.77 per unit and Rs. 3.03 per unit, respectively.

Table 4: Summary of fixed, variable and Total Cost of Generation during first year

Name of the Co-generation project	Per Unit Fixed Cost (Rs./unit)	Per Unit Variable Cost (Rs./unit)	Per Unit Total COG (Rs./unit)	Ref. Cogen Order dt. August 16, 2002
M/s Globe Co-generation Power Ltd	2.49	0.56	3.05	Ref. Schedule 1.1 at Page 75 of Order
M/s Vaidyanath Sahakari Sakhar Karkhana Ltd	1.77	0.96	2.73	Ref. Schedule 2.1 at Page 77 of Order
M/s Pravara Power Pvt. Ltd	2.52	0.80	3.32	Ref. Schedule 3.1 at Page 79 of Order
Average	2.26	0.77	3.03	

61. For ascertaining the prevalent average cost of fuel in the absence of any audited fuel cost data, the Commission has followed the same philosophy as adopted earlier in its Tariff Order dated December 14, 2009, in Case No.- 83 of 2008 and continued with the approach of 'equivalent heat value' for ascertaining the prevalent price of bagasse.

62. The weighted average cost of fuel for biomass projects as considered in Case No. 83 of 2008 is Rs. 2605 per tonne with corresponding gross calorific value (GCV) of 3200 kcal/kg. For non-fossil fuel based cogeneration using bagasse with gross calorific value (GCV) of 2250 kcal/kg, the proportionate weighted average cost of bagasse works out to Rs. 1832 per tonne, based on the Formula: Price of Bagasse = Price of Biomass x GCV of bagasse / GCV of biomass (i.e. Rs 1832/tonne = Rs 2605/tonne x 2250 kcal/kg / 3200 kcal/kg)

Table 5: Calculation for Variable Cost of Generation

	Weighted avg price of fuel (Rs./Tonne)	Variable Cost of Generation (Rs. /unit)
As considered in Order dated August 16, 2002	559	0.77
As considered in Case No 123 of 2008	1832	2.53

63. Thus, the Commission has determined revised variable charge component of tariff for cogeneration project as **Rs 2.53/unit** = Earlier Variable Cost of Generation as per Order dt. August 16, 2002 (Rs 0.77/unit) x Revised bagasse price (1832 Rs./Tonne) / Earlier Bagasse fuel price as per Tariff Order dated August 16, 2002 (Rs 559/Tonne) = Rs 0.77/unit x Rs 1832/Tonne / Rs 559/Tonne). The fixed charge component of tariff shall remain the average of the three power projects under consideration in the abovementioned Tariff Order for non-fossil fuel cogen power project **at Rs 2.26 per unit**.

64. **Thus, with effect from the date of this Order till March 31, 2010, the variable charge component for the non-fossil fuel based cogeneration power projects in the State of Maharashtra shall be Rs 2.53/unit. The fixed charge component of tariff shall remain at Rs 2.26 per unit. Thus, for the non-fossil fuel based cogeneration power projects, the total Tariff works out to Rs 4.79/unit from the date of issuance of this Order till March 31, 2010.**

With these observations and rulings, the Petition filed by CAOI, and the Intervention Applications filed by M/s Yash Agro and M/s Renuka Sugars are disposed off.

(V. L. Sonavane)
Member

(S.B. Kulkarni)
Member

(V. P. Raja)
Chairman



(Sanjay Sethi)
Secretary, MERC