GUJARAT ELECTRICITY REGULATORY COMMISSION

Gandhinagar

Order No. 4 of 2013

In the matter of: Determination of Tariff for Procurement of Power by the Distribution Licensees and Others from Biomass based Power Projects and Bagasse based Co-generation Projects.

In exercise of the powers conferred under Sections 61(h), 62(1)(a) and 86(1)(e) of the Electricity Act, 2003 and all other powers enabling it on this behalf, the Gujarat Electricity Regulatory Commission (hereinafter referred to as "the Commission") determines the tariff for procurement of power by Distribution Licensees and Others in Gujarat from biomass based power projects and bagasse based co-generation projects.

This order on biomass based power projects and bagasse based co-generation projects is the culmination of an elaborate consultative process after considering the suggestions received from various stakeholders.

1. BACKGROUND

1.1 Potential for Biomass Power and Bagasse Co-generation Projects

The potential assessment study carried out by the Ministry of New and Renewable Energy (MNRE) indicates grid connected biomass power potential and bagasse co-generation potential in the order of 1014 MW and 350 MW respectively. The installed capacity of grid connected biomass based power projects in the state is 31.2 MW; all of which were commissioned during the control period of previous tariff order dated 17 May 2010 and 7 February 2011. The state does not have operational grid connected bagasse based co-generation project as on date.

1.2 GERC Multi Year Tariff Regulations, 2011

The Commission had notified Regulation No. 1 of 2011 titled GERC (Multi Year Tariff) Regulations, 2011 on 22 March, 2011, which is applicable for determination of tariff to all existing and future Generating Companies, Transmission Licensees, Distribution Licensees, and their successors, if any. It is through the framework of this Regulation that the Commission shall determine tariffs for various cases including supply of electricity by a

Generating Company to a Distribution Company, intra-state transmission of electricity, intra-state wheeling of electricity, retail supply of electricity, etc. Further, it is within the norms of this regulation and broad principles given in the Tariff Policy notified by GoI, the tariff for procurement of power from biomass based power projects and bagasse based co-generation projects by the Distribution Licensees and others under discussion is determined.

1.3 Renewable Purchase Obligation in Gujarat

The 'Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) Regulations, 2010', (Notification No. 3 of 2010) dated 17 April 2010 has specified the minimum renewable power purchase obligation (RPO) by the obligated entities for the financial year 2012-13 at 7%. Out of this obligation, 0.5% RPO is to be met through energy generated from biomass, bagasse co-generation and other RE projects.

This renewable purchase obligation applies to Distribution Licensees as well Captive and Open-Access users consuming electricity (i) generated from conventional Captive Generating Plant having capacity of 5 MW and above for his own use and/or (ii) procured from conventional generation through open access and third-party sale. Based on this regulation, all obligated entities shall purchase electricity (in kWh) from renewable energy sources at a minimum percentage of the total consumption of their consumers including transmission and distribution (T&D) losses during a year.

Further, this regulation recognises the Renewable Energy Certificates (RECs) issued within the scope of Central Electricity Regulatory Commission's (CERC) Notification No. L-1/12/2010-CERC dated 14 January 2010 as a valid instrument for the discharge of the mandatory RPO set out in this regulation for the obligated entities.

1.4 GERC Biomass Tariff Orders 2010 and 2011

The GERC, in its Order No. 5 of 2010 dated 17 May 2010, determined generic tariff for procurement of power by Distribution Licensees and others from biomass based power projects with water-cooled condensers for the state of Gujarat. Subsequently, GERC vide its order dated 07 February 2011 on petition no. 985 of 2009 determined generic tariff for biomass based power projects using air-cooled condensers for the state of Gujarat. After due public consultation and regulatory process, GERC determined a two-part tariff for the biomass based power projects commissioned during FY 2010-11 to FY 2012-13.

The fixed cost component of tariff was levelised over the life of the project and the variable component of tariff was worked out separately for each year considering 5% annual escalation in fuel cost over the tariff period. Apart from that, the developers were given an option of choosing a single levelised tariff for two sub-periods starting from the project commissioning to the 10th years and from the 11th year to the 20th year. As the biomass projects were allowed to account for the accelerated depreciation (AD) benefit, tariff with AD benefit and tariff without AD benefit have been specified in each case.

The control period of the GERC, Order No. 5 of 2010 dated 17 May 2010 was up to 31 July 2013. In view of the initiation of the regulatory process for determination of tariff for biomass based power projects for the next control period, the Commission vide its Order No 2 of 2013, dated 31 May 2013 has extended the control period of GERC Order no 5 of 2010 up to 31 July 2013.

1.5 GERC Bagasse based Co-generation Tariff Order 2010

The GERC, in its Order No. 4 of 2010 dated 31 May 2010, determined the tariff for procurement of power by the Distribution Licensees and others from bagasse based co-generation projects for the state of Gujarat. The fixed cost component of tariff was levelised over the life of the project and variable component of tariff was worked out separately for each year considering 5% annual escalation in fuel cost over the tariff period. Also, developers have the option to choose a single levelised tariff for two sub-periods starting from the project commissioning to 10th years and from 11th year to 20th year. The tariffs were specified with AD benefit and without AD benefit also**.**

The control period of the GERC, Order No. 4 of 2010 dated 31 May 2010 was up to 31 July 2013. In view of the initiation of the regulatory process for determination of tariff for bagasse based co-generation projects for the next control period, the Commission vide its Order No 3 of 2013, dated 31 May 2013 has extended the control period of GERC Order no 4 of 2010 up to 31 July 2013.

1.6 GERC Discussion Paper on Determination of Tariff for Biomass Based Power Projects and Bagasse based Co-generation Projects

The Commission prepared a discussion paper on "Determination of Tariff for Procurement of Power by Distribution Licensees and others from Biomass based Power Projects and Bagasse based Co-generation Projects for the state of Gujarat" during the new control period starting from 1 August 2013, which was placed on the website of the Commission on

24 June 2013 for inviting comments and suggestions. The list of stakeholders who have filed their objections and suggestions is given in Annexure-I.

1.7 Public Hearing

A public hearing was held on 26 July 2013 to hear the stakeholders' views/suggestions /objections on the discussion paper. The list of those who participated in the hearing and expressed their views is given in Annexure-II.

2. DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER FROM BIOMASS BASED POWER PROJECTS AND BAGASSE BASED CO-GENERATION PROJECTS

2.1 Tariff Determination Methodology

The Commission has determined the biomass based power projects and bagasse based co-generation projects tariff based on the broad principles contained in the (i) GERC (Multi Year Tariff) Regulations, 2011, (ii) GERC (Procurement of Energy from Renewable Sources) Regulations, 2010 and (iii) CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012.

2.2 Process of Determination of Tariff

The Tariff Policy notified by the Central Government in pursuance of Section 3 of the Electricity Act, 2003 stipulates that the appropriate Commission may determine preferential tariff for procurement of power by distribution licensees from non-conventional sources of energy. The relevant extract of para 6.4 of the tariff policy is given 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 1 April 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".

The Commission noted that the 'Report on Policies on Renewable' prepared by the Working Group constituted by the Forum of Regulators consisting of Chairpersons of some of the State Electricity Regulatory Commissions and external experts, including a representative from the MNRE has recommended preferential tariff for renewable sources at least during their loan tenure. The report urges the Ministry of Power, Government of India, to frame guidelines and standard bid documents for competitive bidding for renewables under Section 63 of the Act.

The Commission also noted that the Ministry of Power has constituted a committee in February 2012 to accelerate development of renewable energy through legislative changes and to evolve competitive bidding guidelines for procurement of power from renewable energy under Section 63 of the Act. The competitive bidding guidelines are yet to be notified by the Ministry of Power, GoI.

In view of the above, and on the basis of the written comments/suggestions received from the stakeholders on the discussion paper on "Determination of Tariff for Procurement of Power by Distribution Licensees and others from Biomass based Power Projects and Bagasse based Co-generation Projects for the state of Gujarat" published by the Commission, as well as those received during the public hearing held on 26 July 2013, the Commission decides to continue with the cost-plus methodology adopted in the previous tariff orders issued by the Commission during the years 2010 and 2011 for determination of tariff for procurement of electricity from biomass based power projects and bagasse based co-generation projects by the distribution licensees in the state during the next control period starting from 1 August 2013.

2.3 Preferential Tariff

Clauses 6.4(1) and 6.4(2) of the Tariff Policy provide that the State Electricity Regulatory Commissions shall fix minimum percentage of power purchase from non-conventional energy sources, taking into account availability of such resources in the region and determine the preferential tariff for non-conventional energy sources. Distribution companies may procure such energy at preferential tariff determined by the State Commission or through competitive bidding process for future requirements. The Working Group constituted by the Forum of Regulators (FOR) for Policies on Renewable has in its recommendations suggested that a cost-plus tariff based on reasonable norms should be adopted for renewable energy (RE). Keeping in view provisions of the Tariff Policy, the recommendations of the Working Group of FOR, and larger objectives with reference to climate change and global warming, the Commission has adopted an approach of

determination of 'preferential tariff' on cost-plus basis for procurement of power generated from biomass based power projects and bagasse based co-generation projects by the distribution licensees and others.

With regard to the structure and design of the tariff, the following two approaches can be considered for the tariff determined on cost-plus basis.

i) Single-Part Tariff vs Two-Part Tariff

In case of renewable power projects, single-part tariff is adopted for the technologies where no fuel cost component is involved whereas two-part tariff is adopted for the technologies having fuel cost component. In the case of biomass based power projects and bagasse based co-generation projects, biomass and bagasse are used as a fuel for generation of power. Hence, the variable cost i.e. fuel cost is linked to the generation. Therefore, the Commission has decided to adopt two-part tariff for procurement of electricity from biomass based power projects and bagasse based co-generation projects by the distribution licensees and others in the state.

Commission has decided to adopt a two-part tariff approach for procurement of electricity from biomass based power projects and bagasse based co-generation projects by the distribution licensees and others in the state.

ii) Project Specific Tariff vs Generic Tariff

Considering the small capacities and diverse ownership of the biomass based power projects and bagasse based co-generation projects, the Commission decides to determine a generic tariff, rather than go for a project specific tariff on case-to-case basis. However, in case of biomass based power projects based on technologies other than Rankin cycle based technology, the Commission will determine a 'Project specific tariff' on case-to-case basis. Determination of project specific tariff for procurement of electricity from such projects shall be in accordance with such terms and conditions as stipulated in the relevant orders of the Commission.

Tariff Design

The generic tariff in this order is determined on levelised basis. Fix cost component has been levelised over the useful life of biomass based power projects and bagasse based co-generation projects, whereas variable cost tariff has been specified for the period of the control period defined in this order. For the purpose of computation of levelised tariff,

discount rate has been considered as per the approach adopted by Central Electricity Regulatory Commission.

2.4 Computation of Tariff

2.4.1 General Principles

a. Control Period

The Commission in the discussion paper has proposed the control period from 1 August 2013 to 31 March 2016.

Suggestions of the Objectors

No suggestions were received from the stakeholders about the duration of the control period.

Commission's Decision

For long-term regulatory certainty to the investors, and in order to make the control period coterminous with the financial year, the Commission decides to retain the control period as proposed in the discussion paper from 1 August 2013 to 31 March 2016.

b. Useful Life of Plant and Tariff Period

The Commission in the discussion paper has proposed a useful life of 20 years and the tariff period of 20 years for the biomass based power project and bagasse based co-generation projects to be commissioned during the new control period starting from 1 August 2013.

Suggestions of the Objectors

Some of the objectors have suggested considering 15 years as life of biomass power plants as high erosion of boiler surface reduces the life of boilers.

Commission's Decision

The CERC under 'RE Tariff Regulations 2012' has recommended 20 years as useful life of biomass based power projects and bagasse based co-generation projects for tariff determination purpose. The Commission had also considered 20 years as useful life of biomass based power projects and bagasse based co-generation projects in its earlier tariff orders. Further, the Commission has decides to keep the tariff period equal to the project

life. In view of the above, the Commission decides to retain the useful life and tariff period of biomass based power projects and bagasse based co-generation projects as 20 years.

c. Tariff Structure & Design

The Commission in its discussion paper had specified that the biomass based power projects and bagasse based co-generation projects commissioned during the next control period starting from 1 August 2013, shall be eligible to sell electricity to distribution licensees in the state as per the two-part tariff determined by the Commission. Fixed component of tariff shall be levelised over the life of the plant. Variable cost component of tariff shall be specified separately for the 3 years of the control period by considering annual fuel cost escalation of 5% during the control period. At the end of control period, the Commission shall re-determine the variable component of tariff based on prevalent market conditions; which will be specified in the subsequent tariff orders to be issued by the Commission. All biomass based power projects and bagasse based co-generation projects commissioned during the control period of present tariff order (1 August 2013 to 31 March 2016) will be eligible for getting the variable component of tariff as per the subsequent tariff orders of the Commission.

Suggestions of the Objectors

M/s. Abellon Clean Energy Limited suggested that in case the re-determination of variable cost component is delayed after completion of the present control period, the escalation of 5% on the variable cost to be continued till the new changes comes into effect. M/s. ACEL also submitted that the developers should be allowed an option/choice to exit from the PPA without any penalty if the tariff structure changes from two-part tariff to single-part tariff, or if the clause for escalation on variable cost is removed.

Commission's Decision

The Commission decides to adopt the two-part tariff approach for procurement of electricity from biomass based power projects and bagasse based co-generation projects. Further, it has been decided that the fixed component of tariff will be levelised over the life of plant and the variable component will be re-determined at the end of control period. As regard the contentions of the objector for 5% increase in the variable cost after the completion of the control period till the fixation of new variable tariff, the Commission agrees to the suggestion. Further, for the projects commissioned during the control period

of this order, the two-part tariff determination process shall be continued for the entire life of the project.

d. Eligibility Criteria

The Commission in its discussion paper has specified that biomass based power project based on rankine cycle technology, gasification technology and bagasse/non-fossil fuel based co-generation projects using new turbine generators and associated auxiliaries, to be commissioned after 1 August 2013 and during the control period of this tariff order will be eligible to sell power to distribution licensees of Gujarat at tariff determined by the Commission under the new tariff order. Further, bagasse/non-fossil fuel based co-generation projects to be commissioned during the control period starting from 1 August 2013 will have to fulfil the minimum efficiency qualification requirements as given below:

Qualifying criteria for bagasse based co-generation/non-fossil fuel based co-generation projects

A project may qualify to be termed as a bagasse based co-generation project/non-fossil fuel based co-generation project, if it is in accordance with the definition specified by the Ministry of Power and also meets the qualifying requirement outlined below.

I. Ministry of Power, GoI in its resolution dated 6 November 1996 has defined co-generation as: "A Co-generation facility is defined as one, which simultaneously produces two or more forms of useful energy such as electrical power and steam, electric power and shaft (mechanical) power etc."

II. Topping cycle mode of co-generation: Any facility that uses non-fossil fuel input for the power generation and also utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously.

III. Provided that for the co-generation facility to qualify under topping cycle mode, the sum of useful power output and one-half the useful thermal output be greater than 45% of the facility's energy consumption, during the season.

Explanation

a) 'Useful power output' is the gross electrical output from the generator. There will be an auxiliary consumption in the co-generation plant itself (e.g. the boiler feed pump and the FD/ID fans). In order to compute the net power output it would be

necessary to subtract the auxiliary consumption from the gross output. For simplicity of calculation, the useful power output is defined as the gross electricity (kWh) output from the generator.

b) 'Useful thermal output' is the useful heat (steam) that is provided to the process by the co-generation facility.

c) 'Energy consumption' of the facility is the useful energy input that is supplied by the fuel (normally bagasse or other such biomass fuel).

Suggestions of the Objectors

Some of the objectors including GBEDA have suggested that the cost of fuel and hence the variable tariff considered in the earlier order is comparatively lower than the fuel cost and variable tariff proposed in the discussion paper for the new control period. They submitted that there are only three biomass based power projects commissioned in Gujarat during the control period of earlier order which are not operating due to higher variable costs, they may be covered under the new tariff for the control period starting from 1 August 2013. Further, GEDA has also submitted that the three commissioned biomass based projects may be brought under the proposed tariff order in addition to the project likely to get commissioned post 1 August 2013.

Commission's Decision

The Commission decides to retain the eligibility criteria as specified in the discussion paper for procurement of electricity by distribution licensees and others from biomass based power projects and bagasse based co-generation projects as per the tariff specified in this order.

Revision of the tariff for the biomass based power projects commissioned during the control period of the previous tariff order is not a subject matter of the present regulatory process. The present tariff order is for determination of generic tariff for the biomass based power projects and bagasse based co-generation projects meeting the qualification criteria specified by the Commission in the discussion paper and to be commissioned during the control period starting from 1 August 2013 to 31 March 2016.

As regards the suggestion to extend the tariff determined by the present order to the existing projects, the matter can be dealt with separately and not as a part of this order.

e. Scheduling of Power

Generation from biomass based power projects and bagasse based co-generation projects is predictable and hence, the Commission proposed to cover these projects under the ambit of intra-state ABT order during the next control period. However, it was also proposed that biomass based power projects and bagasse based co-generation projects having installed capacity up to 4 MW and selling power to GUVNL/DISCOMs or wheeling the energy for captive use or IPPs selling to third-party consumers shall not be covered under the provisions of intra-state ABT mechanism in view of their smaller size and difficulties of monitoring by SLDC.

Suggestions of the Objectors

Some of the objectors submitted that scheduling of biomass based power project is difficult considering the variability of biomass fuel, calorific value, moisture content etc. CERC has kept the biomass based power plants of less than 10 MW capacities out of the ambit of scheduling and dispatch code. They submitted that biomass plants up to 10 MW should be exempted from intra-state ABT order or a variation should be allowed in the scheduled power generation up to 30%. M/s. IL&FS Renewable Energy Limited suggested to consider biomass based power projects of more than 15 MW instead of 4 MW for scheduling exemption as discussed in the discussion paper. M/s. Ankur Scientific Energy Technologies Pvt. Ltd. had requested to clarify that the proposed exemption in scheduling for projects of capacity below 4 MW is generic in nature and will the same be applicable to the existing projects along with the applicability of intra-state ABT order.

Commission's Decision

Generation from biomass based power projects and bagasse based co-generation projects is predictable and hence, those projects should come under the ambit of GERC Terms and Conditions of Intra-State Open Access) Regulations, 2011 as well as GERC ABT orders. The exemption from scheduling requirements for the smaller capacity biomass based power projects having installed capacities up to 4 MW has been kept considering their smaller size and difficulties of monitoring by the SLDC. As regards the suggestion to extend the benefit of exemption from scheduling to the existing projects, the matter can be dealt with separately and not as a part of this order.

f. Applicability of Merit Order Despatch Principle

The Commission in its discussion paper has proposed that biomass based power projects and bagasse based co-generation projects irrespective of the plant capacity shall be treated as 'MUST RUN' power plants and shall not be subjected to merit order despatch principle.

Suggestions of the Objectors

M/s. Gujarat Urja Vikas Nigam Ltd. (GUVNL) suggested that the biomass based power projects and bagasse based co-generation projects should be subject to merit order despatch principle.

Commission's Decision

Considering the nature of power projects, their size and as a promotional measure the Commission decides to give "Must Run Status" to the biomass based power projects and bagasse based co-generation projects. Further, merit order dispatch principle shall not be made applicable to such projects.

g. Interconnection point and Metering point

In the discussion paper the Commission has specified the interconnection point at the line isolator on outgoing feeder on HV side of generator transformer and the metering point at the interconnection point of the generator bus-bar with the transmission or distribution system concerned, as the case may be.

Suggestions of the Objectors

GETCO suggested change of the location of interconnection and metering points to the GETCO substation end. GETCO further submitted that, the developers may be asked to pay for maintenance charges for the dedicated lines starting from biomass based power projects to the GETCO substation and the same should not be cross subsidized by other distribution companies and ultimately the consumers of Gujarat.

Commission's Decision

The Commission has defined interconnection point and metering point as per the provisions under CERC RE Tariff Regulations 2012. The Commission decides to continue the provisions of interconnection point as discussed in the discussion paper. As a State Transmission Utility, GETCO is responsible to build, maintain and operate intra-state transmission system.

2.4.2 Operational and Financial Parameters

The following operational and financial parameters have been considered while determining generic tariff for biomass based power project and bagasse based co-generation projects under the cost-plus approach.

a. Capital cost

b. Power Evacuation System cost

c. Operations & Maintenance Charges

d. Plant Load Factor (PLF)

e. Auxiliary Consumption

f. Station heat rate

g. Gross Calorific Value of Fuel

h. Cost of Fuel including fuel mix and type

i. Debt-Equity Ratio

j. Loan Tenure and Rate of Interest on Term Loan

k. Depreciation

l. Working Capital and Interest on Working Capital

m. Return on Equity

n. Discount Rate

a. Capital Cost

i) Biomass based power projects using rankine cycle technology: In the discussion paper the Commission had listed the main cost components of biomass based power project as (i) boiler, (ii) turbine and generators, (iii) condenser, (iv) control cabinets, (v) chimney for flue gases, (vi) transformer and associated equipments, (vii) land and its development, (viii) processing fee of Gujarat Energy Development Agency (GEDA), (ix)

erection and commissioning charges, (x) creation of evacuation system up to the interconnection point of State Transmission Utility. The above components can be grouped into four important categories i.e. (i) plant and machinery, (ii) land cost (iii) evacuation infrastructure and (iv) associated service charges.

The Commission had in its earlier biomass tariff order dated 17 May 2010 specified capital cost of Rs. 4.25 Cr/MW for biomass based power project using water-cooled condenser to be commissioned during the previous control period.

In order to arrive at benchmark capital cost for the biomass based power projects using water-cooled condenser, the Commission has analyzed the capital cost data of the biomass based power projects commissioned in Gujarat during the control period of previous tariff orders as well as the approach followed by CERC and SERCs while fixing benchmark biomass based power projects capital cost under FY 2012-13 and FY 2013-14 tariff orders. The Commission has also examined the capital cost of biomass based power projects commissioned in the state and registered with UNFCCC for availing CDM benefit. The Commission has also considered the capital cost related recommendations provided by MNRE and IREDA to CERC while finalizing the RE tariff Regulations 2012.

On the basis of the above exercise, the Commission had proposed a benchmark capital cost of Rs. 4.68 Cr/MW for the control period starting from 1 August 2013 for biomass based power projects using water-cooled condenser. For biomass based power project using air-cooled condenser the Commission had proposed benchmark capital cost as Rs. 4.98 Cr/MW for tariff determination purpose.

Suggestions of the Objectors

Most of the objectors have suggested to consider higher benchmark capital cost than proposed in the discussion paper. M/s. ACEL has suggested that the capital cost shall be fixed as Rs. 5.72 Cr/MW. They submitted that some biomass processing equipments like shredders, chippers are required for sizing of biomass. Further, due to its smaller size, per MW cost is higher than thermal plants. They submitted that RERC in its discussion paper for FY 2013-14 has considered capital cost for biomass based power projects as Rs. 5.22 Cr/MW.

M/s. IREL has submitted that biomass management plan is an important factor of capital cost. They suggested that the base capital cost, benchmark capital cost and associated inflation indices need to be reviewed. They have proposed the capital cost of the biomass

based power project being implemented with water-cooled condenser and air-cooled condensers as Rs. 7.50 Cr/MW and Rs. 7.90 Cr/MW respectively.

The Ministry of New and Renewable Energy (MNRE) in their written submission have proposed that the capital cost for biomass based power projects to be commissioned in new control period shall be fixed as Rs. 6.00 Cr/MW to Rs. 6.50 Cr/MW.

GUVNL submitted that benchmark cost considered by the Commission is on higher side and suggested to take the capital cost as a consolidated package cost obtained through competitive bidding.

Commission's Decision

The Commission has derived the capital cost benchmark for determination of generic tariff by considering a representative biomass based power project of 2-10 MW capacity. The Commission has carried out its own exercise and examined the trends of capital cost of biomass based power projects in national and international markets during the last control period before deriving the benchmark for the new control period. Though, all the cost components of biomass based power projects were not listed in the discussion paper, the Commission understands that the cost towards biomass processing equipments is an integral part of biomass based power project and hence there is no need to add the same separately. The Commission has considered the CERC/SERCs approach in this regard and also analyzed the capital cost of the biomass based power projects commissioned in the state and registered with UNFCCC for availing CDM benefit. The benchmark capital has been derived by considering an appropriate escalation factor over the base capital cost. The escalation factor considered is based on the weighted average growth rates of WPI of steel, and Electrical Machinery during the last control period.

In view of above, the Commission decided to fix the benchmark capital cost of Rs. 4.68 Cr/MW and Rs. 4.98 Cr/MW for biomass based power projects using water-cooled and air-cooled condenser respectively for determination of tariff in the control period starting from 1 August 2013.

ii) Biomass based power projects using gasification technology: The Commission in the discussion paper proposed that tariff for biomass gasification based power project would be equal to the tariff for water-cooled condenser based biomass power projects due to limited availability of data and operational experience of biomass gasification based power projects. The Commission is not inclined to determine a generic tariff for this

technology at this stage and would like to continue with its earlier approach to allow such projects to sell electricity to the utilities at the tariff determined for biomass based power projects using water-cooled condensers. However, if required, developers can approach the Commission with necessary supporting documents for project specific tariff determination.

Suggestions of the Objectors

There are no suggestions or objections received on the project cost for biomass based power projects using gasification technology.

Commission's Decision

The Commission decides not to specify any capital cost for the biomass based power projects based on gasification technology. These projects are allowed to sell electricity to the utilities at the tariff determined for biomass based power projects using water-cooled condensers. Further, if required, the developers can approach the Commission with necessary supporting documents for project specific tariff determination.

iii) **Bagasse based Co-generation Projects:** The capital cost components of bagasse based co-generation projects are similar to that of biomass based power project. The GERC in its tariff order dated 31 May 2010 has specified capital cost of Rs. 4.15 Cr/MW for bagasse based co-generation projects. In the discussion paper the Commission had proposed a benchmark capital cost of Rs. 4.57 Cr/MW for bagasse based co-generation projects to be commissioned for the control period starting from 1 August 2013.

Suggestions of the Objectors

M/s. Fortune Vision International has suggested the capital cost as Rs. 5.25 Cr/MW based on the enquiries received from the major equipment manufacturers. M/s. Gujarat State Federation of Co-operative Sugar Factories (GSFCSF) has proposed to consider the benchmark capital cost in line with the actual total capital cost which will include the required cost for modernisation of sugar factory also.

In the public hearing the Cogeneration association of India submitted to consider the capital cost including cost required to be incurred on essential modernization. In support of the capital cost they have submitted a draft report titled "Updation of cost ceiling benchmarks Biomass power and Cogeneration projects" prepared by MITCON for IREDA.

Commission's Decision

The Commission observed that in bagasse based co-generation project, the power project is set up in the premises of existing sugar factory, and hence such projects practically do not incur cost on procuring land for the project. Further, a part of steam and power generated in power generation project is used for processing of sugar. Hence, the cost of boiler and steam turbine cannot be fully loaded on the co-generation power plant's capital cost and needs to be apportioned appropriately.

In order to determine the benchmark capital cost, the Commission has studied the recent Bagasse Cogeneration tariff orders issued by CERC/SERCs. The Commission has referred to the capital cost data of bagasse based co-generation projects financed by IREDA during FY 2010-11 and FY 2011-12. The Commission noted that benchmark capital cost for biomass based power projects and bagasse based co-generation projects derived by MITCON in the draft report submitted to IREDA are based on the base cost of such projects fixed during the study conducted in year 2005-06 and the growth rates are derived by considering changes in wholesale price index of all commodities, inflation rate and steel price index in equal proportion.

The Commission while determining the benchmark capital cost for the bagasse based co-generation projects to be commissioned during the control period starting from 1 August 2013, has considered the appropriate growth rate based on the weighted average growth rate of WPI of steel and electrical machinery during the last control period over the base capital cost fixed earlier tariff order during 2010.

Considering the above facts, the Commission decides the benchmark capital cost of Rs. 4.57 Cr/MW for determination of tariff for the bagasse based co-generation projects to be commissioned in the control period starting from 1 August 2013.

b. Power Evacuation System

In the discussion paper, the Commission had proposed not to include the cost associated with laying of power evacuation line beyond interconnection point as a part of capital cost. The cost associated with erection of transformer, associated equipment and creation of evacuation system up to interconnection point is already included in the capital cost. GETCO was made responsible for laying the power evacuation line from the interconnection point to the nearest GETCO substation.

Suggestions of the Objectors

GUVNL submitted that, when GETCO has to undertake the work related to erection of evacuation line, the developers are making odd choices in finalising the location of project and mostly not near to the GETCO substations and thus adding difficulties to GETCO. Hence they submitted to follow the existing mechanism and ask the developers to directly erect the evacuation line and work out the tariff based on the capital cost inclusive of the evacuation cost.

GETCO in its submission stated that due to the problems like ROW, installation in remote places and the existing targets of GETCO for erection of substation and transmission lines, the developers may be asked to erect the transmission line up to the GETCO Substation. They further submitted that the length of the evacuation lines in the case of biomass based power projects is much longer and GETCO plans to evacuate it at 220/66 kV so that the system strengthening schemes are avoided to curtail the cost implications.

Torrent power submitted that the biomass based power projects are free to sell power to the consumers other than utility. Hence the licensee should not be asked to bear the cost of evacuation system as it would burden the other consumers. They further submitted that Hon Commission may specify the normative evacuation cost so that the project developers can opt for the optimum length of the transmission line. M/s. IREL had submitted that Commission may elaborate in detail the cost of laying the transmission line is to be borne by the DISCOM and shall not be recovered from the developer.

M/s. ACEL in their submission requested that the Commission should device suitable mechanism to reimburse the expenses incurred by the biomass based power project investors on construction of evacuation line in past during previous control period.

Commission's Decision

The Commission is of the opinion that the biomass based power projects and bagasse based co-generation projects have to lay comparatively shorter transmission lines than that of the wind power projects and the size of these projects is in the range of 1 MW to 15 MW. Hence, the Commission decides that GETCO/DISCOM shall erect the transmission line from the interconnection point to the nearest GETCO/DISCOM substation at its own cost.

The Commission further clarifies that the evacuation line related provisions specified under the present tariff orders shall be made applicable prospectively for the projects to be commissioned during the control period w.e.f. 1 August 2013. The biomass based power projects commissioned in the previous control period will be governed by the prevalent tariff orders of the Commission.

c. Operations & Maintenance Charges

In the discussion paper, the Commission had proposed to retain the O&M cost in line with its earlier orders on biomass based power projects and bagasse based co-generation projects for the new control period starting from 1 August 2013. However, as per the provisions under GERC MYT Regulations, the Commission had proposed the annual O&M escalation of 5.72% for biomass based power projects and bagasse based co-generation projects.

Suggestions from Objectors

Some of the objectors have suggested to consider higher O&M cost for biomass based power projects and bagasse based co-generation projects. M/s. Gujarat Biomass Energy Developers Association has proposed O&M cost as 9% of capital cost. Whereas, M/s. ACEL has submitted that labour cost, cost of biomass collection, transportation cost, processing cost etc are quite high in the state of Gujarat as compared to the other states. They have further proposed 7% of capital cost as O&M cost with 6% escalation. M/s. IREL has suggested the O&M cost as Rs. 35 Lakh/MW with 7% escalation.

GUVNL has submitted that the proposed O&M cost is on higher side. They have proposed O&M cost as 3%-4% of capital cost with 4%-5% escalation.

M/s. GSFCSF and Cogeneration Association of India have submitted that the actual O&M expenses are in the range of Rs. 25 Lakh/MW and the same will further increase upward due to general inflation & rise in wages & maintenance etc. and they requested to increase the O&M expenses.

Commission's Decision:

The Commission has carefully gone through the approach followed by the CERC and other SERCs while fixing the O&M cost for the purpose of biomass based power projects and bagasse based co-generation projects. The O&M cost of 5% of the capital cost of biomass based power project and 3% of the capital cost of bagasse based co-generation project will enable the developers to operate and maintain the biomass based power projects and bagasse based co-generation projects in efficient way. Therefore, the O&M costs proposed in the discussion paper are reasonable and hence the Commission decides to retain the same for the next control period. Also, the Commission decides to allow an annual O&M cost escalation at 5.72% per annum over the tariff period as per the provisions of the MYT Regulations 2011.

d. Plant Load Factor (PLF)

The Commission in its discussion paper had proposed to consider the PLF of 70% during the 1st year covering the stabilization period and 80% from the 2nd year onward for biomass based power projects. For bagasse based co-generation projects the Commission had proposed the PLF of 60% for determination of tariff for the next control period.

Suggestions of the Objectors

M/s. GBEDA and M/s. ACEL has proposed to consider 60% PLF in the first year and 70% from second year onwards for biomass based power projects. M/s. GUVNL has suggested to consider the usage of fossil fuel up to 25% so as to achieve 80% PLF. M/s. GSFCSF and Cogeneration Association of India have requested to consider the PLF of bagasse based co-generation projects as 53% as per CERC.

Commission's Decision

For analyzing the PLF of **biomass** based power projects, the Commission has considered the approach followed by CERC /SERCs in this regard. The Commission has also referred to the submission under the report titled 'Operating norms of biomass project report prepared by CEA. Considering all the facts the Commission decides to retain the PLF for biomass based power projects as 70% in the first year of operation and 80% from the second year onwards.

The PLF for **bagasse** based co-generation projects in the state has been proposed on the basis of analysis of operating data of sugar factories in Gujarat during crushing season for the last three years and hence the Commission decides to retain the PLF of 60% for bagasse based co-generation projects for the next control period starting from 1 August 2013.

e. Auxiliary Consumption

The Commission, in its discussion paper had proposed 10% of gross energy generation as auxiliary consumption for **biomass** based power projects using water-cooled and air-cooled condenser and 8.5% auxiliary consumption for **bagasse** based co-generation projects.

Suggestions of the Objectors

Some of the objectors have suggested to increase the auxiliary consumption of biomass based power projects due to its smaller size, use of biomass processing equipments and variation in fuel quality. They have suggested auxiliary consumption in the range of 12% to 15%. M/s. GBEDA has proposed auxiliary consumption of 12% for biomass based power projects using air-cooled condensers. M/s. IREL has also suggested higher auxiliary consumption for biomass projects based on air-cooled condenser.

M/s. GSFCSF has proposed actual auxiliary consumption of 10% to be considered for the purpose of tariff determination for bagasse based co-generation projects.

Commission's Decision

The Commission has considered the tariff order issued by CERC/SERCs and observed that most of the SERCs have specified 10% auxiliary consumption for **biomass** based power projects. Also, the Commission has noted that the CEA report on 'operating norm for biomass power projects', September 2005 has also recommended auxiliary consumption at 10%. The electricity consumption for biomass processing equipments has already been considered under auxiliary consumption. The issue of allowing higher auxiliary consumption for air-cooled condenser based biomass power projects was discussed in detail in the GERC order on Case No 985 of 2009 dated 07 February 2011 and the Commission did not find any reason to allow higher auxiliary consumption. Hence, the Commission decides to consider 10% auxiliary consumption for all types of biomass based power projects.

In case of **bagasse** based co-generation projects, the Commission noticed that the auxiliary consumption considered by most of the SERCs is in the range of 8% to 9%. CERC has also considered 8.5% auxiliary consumption under RE tariff Regulations 2012. Hence, the Commission decided to retain 8.5% auxiliary consumption for bagasse based co-generation projects.

f. Station Heat Rate (SHR)

The Commission in its discussion paper had proposed to consider the SHR of 3800 kCal/kWh for biomass based power projects using the water-cooled condensers and 3950 kCal/kWh for biomass based power projects using air-cooled condensers. In case of bagasse based co-generation projects the Commission had proposed the SHR of 3600 kCal/kWh.

Suggestions of the Objectors

Some of the objectors have suggested to consider SHR in the range of 3950–4900 kCal/kWh. M/s. ACEL has proposed to consider 4% higher SHR because 3800 kCal/kWh can be achieved only by 10 MW capacity biomass based power projects and smaller capacity projects have higher SHR. M/s. IREL has suggested to consider SHR of 4300 kCal/kWh and 4500 kCal/kWh for water-cooled and air-cooled condenser based biomass project respectively.

M/s. GSFCSF has proposed to consider SHR of bagasse based co-generation project as 4200 kCal/kWh.

Commission's Decision

The Commission has noticed that **biomass** developers have predominately used travelling grate type boilers for rankine cycle based biomass based power projects. The SHR of such projects varies in the range of 3400–3900 kCal/kWh. Most of the SERCs have also specified the SHR as 3800 kCal/kWh. RERC has specified a higher SHR for biomass projects. The Commission in the tariff order dated 07 February 2011 for biomass based power projects with air-cooled condenser had considered the SHR of 3950 kCal/kWh by recognizing the fact that the condenser pressure in such projects required to be kept at high level which resulted in higher SHR than the water-cooled condenser. While determining the SHR, it is essential to keep in mind that the plant operates efficiently and at the same time the consumers are not burdened with inefficient operation of plant. Considering the above facts, the Commission decides to retain the SHR as 3800 kCal/kWh and 3950 kCal/kWh for water-cooled condenser and air-cooled condenser based biomass projects respectively for tariff determination purpose.

For bagasse based co-generation projects, the Commission noticed that MPERC, TNERC and KERC in the recent bagasse based co-generation tariff orders have specified SHR as 3700 kCal/kWh; whereas, CERC in its tariff order for FY 2013-14 has considered SHR as 3600 kcal/kWh. Hence, the Commission decides to retain the SHR as 3600 kCal/kWh for bagasse based co-generation projects for tariff determination purpose.

g. Gross calorific value (GCV) of Fuel

Based on the data provided by the Directorate of Agriculture, Government of Gujarat (GoG) and the biomass resource assessment study conducted by the Indian Institute of Science,

(IISC) Bangalore, the Commission in its discussion paper had studied the type and quantity of surplus biomass available for in the state for power generation. The weighted average calorific value of representative surplus biomass was proposed as 3688 kCal/kg for determination of tariff for the next control period.
In case of bagasse, the Commission in its discussion paper had proposed the GCV of 2250 kCal/kg for determination of tariff for the next control period.

Suggestions of the Objectors

GUVNL submitted that apart from the cotton stalk there is a huge potential of groundnut and wheat pods which has the GCV of 4200 and 3800kCal/kg respectively. If both these biomass of 15% each considered along with the cotton stalk of balance 70% then the aggregate GCV comes to 3700 kCal/kg and hence requested to consider the GCV of biomass at 3700 kCal/kg. M/s. GBEDA had proposed to consider the GCV of biomass as 3300 kCal/kg.
M/s. IREL had submitted that due to seasonal availability of biomass it needs to be stored for longer period further the biomass get degraded due to weather changes and pests attack leading to reduction of heat value of biomass fuel. Further, due to difference in moisture content the GCV of biomass differs. M/s. IREL have submitted the laboratory test report of different biomass samples including Prosopis Juliflora collected in Gujarat. They have further submitted that CEA under the report 'Operating norms for biomass power project' and CERC have considered GCV of biomass as 3300 kCal/kg. They further submitted that biomass based power projects in Gujarat predominately uses cotton stalk and Prosopis Juliflora as the main fuel supported with one or two supplementary fuel in the form of agro residues of crops listed in discussion paper and hence request to consider the GCV of biomass as 3300 kCal/kg for tariff determination.

Commission's Decision

The Commission in its discussion paper had considered the weighted average GCV of representative surplus agro residues available in Gujarat for power generation. In order to examine the availability of forest/waste land biomass, the Commission once again looked into the matter and noted that the availability of forest/waste land biomass in the state is considerable and Prosopis Juliflora is one of the major forest biomass available in the state and it can be used as fuel in biomass based power projects.

Therefore, the Commission decides to consider the representative biomass consisting of equal proportion of surplus agro residue and Prosopis Juliflora available in the state.

Hence, the Commission decides to consider a normative GCV of representative biomass as 3400 kCal/kg for tariff determination purpose for the new control period. The normative GCV of 3400 kCal/kg as given above is arrived on the basis of GCV of representative surplus agro residue and that of Prosopis Juliflora after allowing appropriate reduction in GCV due to decay of biomass because of its storage, moisture contents etc.

In case of GCV of bagasse, the Commission decides to retain the GCV of bagasse as proposed in the discussion paper as 2250 kCal/kg for determination of tariff for the control period starting from 1 August 2013.

h. Cost of fuel

In the discussion paper the Commission had proposed to follow equivalent heat value approach for determination of cost of biomass. For this the Commission had considered the landed cost of coal at GSECL and Torrent thermal power plant during FY 2011-12 based on GERC truing-up tariff order of GSECL and Torrent Power for FY 2011-12. The cost of biomass on equivalent heat basis was worked to as Rs. 2726 per MT.

Further, in case of bagasse, the sugar factories do recover the cost of cane from their finished product i.e. sugar after adding the processing cost and profit margin. Hence, the by product i.e. bagasse is available at free of cost to the sugar factories. However, as bagasse has commercial value and in order to promote co-generation in sugar factories the Commission had proposed the cost of bagasse as 50% of the cost of sugar cane. In the discussion paper the Commission had proposed the cost of bagasse as Rs. 1289 per MT.

Suggestions of the Objectors

M/s. ACEL had submitted that the factors like collection of biomass, its price are at risk of fire, degradation of biomass, malpractice while collecting biomass, mixing of stones, sprinkling of water, and high presence of inorganic stuff in the biomass affects the quantity/quality of biomass and hence the losses of around 3.5% may be considered. Considering this they proposed the price of biomass as Rs. 2900 per MT.
M/s. GBEDA have submitted to consider the cost of biomass as Rs. 3479 per MT. They have further submitted that the price of biomass should be determined on annual basis based on the data from agencies like GEDA, TERI or any Agriculture University. There should be fuel cost pass through mechanism applicable for biomass based power projects. M/s. IREL have submitted that in the equivalent heat value approach, the landed cost of coal for power

stations in the state is low as they have coal linkages. They have further requested to consider the cost of biomass as Rs. 3500/MT with a normative escalation factor of 10% per annum. They have also requested to revisit the biomass fuel cost on half yearly basis instead of reviewing at the end of control period.

GUVNL submitted that the price of conventional fuel is highly volatile and availability of fuel is also a question and hence the same cannot be used as reference for biomass pricing. Further, the cost of transportation in case of coal is very high as compared to the cost of transportation in case of biomass and hence cost of biomass should be reduced. They have further submitted that GERC in its earlier order had considered cost of biomass as Rs. 1700 per MT and CERC had considered the cost of fuel as Rs. 2653 per MT. Hence they proposed to consider the cost of fuel as Rs. 2653 per MT.

M/s. GSFCSF had proposed to consider the cost of bagasse as Rs. 2500 per MT. The Cogeneration Association of India had submitted that the market price of bagasse had increased substantially in Gujarat and other states in last two years. The price of bagasse is in the range of Rs. 1800 to Rs. 2000 per MT as against the price of bagasse of Rs. 1289 per MT considered by the Commission. Many sugar factories in Gujarat have sold the saved bagasse at an average price of Rs. 2000 per MT in the last year and the same is likely to increase to Rs. 2500 per MT for the upcoming period and further proposed to increase the price of bagasse accordingly.

Commission's Decision

The Commission has analyzed the biomass cost data submitted by the projects already commissioned. The price of biomass procured by the biomass based power projects is through an unorganized market and there is lack of availability of authentic data. The GCV of biomass is affected by the moisture content, malpractices in procurement, leakages in transportation, inclusion of debris etc. and it is the responsibility of developer to procure the biomass of desired quality at appropriate price and quantity received at its doorstep. Though there is less transportation cost involved in transportation of biomass as compared to the transportation of coal, it should be understood that the Commission had considered the cost of coal procured through the long term contracts by the state utility.

In the absence of authentic data and reliable study on cost of biomass, the Commission decides to determine the price of biomass as per equivalent heat value method. The

Commission in the discussion paper has used the landed cost of coal for FY 2011-12 based on GERC truing-up tariff order of GSECL and Torrent Power for FY 2011-12. The Commission decided to determine the cost of biomass on equivalent heat value method by comparing it with landed cost of coal during FY 2012-13. The landed cost of coal during FY 2012-13 at GSECL and Torrent thermal power plant is worked out by using escalation factor of 5% as used in computation of variable component of tariff during the control period. Accordingly the Commission decides to consider the normative cost of coal and biomass as Rs. 2912 per MT and Rs. 2726 per MT respectively for tariff determination purpose during the control period starting from 1 August 2013.

In case of cost of determination of cost of bagasse, the Commission has analyzed the past three (FY 2009-10 to FY 2011-12) year's trend of cost of sugarcane in the state of Gujarat. The Commission has found that the cost of sugarcane was lower in the FY 2010-11 than that in of the previous year; and the same further increased in the FY 2011-12. In the discussion paper the Commission had considered the price of bagasse as 50% of the price of sugarcane.

As there is no consistent trend observed in the price of sugarcane over last three years, the Commission feels that determination of cost of bagasse on the basis of cost of sugarcane may affect the economics of bagasse based co-generation projects in the long term. Therefore, the Commission has decides to use the equivalent heat value approach as adopted in case of biomass based power projects.

Accordingly the Commission has decided to fix normative cost of bagasse as Rs. 1804 per MT for the purpose of tariff determination during new control period starting from 1 August 2013.

i. Debt-Equity Ratio

GERC Multi Year Tariff (MYT) Regulations 2011 provide for the normative debt-equity ratio of 70:30 for Generating Company/Licensees. Also, the recent CERC RE Regulations 2012 have considered the same debt-equity ratio for biomass based power projects and bagasse based co-generation projects. The Commission proposed the debt equity ratio as 70:30 in the discussion paper as considered in the previous tariff orders.

Suggestions of the Objectors

No suggestions were received from the stakeholders about the debt-equity ratio.

Commission's Decision

The Tariff Policy formulated by the Ministry of Power, Govt. of India, stipulates debt-equity ratio of 70:30 for power projects. GERC Multi Year Tariff (MYT) Regulations 2011 notified by the Commission also provide that the debt-equity ratio should be kept at 70:30. CERC has also specified debt-equity ratio as 70:30 in the RE Regulations 2012. Hence, the Commission decides to retain the debt-equity ratio as 70:30 for the new control period starting from 1 August 2013.

j. Loan Tenure and Rate of Interest on Term Loan

The Commission in its biomass tariff order dated 17 May 2010 and bagasse based co-generation tariff order dated 31 May 2010 had stipulated the loan tenure of 10 years. CERC in RE Tariff Regulations 2012 fixed the loan tenure as 12 years. In the discussion paper the Commission has proposed to continue its earlier practice of considering 10 years as loan tenure.

While considering the interest rate of loan, the Commission observed that the weighted average Base Rate of SBI for the period 1 April 2012 to 31 March 2013 was 9.86%. Further, the Commission noticed that the interest rate of IREDA for biomass based power project varies from 12.50% to 13.25% and for bagasse based co-generation projects varies from 11.90% to 12.50%. In view of this, the Commission had proposed to use the last one year weighted average base rate of SBI for the tariff determination purpose with a spread of 250 basis points above the current SBI base rate.

Suggestions of the Objectors

M/s. ACEL has suggested to consider interest rate as 565 basis point above current SBI base rate. M/s. GSFCSF has proposed interest rate as 13.5%. However, M/s. GUVNL has proposed to consider interest rate at 11.70% by considering the 200 basis point higher than current SBI base rate due to declining interest rates.

Commission's Decision

The Commission has noted that banks are now following the base rate system after the RBI guidelines. While all banks have their own base rates, the project financing interest rates are typically indicated by the SBI base rate. The Commission further noted that the SBI base rate was constant for over a year and then reduced from 20 September 2012. Therefore, to accommodate the recent changes in SBI base rate, the Commission decides to consider the weighted average base rate of FY 2012-13, which is 9.86%. Considering the submissions of

the stakeholders, the Commission decides to fix the interest rate as 12.86% which is SBI weighted average base rate for FY 2012-13 with a spread of 300 basis point.

k. Depreciation

CERC, in its CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 considered the capital cost of the asset admitted by the Commission as value base for the purpose of determination of depreciation. Further, the salvage value of the asset is considered as 10% and depreciation is allowed up to a maximum of 90% of the capital cost of the asset. Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure and the depreciation beyond loan tenure shall be computed over useful life on 'Straight Line Method' (SLM).

GERC, in its biomass tariff order dated 17 May 2012 and bagasse based co-generation tariff order dated 31 May 2010 had considered a higher rate of depreciation (6%) as a promotional measure during the loan tenure, and then the balance depreciation was spread over the remaining useful life. In view of this, in the discussion paper the Commission had proposed depreciation rate of 6% per annum for the first 10 years, and 3% from 11th to 20th year for tariff determination purpose.

Suggestions of the Objectors

M/s. ACEL has suggested considering depreciation as 7% for the loan tenure and remaining amount to be spread over remaining useful life.

Commission's Decision

GERC Multi Year Tariff (MYT) Regulations 2011 notified by the Commission specifies that depreciation rate should be calculated based on the Straight Line Method with a depreciation rate of 5.28% per annum. The MYT regulation further lays down that asset is to be depreciated up to 90% of its initial value (considering residual value as 10% of its initial value) over the entire asset life. As a promotional measure and to facilitate the loan repayment, the Commission has considered higher depreciation rate at 6% per annum during the loan repayment period of 10 years. The Commission decided to keep the depreciation rate as 6% per annum for the first 10 years, and 3% from 11th to 20th year for the purpose of tariff determination for new control period starting from 1 August 2013.

l. Working Capital and Interest Rate on Working Capital

The Commission in the discussion paper has proposed components of working capital for **biomass** based power projects as (i) fuel stock for 30 days, (ii) O&M expenses for one month, (iii) receivables equivalent to one month charges for sale of electricity and (iv) maintenance spare @ 1% on capital cost with escalation @5% p.a. after the first year. For **bagasse based co-generation** projects, the Commission has proposed the following components of working capital - (i) O&M expenses for one month, (ii) receivables equivalent to one month charges for sale of electricity and (iii) maintenance spare @ 1% on capital cost with escalation @5% p.a. after first year.

In the discussion paper, the Commission had considered interest on working capital equal to 50 basis points lower than that of interest on long term loan considering that the working capital is recurring and is required for a shorter time period. In the discussion paper, the interest rate on working capital was considered as 11.86%.

Suggestions of the Objectors

In the components of working capital, M/s. GUVNL has suggested to consider maintenance spares as 15% of O&M cost instead of 1% on capital cost in line with the provision made by CERC. Further, some of the objectors have suggested considering fuel stock for 3-4 month, receivables for 2-3 months and maintenance spares @ 2% of the capital cost for biomass based power projects. Some of the objectors have proposed to consider the interest on working capital as 14%. M/s. ACEL has requested to consider interest on working capital as base rate plus 550 basis point. M/s. IREL has submitted that working capital is required throughout the year and interest rate on working capital may be at par with interest on long term loan. M/s. GBEDA has submitted that fuel stock of minimum 3 months be considered while calculating the working capital requirement. They further requested to consider the receivables of two months for calculation of working capital requirement.

Commission's Decision

The Commission has proposed the 30 days' fuel stock and receivables for one month to provide necessary cash flow which will be incurred by the project developers during the operational period. The Commission is of the opinion that, 30 days of biomass stock is sufficient for successfully running the biomass power plants. Considering the monthly billing cycle followed in the state, it is sufficient to consider one month receivables by sale of electricity under working capital. So far as the maintenance spares @ 2% on capital cost are concerned, it is clarified that biomass based power projects and bagasse based co-generation projects are similar to conventional power plants. As per GERC Multi Year Tariff

(MYT) Regulations 2011, the requirement of maintenance spares is 1% on capital cost, hence maintenance spares @ 1% on capital cost is considered as a component of working capital. Therefore, as proposed in the discussion paper, the Commission decides to retain the same components of working capital for biomass based power projects and bagasse based co-generation projects.

Regarding interest on working capital, the Commission has considered the submissions made by the stakeholders and decides the interest rate on working capital as 12.86% which is at par with the interest rate on long term loan.

m. Return on Equity (RoE)

The equity base for computing return has been considered by the Commission as 30% of the project capital cost. If the equity employed by the project developer is more than 30%, the amount of equity for the purpose of determining the tariff will be limited to 30% only and the rest will be treated as notional loan. In case the equity employed is less than 30%, the actual equity employed will be considered. However, for determination of generic tariff for biomass based power projects and bagasse based co-generation projects, the Commission has proposed 30% of project cost as equity and return on the same has been calculated.

In line with the GERC Multi Year Tariff Regulations, 2011, the Commission in its discussion paper had considered RoE as 14% per annum. Further, the Commission had allowed MAT at the rate of 20.008% per annum for first 10 years and corporate tax at the rate of 32.445% per annum for the next 15 years.

Suggestions from Objectors

Some of the objectors have suggested that the RoE may be considered as 16% on post tax basis. M/s. GBEDA has suggested RoE as 18%. M/s. IREL has proposed to consider MAT @ 21% and corporate tax @ 33.99%.

Commission's Decision:

GERC Multi Year Tariff (MYT) Regulations 2011 notified by the Commission specify the RoE of 14%; the same was specified by the Commission in its discussion paper. The Commission follows the principle of allowing 14% RoE plus the applicable tax payment for conventional and renewable power projects. The Commission decided to consider RoE of 14% and the tax payment of MAT at the rate of 20.008% per annum for first 10 years and corporate tax

at the rate of 32.445% per annum for next 10 years as per the prevailing tax rates for projects to be commissioned during the control period starting from 1 August 2013.

n. Discount Rate

The Commission in its Discussion paper had calculated the annual levelised tariff based on the discount rate of 10.04% over 20 year life span. The CERC in RE Tariff Regulations 2012 had specified discount rate as post tax weighted average cost of capital (WACC).

Suggestions from Objectors:

M/s. IREL has suggested that the discount rate shall be considered as proposed by CERC for bid evaluation. However, they suggested to modify the formula by not factoring the tax rate in cost of debt as the formula is used for raising the invoices by the developers and not to rank the developers.

Commission's Decision

The Commission has used the discount rate formula given in CERC RE Regulations 2012 and considered the discount rate as post tax weighted average cost of capital (WACC).

Post tax WACC = Cost of Debt + Cost of Equity;

Where, Cost of Debt = normative debt x normative rate of interest x (1 – corporate tax rate) and Cost of Equity = normative equity x post tax return on equity.

The discount rate is used to calculate the levelised tariff over life of the project. The understanding of considering post tax WACC is while taking the investment decisions, the developer considers post tax WACC as the discount rate to post tax incremental cash flows to arrive at NPV of the project. Therefore, the Commission decides to retain the discount rate as 10.04% as proposed in the discussion paper.

2.4.3 Subsidy and Incentive by the Central/State Government

Benefit due to Accelerated Depreciation:

The Commission noted that Government of India had allowed biomass based power project and bagasse based co-generation project owners to avail accelerated depreciation at the rate of 80% in the first year on a written-down value (WDV) basis as per Section 32 and Rule 5 of the Income Tax Act. In addition to this 80% depreciation, the amendment in the

Finance Act 2012 allowed an additional depreciation of 20% to the power generation projects during their first year of commissioning. With this, the biomass based power projects and bagasse based co-generation projects can avail 100% depreciation in the first year of commissioning. The Commission therefore has proposed two tariffs, with and without accelerated depreciation benefit, for procurement of power by utilities from biomass based power projects and bagasse based co-generation projects.

Suggestions from Objectors:

M/s. ACEL has submitted that benefits provided by State/Central Government are for the project developers to promote this sector and therefore the subsidies need not be passed to anybody. They have requested to clarify the definition of beneficiaries.

Commission's Decision

The Commission has noted that the benefit of 20% depreciation is available during the first year along with the 80% depreciation available to the biomass based power projects and bagasse base co-generation projects. Therefore, biomass based power projects and bagasse base co-generation projects can avail 100% depreciation during the first year of project commissioning. The Commission also noted that the Regulation 22 of the CERC RE tariff Regulations 2012 states that

"…….(i) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and ***corporate income tax rate……"***

The Commission decides to calculate per unit benefit due to depreciation as per the above method. Further, the Commission decides to factor in the benefit of depreciation while calculating the tariff and specify a two-part generic tariff, with and without accelerated depreciation benefit, for procurement of power by utilities from biomass based power projects and bagasse based co-generation projects, for the control period starting from 1 August 2013.

The biomass based power project/bagasse based co-generation project owner opting tariff without accelerated depreciation benefit should submit an undertaking at the time of signing the PPA that AD benefit cannot be availed for the generating plant/unit. Thereafter, a certificate from a Chartered Accountant (CA) along with the income tax return filed with

Income Tax department indicating that AD benefit is not claimed need to be submitted to GUVNL/DISCOM.

3. Tariff Determination

Based on the foregoing discussion, the operational and financial parameters considered by the Commission for determination of biomass based power projects tariff are given in the table below:

Table 3.1: Benchmark parameters for tariff computation of biomass based power projects

Parameters	Biomass based Power Projects with Water-Cooled Condensers	Biomass based Power Projects with Air-Cooled Condensers
Project Cost and O&M		
Land + Plant & Machinery + Erection Cost (Rs. Lakh/MW)	468	498
Evacuation Infrastructure Cost (Rs. Lakh/MW)	Nil	Nil
Total Project Cost (Rs. Lakh/MW)	468	498
Normative O&M Cost for first year (Rs. Lakh/MW)	5% of project cost	5% of project cost
Escalation in O&M (per annum from 2nd year)	5.72%	5.72%
Performance Parameters		
CUF	70% for 1st year & 80% from 2nd year onwards	70% for 1st year & 80% from 2nd year Onwards
Auxiliary Consumption	10%	10%
Project Life in Years	20	20
Station Heat Rate kCal/kWh	3800	3950
Gross Calorific Value of Fuel kCal/kg	Biomass - 3400 and Coal - 3632	Biomass - 3400 and Coal – 3632
Cost of Fuel	Rs. 2726 per MT for biomass and Rs. 2912 per MT for coal	Rs. 2726 per MT for biomass and Rs. 2912 per MT for coal
Fuel Cost Escalation	5%	5%
Financial		

Parameters	Biomass based Power Projects with Water-Cooled Condensers	Biomass based Power Projects with Air-Cooled Condensers
Parameters		
Debt-Equity ratio	70:30	70:30
Term of Loan in Years	10	10
Interest on Term Loan	12.86%	12.86%
Interest on Working Capital	12.86%	12.86%
Depreciation	6% (up to 10 years) 3% (11 to 20 years)	6% (up to 10 years) 3% (11 to 20 years)
Minimum Alternate Tax	20.008%	20.008%
Corporate Income Tax	32.45%	32.45%
Return on Equity	14%	14%
Tariff	Tariff without AD benefit: Levelised fixed component of tariff - Rs. 1.77 /kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.39/kWh, FY 2014-15 -Rs. 3.55/kWh, FY 2015-16 - Rs. 3.73/kWh Tariff with AD benefit: Levelised fixed component of tariff - Rs. 1.49 /kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.39/kWh, FY 2014-15 -Rs. 3.55/kWh, FY 2015-16 - Rs. 3.73/kWh	Tariff without AD benefit: Levelised fixed component of tariff - Rs. 1.80 /kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.52/kWh, FY 2014-15 - Rs. 3.69/kWh, FY 2015-16 - Rs. 3.88/kWh Tariff with AD benefit: Levelised fixed component of tariff - Rs. 1.58 /kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.52/kWh, FY 2014-15 - Rs. 3.69/kWh, FY 2015-16 - Rs. 3.88/kWh

The operational and financial parameters considered by the Commission for determination of bagasse based co-generation project's tariff are given in the table below:

Table 3.2 : Benchmark parameters for tariff computation of bagasse based co-generation projects

Parameters	Bagasse based Co-generation Projects
Project Cost and O&M	
Land + Plant & Machinery + Erection Cost (Rs. Lakh/MW)	457
Evacuation Infrastructure Cost (Rs. Lakh/MW)	Nil
Total Project Cost (Rs. Lakh/MW)	457

Parameters	Bagasse based Co-generation Projects
Normative O&M Cost for First Year (Rs. Lakh/MW)	3% of project cost
Escalation in O&M (per annum from 2nd year)	5.72%
Performance Parameters	
CUF	60%
Auxiliary Consumption	8.5%
Project Life in Years	20
Station Heat Rate kCal/kWh	3600
Gross Calorific Value of Fuel kCal/kg	2250
Cost of Fuel	Rs. 1804 per MT for bagasse and Rs. 2912 per MT for coal
Fuel Cost Escalation	5%
Financial Parameters	
Debt-Equity Ratio	70:30
Term of Loan in Years	10
Interest on Term Loan	12.86%
Interest on Working Capital	12.86%
Depreciation	6% (up to 10 years) 3% (11 to 20 years)
Minimum Alternate Tax	20.008%
Corporate Income Tax	32.45%
Return on Equity	14%
Tariff	**Tariff without AD benefit:** Levelised fixed component of tariff - Rs. 1.86 /kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.15/kWh, FY 2014-15 - Rs. 3.31/kWh, FY 2015-16 - Rs. 3.48/kWh **Tariff with AD benefit:** Levelised fixed component of tariff - Rs. 1.54/kWh for 20 years And *variable component of tariff for FY 2013-14 - Rs.3.15/ kWh, FY 2014-15 - Rs. 3.31/kWh, FY 2015-16 - Rs. 3.48/kWh

*The biomass based power projects/bagasse based co-generation projects owner opting tariff without AD benefit should submit an undertaking at the time of signing the PPA that AD benefit cannot be availed for the

generating plant/unit. Thereafter, a certificate from a Chartered Accountant (CA) along with the income tax return filed with Income Tax department indicating that AD benefit is not claimed need to be submitted to GUVNL/DISCOM.

4. Other Commercial Issues

4.1 Transmission and Wheeling Charges

The Commission in its discussion paper had proposed to adopt the transmission and wheeling charges for the biomass based power projects and bagasse based co-generation projects availing open access (OA) in the new control period as per its respective earlier tariff orders. As per the earlier order, concessional transmission and wheeling losses were allowed for the biomass based power projects and bagasse based co-generation projects wheeling electricity below 66 kV level.

However, during the control period of the above biomass based power projects and bagasse based co-generation projects tariff order, the Renewable Energy Certificate (REC) mechanism was introduced in India in January 2010. As per the provisions of the CERC REC Regulations, biomass based power projects and bagasse based co-generation projects installed for captive use are allowed to avail RECs on total generation including self-consumption, provided such projects forego the concessional transmission and wheeling charges/losses and other benefits offered by the state Government/SERCs. In view of the above development, the Commission while proposing to retain the transmission and wheeling charges and concessions as specified in its earlier tariff order dated 17 May 2010, 2 February 2011 and 31 May 2010 have further clarified that the biomass based power projects and bagasse based co-generation projects availing open access for captive use/third-party sale and willing to register under REC mechanism shall be governed as per CERC REC Regulations in force.

Suggestions from Objectors

GUVNL submitted that as per as per the GERC intra-state Open Access Regulations, open access is provided for the loads above 1 MW for which voltage level is 11 kV and above and wheeling of power at voltage below 11 kV is not allowed. However, if the intra-state OA for biomass based power projects and bagasse based co-generation projects below 11 kV is to be allowed, then the present OA charges and losses are much lower than the actual. GUVNL has suggested for revision of the wheeling charges to 15 Paise/kWh for wheeling power at 11 kV and 43 Paise/kWh for wheeling power below 11 kV. The wheeling losses proposed

by GUVNL are 10% for wheeling power at 11 kV and 16.77% for wheeling power below 11 kV. GUVNL further submitted to allow the DISCOMs to recover the normal OA charges. Torrent power has submitted that the discussion paper is silent on the wheeling and transmission charges to be recovered from biomass based power projects and bagasse based co-generation projects registered under REC and selling to third-party or having captive use. As the captive and third-party open access transactions are commercial propositions, and that should be treated at par with other consumers or else the burden of giving financial benefits to such commercial propositions is to be borne by other retail consumers by paying higher retail tariff. Further, it submitted that any relaxation from recovery of wheeling charges may be contrary to the provisions of Section 42 of the EA 2003 and hence the biomass based power projects and bagasse based co-generation projects wheeling power for captive use or for third-party sale shall be treated at par with the normal OA consumers by levying normal OA charges. M/s. ACEL had requested to consider the transmission and wheeling loss at 6% of the energy fed in to the grid and they further requested to allow the same to third-party sale also.

Commission's Decision

The Commission recognizes the fact that the cost of transmission/distribution assets created for evacuation of power from any generating project should be recovered to, a reasonable extent, from such generators. Otherwise, it will amount to cross-subsidizing such generators by other consumers. As such, the Commission decides that the transmission and wheeling charges applicable to captive users as well as third party sale shall be as proposed in the discussion paper, which is as under:

(a) Wheeling of power to consumption site at 66 kV voltage level and above

The wheeling of electricity generated from the biomass based power projects to the desired location(s) within the State shall be allowed on payment of transmission charges and transmission losses applicable to normal Open Access Consumer.

(b) Wheeling of power to consumption site below 66 KV voltage level

(i) The wheeling of electricity generated from the biomass based power projects, to the desired location(s) within the State, shall be allowed on payment of transmission charges, applicable to normal Open Access Consumer and transmission and wheeling loss @ 10% of the energy fed to the grid. The above loss is to be shared between the transmission and distribution licensees in the ratio of 4:6.

(ii) The wheeling of electricity generated by small investors, having capacity of below 4 MW in the State, to the desired location(s), shall be allowed on payment of transmission charges, applicable to normal open access consumer, and transmission and wheeling losses @ 7% of the energy fed to the grid. The above losses are to be shared between the transmission and distribution licensees in the ratio of 4:3. Biomass based power generation plant owners, who desire to wheel electricity to more than two locations shall pay 5 paise per unit on energy fed in the grid to the Distribution Company concerned in whose area power is consumed in addition to above mentioned transmission charges and loses, as applicable.

(c) Injection at 11 kV and drawl at 11 kV and below voltage level When the point of injection and drawl at 11 kV or below voltage level lies within the same distribution area, the user shall bear wheeling loss at 6% and pay wheeling charges at 5 paise per unit.

The biomass based power projects and bagasse based co-generation projects availing open access for captive use/third-party sale and willing to register under REC mechanism shall be governed as per CERC REC Regulations in force.

4.2 Cross-Subsidy Surcharge

The Commission in its discussion paper had proposed to exempt from the cross-subsidy surcharge (CSS) to captive as well as third-party sale of electricity from biomass based power projects and bagasse based co-generation projects. In order to promote renewable energy projects, the Commission proposed to continue the same practice during the new control period.

Suggestions from Objectors

GUVNL has submitted that, the benefit of exemption from CSS may be given to third-party sale of electricity from biomass based power projects and bagasse based co-generation projects. Torrent Power has also requested to remove the concession granted to the third-party sale transactions for payment of CSS as these are the commercial propositions. They have further submitted that the Electricity Act has exempted captive consumers only from payment of CSS and hence the exemption may not be granted to third part sale.

Commission's Decision

The Commission decides to continue the exemption from cross-subsidy surcharge for open access transactions of biomass based power projects and bagasse based co-generation

projects selling to third-party or making captive use and not availing REC benefit as a promotional measure during the new control period starting from 1 August 2013.

The Commission clarifies that the cross-subsidy surcharge will be applicable in the case of third-party sale availing REC benefit.

4.3 Energy Metering

In the discussion paper it was proposed that developers of biomass based power projects and bagasse based co-generation projects shall provide energy metering and communication facility in accordance with the following regulations/codes/orders and their subsequent amendments.

1) Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010
2) Gujarat Electricity Grid Code 2004 and its subsequent amendments
3) GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments
4) GERC Distribution Code 2004 and its subsequent amendments

However, for the purpose of energy accounting, such projects shall have to provide ABT compliant meters at generators and if the power is to be wheeled to consumer's premises, then ABT compatible meter is to be installed at the consumer premises also.

Suggestions from Objectors

M/s. Ankur Scientific Energy Technologies Pvt. Ltd. has submitted that, as the power plant upto 4 MW are proposed to be exempted from scheduling and intra-state ABT mechanism; they should also be exempted from ABT compliant meters as it is not required.

Commission's Decision:

In order to have uniformity in metering standards irrespective of the installed capacity of power generation projects, the Commission directs that biomass based power projects and bagasse based co-generation projects should install ABT compliant meters at the point of metering. The ABT meter shall conform to the Central Electricity Authority (Installation and Operation Meters) Regulations, 2006. The project developers will have to install

Remote Transmitting Unit (RTU) for transferring the real time data to SLDC for its monitoring purpose.

4.4 Pricing of Reactive Power

In the discussion paper it was proposed that biomass based power projects and bagasse based co-generation projects shall have reactive energy charges at par with that of other renewable energy generation sources. Hence, the reactive energy tariff approved by the Commission for the RE technologies like wind and solar shall be made applicable to biomass based power projects and bagasse based co-generation projects.

Suggestions from Objectors

The Commission has not received any suggestions on the issue of pricing of reactive power.

Commission's Decision

Export of reactive power does not always help the transmission network as it is linked with the level of voltage at the time of such export into the grid. Incremental impact of overall prices on reactive energy charges will be discussed in the Commission's transmission tariff order. Any change in the reactive energy charges for biomass based power projects and bagasse based co-generation projects if addressed in the Commission's transmission tariff order effective from time to time shall be made applicable to biomass based power projects and bagasse based co-generation projects. The Commission specifies the present rate of the reactive energy charges for biomass based power projects and bagasse based co-generation projects as follows:

"10 paise/kVARh – For the drawl of reactive energy at 10% or less of the net energy exported.

25 paise/kVARh – For the drawl of reactive energy at more than 10% of the net active energy exported".

4.5 Contract Demand for Commissioning/Start-up Power

Suggestions from Objectors

M/s. ACEL submitted that the biomass based power projects need substantial power for cold start/black start. Such projects require two start ups every month and average 10 MW size biomass based power project consumes approximately 10,000 units/month. They requested that the Commission should consider to allow them power withdrawal permission at zero contract demand on net metering basis. The DISCOM may charge at per

unit basis for the energy drawn for commissioning/start up at UI rates applicable. The GEDA in its submission contended that the power imported by such projects during the shutdown/maintenance period and synchronization period from grid may be settled on net metering basis.

Commission's Decision

The Commission has analysed the submissions made by the objectors. Further, the expenses related to the start-up power are to be met through the pre operative expenses of the projects i.e. through the approved capital cost for the project. Further, the expenses related to the standby power need to be met through the allowed operation and maintenance expenses. The number of shut downs, maintenance downtime and hence the standby power requirements can be minimized by efficient operation of the power plant. Hence, the Commission is of the opinion that no such expenses due to the inefficient operation be further allowed over and above the approved operation and maintenance charges.

Biomass based power projects need power supply during the initial start-up of the project and as a standby power during its operation to support the equipments in case of tripping or shut downs. However, in case of bagasse based co-generation projects, the requirement of standby power is met through the existing power supply available for the sugar factory. Hence, the Commission decides the provisions related to start-up power and standby power as follows:

Start-up power and Standby power: The biomass based power projects selling electricity to GUVNL/DISCOM as per the tariff specified by the Commission in this order or wheeling electricity through open access, the energy charges for the start-up power and standby power shall be at par with that of the energy charges applicable to the HT industrial consumer of similar connected load/category. Further, as a promotional measure such projects shall be exempted from the demand charges. These charges shall be reviewed after the completion of the control period of this order.

4.6 Sharing of Clean Development Mechanism (CDM) Benefits

In the discussion paper, the Commission proposed to retain the provisions for sharing of CDM benefits in line with the recommendations made by the Working Group on Renewable Energy Generation constituted by the Forum of Regulators for the next control period. However, such projects availing CDM benefit shall share the net CDM proceeds annually, by

31 March of every year with an affidavit stating the annual energy generation (date of commissioning as starting point of the first year), CER generated, gross receipts, and net receipts.

Suggestions from Objectors

M/s. ACEL had submitted that the benefits from CDM have decreased over the past few years but the overall fixed cost for applying and availing the CDM benefits has not decreased proportionately. The price of CER in May 2010 was around 15 Euro/CER and now it has reduced to 0.5 Euro/CER in 2013. They have further requested the Commission to remove this sharing of CDM benefit clause as these benefits are negligible. Further, the techno-commercial decision whether to avail the CDM or not should be the sole decision of project developer and the same should not be imposed by GUVNL/DISCOM.

Commission's Decision

The price of CER is linked to the market and is likely to increase or decrease depending on the market forces. As this benefit is over and above the tariff the same need to be passed on the end consumer. The Commission further clarifies that it will be the sole responsibility of the project developer to apply for the CDM benefits based on the techno-commercial decision. Hence, the Commission decides that the sharing of net proceeds on account of CDM benefits realized through sale of CER generated from corresponding annual energy generation from biomass based projects and bagasse based co-generation projects shall be as follows:

- 100% of net proceeds through sale of CER generated from the energy generation in the first year after the date of commercial operation of the project shall be retained by the developer.

- In the second year, the share of the beneficiary shall be 10% which shall be progressively increased by 10% every year till it reaches 50% in the sixth year; thereafter the proceeds shall be shared in equal proportion by the power generating company and the beneficiary.

Biomass based projects and bagasse based co-generation projects availing CDM benefit shall share the net CDM proceeds annually as per above, by 31 March of every year with affidavit stating the annual energy generation (date of commissioning as starting point of the first year), CER generated, gross receipts, and net receipts.

4.7 Banking of Surplus Energy

Biomass based power projects and bagasse based co-generation projects generate power with controlled supply of fuel and hence the power generated from such projects can be predicted and scheduled to maintain grid discipline. Hence, such projects are required to schedule their power. In the discussion paper, the Commission did not allowed any banking facility to biomass based power projects and bagasse based co-generation projects either selling power to third-party or wheeling for self-use.

Suggestions from Objectors

M/s. ACEL submitted that, biomass based power projects are in the nascent stage and need support for sustained operation. Such projects require power for cold start/black start. The proposed to allow one month banking facility to biomass based power projects in line with that of other RE sources like solar and wind.

Commission's Decision

Biomass based power projects and bagasse based co-generation projects operate with controlled supply of fuel and hence the power generated from such projects can be predicted and scheduled in line with loads. Hence, the Commission decides to not allow any banking facility to biomass based power projects and bagasse based co-generation projects either selling power to third-party or wheeling for self-use.

4.8 Purchase of Surplus Power from Biomass based Power Projects and Bagasse based Co-generation Projects Opting for Captive Use and Third Party Sale Under Open Access.

The financial charges on account of any deviation from scheduled generation shall be governed by the provisions of the intra-state ABT Order, of the Commission, in force. In the discussion paper it was proposed to continue the same treatment for purchase of un-settled surplus power from captive or third-party sale of electricity generated from biomass based power projects and bagasse based co-generation projects for the next control period.

Suggestions from Objectors

GUVNL submitted that in case of captive and third-party sale of power from biomass based power projects and bagasse based co-generation projects, the power surplus after the

settlements and injected into grid can be controlled. Hence, the DISCOMs may not be impressed to pay for any energy inadvertently injected in to the grid over the scheduled injection.

Commission's Decision

The surplus power over and above the settlement as per schedule given by the captive users and those opting for third-party sale of power from biomass based power project and bagasse based power projects of 4 MW and above capacity shall be treated as per the provisions under the intra-state ABT order in force.

4.9 Renewable Energy Certificates for Third-Party Sale and Captive Use of Power Generated from Biomass based Power Projects and Bagasse based Co-generation Projects

In the discussion paper it was proposed that the power generated from biomass based power projects and bagasse based co-generation projects, if wheeled to third-party or for captive use, will be eligible for availing the Renewable Energy Certificates under the CERC REC mechanism. The accreditation and registration of biomass based power projects and bagasse based co-generation projects under REC mechanism shall be as per the CERC REC Regulations 2010 and its subsequent amendments if any.

Suggestions from Objectors

On the issue of availability of REC to third-party and captive sale of electricity, GUVNL has requested to specifically clarify if the biomass based power project is set up in REC mode and opted for sale of power to third-party then such project will have to forgo the concessional transmission and wheeling charges/losses, payment of CSS and other benefits provided by state Govt.

Commission's Decision

The Commission has specified the concessional treatment for wheeling of power generated from biomass based power projects and bagasse based co-generation projects at specified voltage level below 66 kV. However, the qualification of the biomass based power projects and bagasse based co-generation projects opting for captive use or third-party sale of electricity and registering in the REC mechanism in case they avail any concessional benefits is governed by the CERC REC Regulations and its amendments if any, and the same

shall also be applicable to the biomass based power projects and bagasse based co-generation projects commissioned in Gujarat.

4.10 Security Deposit

In the discussion paper the Commission had proposed to retain the provision of security deposit of Rs. 5 Lakh/MW to GETCO in the form of bank guarantee to assure GETCO about the project developer's seriousness in developing the project. Further, it was proposed that in case of default in setting up the project within 4 years from the date of sanction of the power evacuation line the said amount shall be forfeited by GETCO.

Suggestions from Objectors

GUVNL submitted that, GETCO may be allowed to forfeit the security deposit submitted by the project developer if the developers failed to commission the project within 6 months after commissioning of transmission line or within the control period whichever is earlier. As laying of transmission line/network by GETCO entails huge investment which should inevitably fetch the returns, GUVNL submitted that the recovery of transmission charges should start immediately upon the scheduled date of commissioning irrespective of whether the project is operationalized or not.

In addition to this GUVNL submitted that the developers are entering into PPA with GUVNL/DISCOM and later on backing out from commitment. They further requested to provide for submission of security deposit to the tune of Rs. 20 Lakh/MW in favor of GUVNL/DISCOM so as to enable them to recover the liquidated damages from the non sincere developers.

Commission's Decision

The Commission has considered security deposit of Rs. 5 Lakh/MW to GETCO in line with its earlier tariff order. The Commission decides to continue the same for the new control period. Considering the size and potential of biomass based power projects and bagasse based co-generation projects, the Commission do not find any justification for making such developer to pay an additional security deposit of Rs. 20 Lakh/MW to GUVNL/DISCOM.

4.11 Monitoring Mechanism for the use of Fossil and Non-fossil fuel

In the discussion paper the Commission has proposed to retain the provisions related to monitoring mechanism for the use of fossil and non-fossil fuel in the biomass based power projects and bagasse based co-generation projects for the new control period.

Suggestions from Objectors

GUVNL has submitted that in case the biomass based power project uses fossil fuel more than the permissible limit then, the Commission may specify a penalty equivalent to 1.5 times of additional cost paid by distribution licensees for sourcing RE from alternate sources.

Commission's Decision

In order to ensure that the use of fossil fuel is within the prescribed limit, the Commission has nominated the Gujarat Energy Development Agency (GEDA) as the nodal agency for monitoring the usage of fossil fuel by the biomass based power projects. Accordingly, the Commission has prescribed the following:

Fuel usage statement

[A] The project developer shall furnish a monthly fuel usage statement and monthly fuel procurement statement duly certified by Chartered Accountant to the procurer and the nodal agency for each month, along with the monthly energy bill. The statement should cover details, such as:

i. Quantity of fuel (in tonnes), gross calorific value (in kCal/kg) and moisture content (in percentage) for each fuel type (biomass fuel and fossil fuel) consumed and procured during the month for power generation purposes,
ii. Cumulative quantity (in tonnes) of each fuel type (biomass fuel and fossil fuel) consumed and procured till the end of that month during the year,
iii. Actual (gross and net) energy generation (denominated in units) during the month,
iv. Cumulative actual (gross and net) energy generation (denominated in units) until the end of that month during the year,
v. Opening fuel stock quantity (in tones),
vi. Receipt of fuel quantity (in tonnes) at the power plant site and,
vii. Closing fuel stock quantity (in tonnes) for each fuel type (biomass fuel and fossil fuel) available at the power plant site.

Non-compliance to the condition regarding limited use of fossil fuel, during any financial year shall result in withdrawal of "Preferential tariff" as per this order for such biomass based power project.

[B] **Information system for creation of Database**

It is necessary to create data-base for further review of the technical/financial parameters for next tariff order. Therefore, project developers shall have to keep records of the following items and provide the same to GEDA and the Commission annually to create data-base for future.

i. Number and categories of employees for different purposes.
ii. Administrative and General Expenses.
iii. Repair and Maintenance work carried out during the year specifying activities carried out with time period and spare/material replaced and its cost.
iv. Details of Spare parts of the plant/machines replaced during the year with justification and cost.

5. Applicability of the Order

This order shall be effective from 1 August, 2013. The tariff determined by the Commission in this order shall be applicable to all the biomass based power projects and bagasse based co-generation projects commissioned on or after 1st August, 2013. The GUVNL/DISCOM shall revise PPA, if already signed with the biomass based power projects and bagasse based co-generation project owners who commission their projects on or after 1 August 2013 in accordance with the provisions of this order.

Sd/-	Sd/-	Sd/-
Dr. M. K. Iyer	**Shri Pravinbhai Patel**	**Dr. P. K. Mishra**
Member	Member	Chairman

Place: Gandhinagar

Date: 08/08/2013

Annexure I

List of Stakeholders who have submitted written suggestions/objections on the Discussion Paper.

Sr. No	Name of Stakeholder
1	Abellon Clean Energy Limited. (ACEL)
2	Ankur Scientific Energy Technologies Pvt. Ltd.
3	Cogeneration Association of India
4	Fortune Vision International
5	Gujarat Biomass Energy Developers Association (GBEDA)
6	Gujarat Energy Development Agency (GEDA)
7	Gujarat Energy Transmission Corporation Ltd. (GETCO)
8	Gujarat State Federation of Co-operative Sugar Factories (GSFCSF)
9	Gujarat Urja Vikas Nigam Ltd
10	IL&FS Renewable Energy Limited
11	Ministry of New and Renewable Energy (MNRE)
12	Torrent Power Ltd.

Annexure II

List of stakeholders, who have attended the public hearing on 26 July 2013.

Sr. No	Name of Stakeholder
1	Abellon Clean Energy Limited. (ACEL)
2	Ankur Scientific Energy Technologies Pvt. Ltd.
3	Cogeneration Association of India
4	Fortune Vision International
5	Gujarat Biomass Energy Developers Association (GBEDA)
6	Gujarat Energy Development Agency (GEDA)
7	Gujarat Energy Transmission Corporation Ltd. (GETCO)
8	Gujarat State Federation of Co-operative Sugar Factories (GSFCSF)
9	Gujarat Urja Vikas Nigam Ltd
10	IL&FS Renewable Energy Limited(IREL)
11	Torrent Power Ltd.

Annexure III

Tariff for biomass based power project with water-cooled condenser

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	55.19	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07
Costs																				
O&M	23.40	24.74	26.15	27.65	29.23	30.90	32.67	34.54	36.52	38.60	40.81	43.15	45.61	48.22	50.98	53.90	56.98	60.24	63.69	67.33
Depreciation	28.08	28.08	28.08	28.08	28.08	28.08	28.08	28.08	28.08	28.08	14.04	14.04	14.04	14.04	14.04	14.04	14.04	14.04	14.04	14.04
Interest on term loan	40.02	35.81	31.60	27.38	23.17	18.96	14.75	10.53	6.32	2.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	6.16	6.98	7.24	7.51	7.81	8.11	8.44	8.79	9.15	9.54	9.84	10.32	10.82	11.35	11.90	12.48	13.09	13.74	14.41	15.12
Return on Equity	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66	19.66
Tax on equity	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Fixed cost (Rs lakh)	121.25	119.20	116.66	114.22	111.88	109.65	107.53	105.53	103.66	101.92	90.73	93.54	96.51	99.65	102.96	106.45	110.15	114.05	118.17	122.52
Fuel cost (Rs lakh)	186.82	224.19	235.40																	
Tariff																				
Fixed tariff (Rs / kWh)	2.20	1.89	1.85	1.81	1.77	1.74	1.70	1.67	1.64	1.62	1.44	1.48	1.53	1.58	1.63	1.69	1.75	1.81	1.87	1.94
Variable tariff (Rs / kWh)	**3.39**	**3.55**	**3.73**																	
Levelised Fixed tariff (Rs/kWh)	**1.77**																			
Ad Benefit (Rs/kWh)	**0.29**																			
Levelised Fixed tariff (Rs/kWh)with AD benefit	**1.49**																			

Annexure IV
Tariff for biomass based power project with air-cooled condenser

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	55.19	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07
Costs																				
O&M	24.90	26.32	27.83	29.42	31.10	32.88	34.77	36.75	38.86	41.08	43.43	45.91	48.54	51.31	54.25	57.35	60.63	64.10	67.77	71.64
Depreciation	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	14.94	14.94	14.94	14.94	14.94	14.94	14.94	14.94	14.94	14.94
Interest on term loan	42.59	38.11	33.62	29.14	24.66	20.17	15.69	11.21	6.72	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	6.45	7.31	7.58	7.86	8.17	8.49	8.83	9.19	9.57	9.97	10.29	10.79	11.31	11.86	12.44	13.05	13.68	14.36	15.06	15.80
Return on Equity	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92
Tax on equity	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79
Fixed cost (Rs lakh)	128.92	126.72	124.01	121.41	118.91	116.53	114.27	112.13	110.13	108.27	96.36	99.34	102.49	105.82	109.33	113.04	116.96	121.10	125.47	130.09
Fuel cost (Rs lakh)	194.20	233.04	244.69																	
Tariff																				
Fixed tariff (Rs / kWh)	2.34	2.01	1.97	1.92	1.89	1.85	1.81	1.78	1.75	1.72	1.53	1.58	1.63	1.68	1.73	1.79	1.85	1.92	1.99	2.06
Variable tariff (Rs / kWh)	**3.52**	**3.69**	**3.88**																	
Levelised Fixed tariff (Rs/kWh)	**1.89**																			
Ad Benefit (Rs/kWh)	**0.31**																			
Levelised Fixed tariff (Rs/kWh)with AD benefit	**1.58**																			

Annexure V
Tariff for bagasse based co-generation projects

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09
Costs																				
O&M	13.71	14.49	15.32	16.20	17.13	18.11	19.14	20.24	21.39	22.62	23.91	25.28	26.73	28.25	29.87	31.58	33.39	35.29	37.31	39.45
Depreciation	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71
Interest on term loan	39.08	34.97	30.85	26.74	22.63	18.51	14.40	10.28	6.17	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	3.50	3.59	3.68	3.78	3.88	4.00	4.12	4.24	4.38	4.53	4.59	4.80	5.02	5.26	5.50	5.76	6.03	6.32	6.62	6.93
Return on Equity	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19	19.19
Tax on equity	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Fixed cost (Rs lakh)	106.75	103.51	100.31	97.17	94.09	91.07	88.11	85.22	82.40	79.66	67.63	69.21	70.88	72.64	74.50	76.47	78.55	80.74	83.06	85.51
Fuel cost (Rs lakh)	151.71	159.29	167.26																	
Tariff																				
Fixed tariff (Rs / kWh)	2.22	2.15	2.09	2.02	1.96	1.89	1.83	1.77	1.71	1.66	1.41	1.44	1.47	1.51	1.55	1.59	1.63	1.68	1.73	1.78
Variable tariff (Rs / kWh)	**3.15**	**3.31**	**3.48**																	
Levelised Fixed tariff (Rs/kWh)	**1.86**																			
Ad Benefit (Rs/kWh)	**0.32**																			
Levelised Fixed tariff (Rs/kWh)with AD benefit	**1.54**																			

(Note: Variable tariff is linked to the financial year)