Before the Karnataka Electricity Regulatory Commission, Bangalore

Dated 14th May, 2018

Present:

Sri. M.K. Shankaralinge Gowda	-	Chairman
Sri. H.D. Arun Kumar	-	Member
Sri. D.B. Manival Raju	-	Member

In the matter of determination of tariff in respect of Mini-Hydel, Bagasse based Co-Generation and Rankine cycle based Bio-mass Renewable Energy Power Projects

Preamble:

1. In exercise of the powers conferred under the Electricity Act, 2003 and the KERC (Power Procurement from Renewable sources by Distribution Licensee and Renewable Energy Certificate Frame work) Regulations, 2011 framed thereunder, the Karnataka Electricity Regulatory Commission (KERC) had issued the Order dated 01.01.2015, determining the tariff for Mini-Hydel Projects, Bagasse based co-generation power plants and Rankine cycle based biomass power plants with water cooled condenser. The Tariff determined as per this Order was made applicable to the power plants commissioned during the period between 01.01.2015 and 31.03.2018, for which the PPAs have not been entered into prior to the date of issue of the said Order. The said Order also specified that the variable cost determined for Bagasse based co-generation and Rankine cycle based biomass power plants with water cooled condenser will be reviewed after 31.03.2018.

2. Further, the Commission vide its Order dated 10.07.2014, has determined the tariff for Rankine cycle based biomass power plants with air cooled condenser and the tariff determined was made applicable to such projects achieving commercial operation during the period from 01.04.2014 to 31.03.2018.

3. The Commission, vide its Order dated 22.01.2015, had also re-determined the tariff for existing Rankine cycle based biomass power plants with water cooled condenser and bagasse based co-generation power plants, keeping in view the revised fuel costs, for the period FY 2014-15 to FY 2017-18. In the said Order the Commission has also stated that wherever the tariff as per the said Order is lower than the tariff now applicable to the existing units, the existing tariff, as per the PPA, shall continue till such time the tariff as determined above exceeds the tariff as per the PPA, after which the tariff as per the above Order shall be applicable. Further, in the said Order it was stated that the fuel cost for the existing biomass based power plants with water cooled condenser and bagasse based co-generation power plants, after 31.03.2018 will be as may be determined by the Commission after taking into account the then prevailing fuel prices and other factors.

4. Thus, the Commission has to determine the tariff for Mini-Hydel Projects, Bagasse based co-generation power plants and Rankine cycle based biomass power plants with water cooled condenser as well as air-cooled condenser which are likely to be commissioned after 31.03.2018. Further, the tariff for existing bagasse based co-generation and Rankine cycle

based biomass power plants with water cooled condenser also needs to be revised, keeping in view the proposed revision in fuel costs.

5. Therefore, the Commission issued a Consultation Paper in the matter, inviting comments/suggestions/views from the Stakeholders/Interested Persons on its proposed parameters for determination of Tariff for Mini-Hydel, Co-generation and Biomass power projects, vide notification No. S/01/17 dated 19.12.2017. The Commission published notices in the Times of India, Deccan Herald, Vijaya Karnataka and Udayavani newspapers on 21.12.2017, in addition to hosting the same on the Commission's website. The Commission also held a public hearing on the tariff proposals on 13.03.2018, the notice for which was published in the Times of India, Deccan Herald, Vijaya Karnataka and Udayavani newspapers on 21.02.2018, in addition to hosting on the Commission's Website. The list of persons, who submitted written comments/views/suggestions is enclosed as Annexure-1 and the list of persons who made oral submissions in the public hearing, is enclosed as Annexure-2.
6. The Commission appreciates the active participation of stakeholders in these proceedings.
7. After considering the written and oral submissions received in the matter and in exercise of the powers conferred under Section 62(1) (a) read with Sections 64 and 86(1)(e) of the Electricity Act,2003 and Regulation 9 of the KERC (Power Procurement from Renewable sources by Distribution Licensee and Renewable Energy Certificate Frame work) Regulations, 2011 and all the other powers enabling it in this behalf, the Commission hereby issues the following Order:

O R D E R

The comments/views/suggestions received from the stakeholders/ Interested Persons on the various issues raised during the consultation process and the decisions of the Commission thereon are discussed below:

1. **Common Issues:**

(1) Applicability:

The Commission has not received any comments on this issue. Therefore, as proposed in the Consultation Paper, the Commission decides to adopt the norms and tariff as determined in this Order for Mini-hydel power Plants with installed capacity upto and including 25 MW, Bagasse based Co-Generation Power Plants and Biomass based power plants with water cooled condenser as well as air cooled condenser, to be commissioned during the period from 01.04.2018 to 31.03.2021, for which PPA is not entered into as on 31.03.2018 and the tariff determined shall be applicable for the period of the PPA i.e. 20 years.

Further, based on the fuel parameters as decided in this Order, the Commission decides to revise the variable costs for the existing Bagasse based Co-Generation Power Plants and Biomass based power plants with water cooled condenser also.

(2) Methodology & Life of the plant:

REDAK has suggested that the formula used by the CERC for levelised tariff is more rational, rather than the arithmetic average.

The Commission in the last tariff Order has determined the tariff for Mini-Hydel Projects on levelised basis and not on arithmetic average. The Commission decides to continue the levelised tariff for the fixed costs over the life of the project. The variable cost, wherever fuel is involved, is being determined based on the specific fuel consumption and the fuel cost as determined.

For the purpose of levelised tariff, the Commission decides to consider the period of life of the plant as 35 years for Mini-hydel plants; and 20 years for bagasse based cogeneration and biomass plants.

Further, to compute the levelised tariff, the Commission decides to continue the normative weighted average cost of capital[WACC} as the discount factor.

(3) Tariff to be single part or two parts:

The Commission has not received any comments on the above issue. Therefore, the Commission **decides to continue single part tariff for Mini-hydel projects,** since no variable cost component is involved. However, the single part tariff will be on levelised basis.

In the case of bagasse based co-generation power plants and biomass based power plants, the Commission decides to continue the two-part tariff, as these power plants use bio-fuel and thus have variable cost components. The fixed cost has been levelised for the life of the plant and the variable cost has been determined for a period of three years.

Further considering that the recovery of fixed cost is linked to normative PLF, it was proposed that for any reduction in normative PLF the fixed levelised cost/unit shall be reduced on pro-rata basis. This was proposed based on similar norm adopted in the case of thermal plants. However, it is considered that its adoption to RE plants now, would not be reasonable. Hence, the proposal is dropped.

(4) Factoring of Incentives allowed by the Government in tariff computations:

The Commission, as a promotional measure, had proposed to continue its present policy and accordingly, not factor any incentives or subsidies extended by the Central or State Government, for tariff computations of RE sources.

The CEA has suggested to consider the incentives or subsidies extended by the Central or State Government for tariff determination, as the CFA provided is up to 30% of project cost and would have impact on the Capital Cost.

The Commission notes that the incentives or subsidies extended by the Central or State Government were not considered earlier, so as to encourage RE capacity addition within the State, when there were substantial power shortages. However, at present the State has almost attained power surplus situation and with sufficient RE Capacity installed in the State and the State meeting its RPO target, not factoring the incentives/subsidies which impact tariff, while determining tariff, would affect the consumers' interest, as rightly pointed out by the CEA, that too when RE power in the market is available at rates below Rs.3.00/unit. Hence, the Commission decides to factor the Capital subsidies extended by the Central or State Government, while determining the tariff. Other incentives like tax, duty exemptions, if any, cannot be computed directly without having data and therefore, are not considered for tariff computation in the present Order.

(5) Power Purchase Agreements[PPAs]:

The Commission has not received any comments on the above issue. The RE generators selling electricity to the distribution licensees of the State shall enter into PPA in the standard format approved by the Commission. Any deviation to the clauses in the standard PPA format, shall be approved by the Commission. The deviations as approved in this Order shall be carried out in the Standard formats of PPA while executing PPA with any generating company in pursuance of this Order.

(6) Tariff for infirm power injected during stabilisation period and for energy generated beyond normative PLF:

The Commission has not received any comments on the above issue.

The Commission therefore decides as proposed that:

a. The Tariff for the infirm power injected by a power plant during stabilisation period, if any, shall be fifty percent of the generic tariff applicable to the specific type of the plant.

b. For energy generated beyond normative PLF, the tariff shall be the levelised tariff as determined in this Order for Mini-hydel power plants. For co-generation and biomass plants, it shall be the variable cost/unit based on the norms adopted plus 2% of the variable cost.

(7) Sharing of Clean Development Mechanism (CDM) benefits:

The Commission had proposed to continue the present arrangement.

REDAK has stated that as there is no CDM market, there is no impact of the same on the tariff.

The Commission, however, decides that the sharing of CDM benefits, if any, shall be as follows:

a) In the first year after the date of commercial operation of the generating station, 100% of gross proceeds on account of CDM benefit shall be retained by the project developer.

b) In the second year, the share of beneficiaries shall be 10%, which shall be progressively increased by 10% every year till it reaches 50%, and thereafter, the proceeds shall be shared in equal proportion by the generating companies and the beneficiaries.

(8) Wheeling & Banking charges and Surcharges, in the case of third party sales:

The Commission has not received any comments on the above issue. The Commission, therefore, decides as proposed that for captive use and third party sale of the energy generated, the Transmission charges, Wheeling & Banking charges, Cross-subsidy surcharge and Additional Surcharge shall be as determined by the Commission in its orders issued from time to time.

(9) Reactive power charges & Start-up Power Charges:

The Commission has not received any comments on the above issue.

The Commission, therefore, decides as proposed to continue reactive power charges of 40 paise/ kVArh.

Further, for the start-up power and power drawn by the generating units for other purposes (other than during construction), the charges shall be as per the terms of the PPA or orders issued by the Commission from time to time.

(10) Merit Order Dispatch:

The Commission had proposed to discontinue the current Merit Order Dispatch Policy.

REDAK has stated that, discontinuation of current Merit Order Dispatch Policy would further reduce the PLF and makes the Small Hydro Power Plants as Non-Performing Assets.

The CEA has stated that, the Policy of granting must run status should not be linked to maturity state of technology. That, if such resources are not utilized on the particular instant, it would lead to loss for generating company and for society to reduce carbon emission. As such SHP should be kept –off from merit order dispatch.

The Commission, had proposed to discontinue its earlier policy of not applying Merit order dispatch for all RE projects, as the sector has attained maturity. However, considering the CEA's views, the Commission decides to provide must run status for Mini-Hydel Projects. Further, considering that similar justification not being applicable to bagasse based co-generation plants and biomass based power plants, the must run status provided to them is withdrawn.

2. Common Financial Parameters:

(1) Debt Equity Ratio:

The Commission had proposed to continue the current normative Debt: Equity Ratio of 70:30.

a. Comments of stakeholders/Interested Persons:

One of the stakeholders has stated that Debt: Equity as per IREDA is 50:50 for Biomass plants and therefore, Financial Institutions and private banks who charge not less than 12.50% interest, have to be approached for additional debt beyond 50%.

b. Commission's views and Decision:

The Commission notes that the stakeholder has not proposed any specific Debt: Equity ratio, except for stating the IREDA's norms, which are not binding on the Commission. **Keeping in view the norms contained in the prevailing Tariff Policy issued by Government of India and the norms prevailing in the industry, the Commission decides to continue the normative Debt-Equity Ratio of 70:30.**

(2) Return on Equity (RoE):

The Commission had proposed adoption of RoE of 14% with actual Income tax paid by the generator as a pass through.

a. Comments of stakeholders/Interested Persons:

Auric Industries Ltd., has stated that biomass projects being risky, RoE of 16% shall be retained. Similarly, REDAK has requested to retain 16% RoE, stating that, the actual IRR will be less than target IRR and with 14% RoE, the IRR would be 10-12%, which will affect Debt Service Coverage Ratio (DSCR) in first 10 years.

b. Commission's Views and Decision:

As per the prevailing Tariff Policy, the RoE determined by the CERC for generation has to be adopted by the SERCs. The CERC has specified RoE of 14% and hence, the same needs to be adopted.

In view of the above, the Commission decides to allow RoE at 14% on the Equity.

(3) Interest on Term Loan:

The Commission had proposed to adopt interest rate on term loan at 11% with a loan tenure of 13 years.

a) Comments of stakeholders/Interested Persons:

Both REDAK and Auric Industries have stated that banks are at present charging 12% to 13% interest, considering the risk involved in Biomass and Mini-Hydel Projects. REDAK has further stated that the CERC has considered interest rate at 2% above MCLR of 7.97%, which is inadequate.

MESCOM has stated that interest rates are coming down and therefore,10% may be adopted for both term loan and working capital.

CEA has stated that the proposed interest rate is higher and has suggested for adoption of the CERC's methodology.

b) Commission's Views and Decision:

The Commission has noted the interest rate suggested by the Stake holders. The Commission in its Consultation Paper had noted that the interest rate adopted by various Commissions is in the range of 10.66% to 12.30%.

The Commission also notes that, with effect from 22.01.2018, Indian Renewable Energy Development Agency (IREDA) has revised the interest rates, which now vary from 10.10% to 11.25% for RE projects other than wind & solar projects, with a reduction of 25, 20 and 15 base points for grades 1 to 3 respectively with external grading.

Similarly, PFC has revised the rate of interest with effect from 17.04.2018, which now varies from 9.60% to 10.00% for State Sector and 9.50% to 11.00% for private sector with rating IR-1 to IR-5 respectively for RE sources other than Biomass Power Plants. For Biomass Power Plants, it now varies from 10.50% to 11.00% for State Sector and 11.00% to 12.00% for Private Sector.

As per the latest data, with effect from 01.05.2018, the MCLR of SBI is ranging between 8.15% to 8.35% for loan tenure varying from one year to three years. Considering 200 bps above MCLR, the maximum interest rate would be 10.35%.

The above facts indicate that the domestic loan would attract interest rate in the range of 9.50% to 12.00%, depending upon the credit ratings of the RE generators, with the average working out to 10.75%. The CERC in its Order dated 28.03.2018 has considered interest on term loan as 9.97%.

Hence, the Commission decides that an interest rate of 10.50% on term loans is reasonable as against the 11% proposed in the Consultation Paper. The tenure of debt is considered as 13 years in tune with the latest CERC Regulations dated 17.04.2017.

(4) Depreciation:

The Commission had proposed to provide 5.38% of 85% of the Capital Cost as the depreciation per annum on straight line method for the first thirteen years

a. Comments of stakeholders/Interested Persons:

CEA has stated that the value of depreciable asset is indicated as 85% of Capital cost but salvage value is mentioned as 10%. That the anomaly needs to be resolved.

b. Commission's Views and Decision:

The Commission clarifies that it had proposed that, out of the total capital cost, which includes land and other non-depreciable assets, 85% of such cost is considered as the value of assets that can be depreciated and 10% of such 85% cost is taken as the salvage value of the depreciable assets.

Accordingly, the Commission decides to consider 85% of the total capital cost as the value of depreciable assets and excluding 10% of it as salvage value, provide 5.38% of such capital cost of depreciable assets, as the depreciation per annum on straight-line method for the first thirteen years, to ensure debt servicing. The remaining value of the depreciable assets is allowed to be recovered during the balance period of the plant life at equal annual rates.

(5) Interest on working capital (IWC):

The Commission had proposed to adopt interest rate of 12% on working capital.

a. Comments of stakeholders/Interested Persons:

MESCOM has stated that Interest rates are coming down and therefore,10% may be adopted for both term loan and working capital.

b. Commission's Views and Decision:

The Commission notes that MESCOM has suggested interest on working capital of 10%. The interest rate adopted by the other State Commissions is in the range of 11% to 12.80% as indicated in the Consultation Paper issued. The CERC in its Order dated 28.03.2018 has specified working capital interest of 10.97%. **Hence, the Commission decides that an interest rate of 11.50% on working capital is reasonable,** as against 12% proposed.

Further, the Commission in its Tariff Order dated 01.01.2015 had considered two months' receivables for mini-hydel and bagasse based cogeneration power plants and two months' receivables plus two months' variable costs for biomass based RE power plants as working capital. The Commission decides to continue the existing norms for computing working capital of these plants.

(6) Income Tax:

The Commission had proposed to allow Income Tax including any Surcharge and cess as a pass through on RoE.

a. Comments of stakeholders/Interested Persons:

REDAK has stated that tax should be the actual tax demanded as per the returns filed or paid as per assessment orders in the case of standalone companies. That in the case of projects which are part of other business, tax calculated as per IT return as certified by auditors can be pass through. Subsequently, it has also requested that IRR shall be grossed up by tax rate as done by the CERC, to avoid litigation.

b. Commission's Views and Decision:

The Commission has noted the comments, of the Stakeholder. The objective of the Commission is to allow income tax to the extent of RoE only, pertaining to electricity business. Hence, the Commission decides to allow Income Tax including any surcharge and cess on it as a pass-through without factoring in the same for tariff computations. The amount of Income Tax, including any surcharge and cess that can be claimed shall be worked out on the amount of RoE approved by the Commission. The Income Tax at the rates [including any surcharge and cess] prevailing in the relevant years shall be claimed separately from the ESCOMs, duly furnishing the necessary proof of tax payment.

4. Issues applicable to specific RE projects:

(1) Mini-Hydel Projects:

(i) Capital cost:

The Commission had proposed a capital cost of Rs.6.20 Crs./MW.

a. Comments of stakeholders/Interested Persons:

REDAK has stated that, the approach adopted by the Commission in comparing costs in other States, should be supplemented by realistic assessment. The Project Cost in 2023 would be Rs.10.28 Crs./MW considering 5.72% escalation of the CERC approved cost of Rs.7.79 Crs./MW. The project cost proposed by the KERC is 80 to 88% of cost considered by the CERC and the project cost of completed projects at present is about Rs.6.00 Crs./MW. If the project cost of FY17 is considered for FY23, it would not reflect cost of FY 23. MERC is the only State Commission which has reduced Capital Cost, which may not be applicable for Karnataka. Further, 18% GST instead of VAT & excise duty,18% on civil works from 5% VAT, 18% on machinery from 12.5%+2%, has increased the costs. Even considering the present project cost, by 2023 the cost would be Rs.7.00 Crs. /MW with 5.72% annual escalation. Any project would take minimum 24-36 months and there are no projects in Karnataka ready for commencement. Thus, the Capital Cost should be minimum Rs.7.00 Crs. /MW.

The MESCOM has stated that, the capital cost as fixed by the GERC should be adopted as it is prudent and reasonable. As indicated in the Consultation Paper, for Mini-Hydel projects, the GERC has specified Rs. 7.48 Crs. /MW for 5 MW to 25 MW and Rs. 8.20 Crs. /MW for less than 5 MW capacity projects.

b. Commission's Views and Decision:

The Commission has noted the stakeholders' proposals and their reasons. In the Generic Tariff Order 2015, the Commission had approved Capital Cost of Rs.6.20 Crores/MW and had proposed to retain the same for the current control period in the Consultation Paper. The Commission notes that the capital cost adopted by the SERCs in the neighbouring States of Kerala and Maharashtra is in the range of Rs. 5.45 to 6.46 Crs. /MW. While the CERC has not specifically indicated the cost of mini-hydel projects for Karnataka or any of the Southern States, the capital costs for 'other states' is determined at Rs.707 lakhs for projects of 5 MW to 25 MW capacity and Rs.779 lakhs for projects of less than 5MW capacity, in its Order dated 28.03.2018.

The Commission considers it appropriate to escalate the Capital Cost approved in its Generic Tariff Order 2015, by 5.72% per annum to account for inflation and other factors like change in tax regime. Considering the above, the Capital Cost works out to Rs.7.33 Crs./MW. The Commission notes that, for Min-Hydel Projects, the MNRE has extended a subsidy of at Rs.1.00 Cr./MW, limited to Rs.5.00 Crores per Project, as per the document furnished by the KREDL. Most of the projects commissioned in the State are of around 5 MW capacity and therefore, the subsidy per MW works out to Rs.1.00 Crs./MW. For the reasons stated earlier, after factoring the capital subsidy specified by the MNRE, **the Commission decides to adopt Rs.6.33 Crs./MW as the capital cost of Mini-Hydel Projects including the evacuation costs and taxes, for the control period upto 31.03.2021, without any indexation.**

(ii) Plant Load factor (PLF):

The Commission had proposed a PLF of 30%.

a. Comments of stakeholders/Interested Persons:

REDAK has stated that good project sites in Karnataka have been utilized and for new projects the PLF may be less than 30%. Further, with lower CUF, the tariff would be higher and therefore, GoK and the Regulator should decide the question of supporting small hydro projects (SHP) and their necessity for the economy. That the MNRE strongly supports promotion of SHPs even at higher costs. That, further, the PLF could be benchmarked based on actual PLF achieved. In reality, the PLF is less than 25%. However, subsequently, it is stated that the PLF proposed by the KERC is the same as that of CERC.

b. Commission's Views and Decision:

Regarding the stakeholder's comments, the Commission is of the view that, the promotion of SHPs, as a policy comes under the purview of the State Government. Further, it is noted that the stakeholder has not furnished the details of actual PLF. We also note that the actual PLF in the past few years may be low due to poor rainfall, which cannot be considered while determining Generic Tariff for the life of the plant. For the purpose of generic tariff normative PLF needs to be considered. The Commission, all these years, has considered 30% as PLF for Mini-Hydel Projects, which is the same as specified by the CERC.

Hence, the Commission decides to adopt a PLF of 30% for mini-hydel projects.

(iii) Auxiliary Consumption:

The Commission had proposed auxiliary consumption of 1% of annual generation.

a. Comments of stakeholders/Interested Persons:

REDAK has stated that the proposal by the KERC is same as that of the CERC.

b. Commission's Views and decision:

The Commission notes that the KSERC, the MERC and the GERC, as well as the CERC have all approved auxiliary consumption of 1% for mini-hydel plants. **Hence, the Commission decides to adopt the existing auxiliary consumption at 1% of the annual generation.**

(iv) O & M expenses and annual escalation rate:

The Commission had proposed to adopt O&M expenses at 2% of Capital Cost with an annual escalation of 5.72%.

a. Comments of stakeholders/Interested Persons:

REDAK has stated that O & M costs would be higher due to remote location of the projects, while furnishing details of O & M expense of one 1.5 MW plant at Rs.96.24 Lakh per annum i.e. 9.6% of current project cost proposed by REDAK. Further, it states that the CERC has considered 4% of Capital Cost (CC) as O & M expenses for smaller projects and 3% for larger projects. Thus. It is requested that a reasonable 5% of CC must be provided upto 5 MW and 3% for above 5-MW capacity projects.

b. Commission's Views and Decision:

The O & M expenses approved by the Commission in its Order dated 01.01.2015 is 2% of the capital cost with an annual escalation of 5.72%. The O & M expenses considered by other Commissions are as follows:

Regulatory Commission	O & M expenses	Order dated
GERC	2.5% of CC for 5-25 MW capacity and 3.3% of CC for below 5 MW capacity.	14.12.2016
Kerala	16.54 lakhs/MW for 5 MW to 25 MW with annual escalation of 5.72% 23.63 lakhs/MW for less than 5 MW with annual escalation of 5.72%.	Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.(Dated 11.11.2015)
MERC	16.65 lakhs/MW for > 5 MW and up to and including 25 MW; 23.52 lakhs/MW > 1 MW and up to and including 5 MW.	28.04.2017

The CERC, in its Order dated 28.03.2018, has approved O& M expenses at Rs. 22.20 lakhs/MW for 5 MW to 25 MW with annual escalation of 5.72% and Rs. 30.66 lakhs/MW for less than 5 MW with annual escalation of 5.72%, which works out to 3% of CC and 4% respectively.

Considering the above facts, the Commission decides to allow O & M expenses at Rs.14.66 Lakhs for the base year FY 19, with an annual escalation of 5.72% per annum during the control period.

(2) Bagasse based Co-Generation Power Projects:

(i) Capital cost:

The Commission had proposed to adopt the capital cost at Rs.4.75 Crs./MW, including the power evacuation infrastructure cost, as in the previous Generic Tariff Order.

a. Comments of stakeholders/Interested Persons

SISMA has requested to consider a Capital Cost of Rs.5.43 Crs./MW for the new power plants, including expansion on the grounds that,

i. CERC in its Notification dated 17.04.2017 has considered Rs.492.50 lakhs/MW, for high pressure boilers for FY18.

ii. The Department of Food and PD of the GoI, vide its letter dated 23.02.2016 has revised the normative cost of Cogen plants, depending upon the boiler pressure 67- 86 ATA-Rs.385 lakhs, 87-109 ATA- Rs.442 Lakhs and for 110 & above Rs.543 lakhs. As per NFCSFL, sugar mills undergoing expansion are adopting 87 kgs/cm2 boiler pressure and the new plants 105 to 110 kgs/cm2.

The MESCOM has stated that the capital cost fixed by GERC at Rs.4.57 Crs. /MW should be adopted as it is prudent and reasonable.

b. Commission's Views and Decision:

The Commission notes that the capital cost adopted by some of the Commissions referred in the Consultation Paper is in the range of Rs.4.36 Crs./MW to 5.20 Crs./MW.

Further, in the 2015 Order, the Capital Cost approved by this Commission is Rs.4.75 Crs./MW including evacuation cost. Further, as per the information furnished by SISMA, it is noted that most of the new plants are adopting boiler pressure of 105 to 110 kgs/cm2 as per NFCSFL norms and as per the Department of Food and PD of the GoI, the revised normative cost of Cogen plants, for the boiler pressure of 87-109 ATA is Rs.442 Lakhs. In case any developer of cogeneration plant adopts pressure higher than 110kgs/cm2, the increase in capital cost would be more or less set-off by the increase in operational efficiency, which would result in lower specific fuel consumption, thereby saving the fuel cost. Since the Commission is retaining the specific fuel consumption at 1.60 kg/unit for the power plants adopting more than 110 kgs/cm2 pressure also, the Commission decides to adopt the same capital cost, irrespective of boiler pressure adopted. The Commission had proposed a capital cost of Rs.4.75 Crs./MW without considering the capital subsidy granted by MNRE/KREDL. As per the information obtained from KREDL, for Co-generation plants, the MNRE is extending subsidy of Rs. 15 Lakh x (Capacity in MW) ^0.646. Most of the Co-gen plants in the State have installed Capacity in the range 20MW to 40 MW and therefore, for the purpose of determining capital subsidy, the Commission has considered a capacity of 30MW. Thus, the Capital subsidy/MW works out to 15x(30^.646)/30= Rs. 4.50 Lakhs /MW. For the reasons stated earlier, after deducting the capital subsidy, the Capital Cost/MW would be Rs 4.71 Crores/MW. Thus, Rs.4.70 Crs./ MW would be a reasonable Capital Cost, including evacuation cost and the applicable GST, for the new control period 2019-2021.

Therefore, the Commission decides to adopt a Capital cost of Rs.4.70 Crs./MW including infrastructure cost of evacuation, for the entire control period, without any indexation.

(ii) Plant Load factor

The Commission had proposed to continue with the existing PLF of 60%.

a. Comments of stakeholders/Interested Persons:

PLF of 53% is proposed by SISMA, stating that, the CERC has considered PLF of 53% for the States having average crushing days of 150 or less. Based on the data published by ISMA for FY12 to FY17, it is stated that the average crushing days in Karnataka has not gone beyond 150 days and therefore it has requested for PLF of 53%.

b. Commission's Views and Decision:

The Commission notes that the SISMA has mainly relied on the CERC's Order wherein the PLF for 'Other States' is 53%, While SISMA has furnished only crushing days' data published by the Indian Sugar Journal during the period FY12-FY17, it has not furnished the actual PLF achieved by the operating plants in Karnataka during the same period to substantiate its stand of 53% PLF. It is worthwhile to note that, the Commission in all its earlier Orders has retained 60% as PLF. The issue regarding PLF was contested by SISMA in Appeal No.148 of 2010 and the Hon'ble ATE has upheld the decision of the Commission specifying the PLF at 60%. Thus, the matter has reached finality and no case has been made out for its review.

Hence, the Commission decides to continue the PLF at 60% for the control period FY 2019-2021.

(iii) Auxiliary Consumption

The Commission had proposed to adopt auxiliary consumption at 8.5% as against 9% adopted earlier.

a. Comments of Stakeholders/Interested Persons:

No comments have been received on this proposal.

b. Commission's Views and Decision:

The Commission had proposed to reduce auxiliary consumption from the existing 9% to 8.5% in the Consultation Paper. Since, none of the Stakeholders has objected to the above proposal, **the Commission decides to allow 8.5% as the applicable auxiliary consumption for the control period FY 2019-2021.**

(iv) O& M expenses and annual escalation rate:

The Commission had proposed to continue the O&M expenses at 3% with an annual escalation of 5.72%.

a. Comments of stakeholders/Interested Persons:

No comments have been received on this proposal.

b. Commission's Views and Decision:

The Commission had proposed to continue 3% of the Capital Cost as the allowable O & M expenses in the base year with an annual escalation of 5.72% for the bagasse co-generation plants. Since, none of the stakeholders has objected to the above proposal, **the Commission decides to allow 3 % of the Capital Cost as the allowable O & M expenses in the base year with annual escalation of 5.72%, for the control period FY 2019-2021.**

(v) Specific Fuel Consumption:

The Commission had proposed to continue with the existing specific fuel consumption of 1.60 Kg/Kwh.

a. Comments of stakeholders/Interested Persons:

No comments have been received on this proposal.

b. Commission's Views and Comments:

The Commission considering that it had approved specific fuel consumption of 1.60 kg/kWh for the existing plants taking the calorific value of bagasse as 2250 kcal/kg and heat rate of 3600 kcal/kWh in its 2015 Tariff Order, had proposed to continue the same. In the absence of any comments/objections from the stakeholders on this proposal, **the Commission decides to continue the existing specific fuel consumption of 1.60 kg/kWh.**

(vi) Fuel cost:

The Commission had proposed to link the fuel cost for in-house bagasse to, the domestic pithead unwashed coal cost with GCV of 2250 kcal/kg or the administered price of sugar cane as per which the cost of bagasse works out to Rs.765/MT.

a. Comments of stakeholders/Interested Persons:

SISMA's Comments:

(a) The proposal of linking the bagasse cost to pithead unwashed coal is not acceptable for following reasons:

  i. The TERI Report to the CERC has recommended that the price for alternative use of bagasse in other applications can be considered in short-term or alternatively it can be linked to the fuel cost with equivalent coal costs. Thus, the alternative price, bagasse would have otherwise got, should be considered.

ii. The CERC Regulations specify that the cost of bagasse should include handling cost, transportation cost and annual inflation rate. Thus, deduction of transportation cost is illogical.

iii. Commission has considered GCV of unwashed pithead coal with GCV of 2250 kCal/kg. The average GCV of biomass is 2900kcal/kg, when fully dried. The GCV notified by the Coal Controller and the Ministry of Coal, indicates that the GCV of the lowest graded coal varies between 3101 to 3400 kcal/kg and there is no mention of GCV of less than 3000 kcal/kg. Further, washed non-coking coal is used for power generation and the pit head coal cost is the base price and does not include loading, transportation and other costs. GCV of unwashed pithead coal varies from 2201 to 2500 kcal/kg, which is one of the lowest grade coal and not used in high pressure boilers. Landed cost of BTPS coal is Rs. 4746/tonne with GCV of 3591 kcal/kg, which is to be considered and thereby the bagasse price will be RS.2974/ton on GCV basis.

(b) The proposal of linking bagasse price to the sugarcane price is not acceptable for the following reasons:

i. The Sugarcane price, as announced by the GoI, is increasing year on year. Further, the APTEL in its order in Appeal No.148 of 2010, has held that 'the contention that simply because the generation of power is made by co-generation unit, the fuel price is ignorable, is against the principle that determination of tariff has to be on commercial principles.' That as further observed by the ATE, the CERC in its 2009 Regulations, has provided that the bagasse price shall be linked to index formula or alternately be escalated at 5% per annum.

ii. The Karnataka Sugarcane (Regulation of purchase and supply) Act, 2013, provides for determination of sugarcane price on revenue sharing basis taking into consideration the actual revenue realized from sugar, bagasse, molasses and press mud. In terms of the Regulations, the State Government is declaring additional sugarcane price payable over and above FRP. The price for bagasse considered by the Expert Committee for FY17 is Rs.1670/tonne, which is notified by the Cane Commissioner.

In view of the above, the bagasse price for FY18 should be Rs.2974/tonne on GCV basis or Rs.1850/tonne linking to sugarcane price or Rs. 1890/tonne considering fuel price of Rs.1600/tonne as per the Tariff Order,2015 with escalation of 5.72% over Rs.1600/tonne.

NSL Sugars Ltd.:

(a) The Commission should continue the principles and methodologies adopted in the Tariff Order 01.01.2015. The proposed methodology is inconsistent with Clause 9(3) of the KERC Regulations, 2011. The proposed methodologies were earlier deliberated and the Commission in its 2009 and 2015 Orders decided against 'no cost/notional cost' principle and allowed base rate with annual escalation.

(b) The no cost principle did not find favour of APTEL in Appeal No.148 of 2010.

(c) The proposed methodology is against the principle and methodology adopted by the CERC.

(d) Dr C. Rangarajan Committee has observed that 70% value of by-products at ex-mill including the imputed value of molasses and bagasse has to be considered for fixing cane price. Thus bagasse, even though generated internally has a value and that value should be equal to value in the market.

(e) The proposal to link the fuel cost with pit-head coal is arbitrary and inconsistent with the equivalent heat value principle specified by the CERC. The equivalent heat value of landed coal cost shall be minimum as per the CERC. Average landed cost of KPCL generating Stations is 4746/MT with GCV of 3591 kcal/kg for the month of April,2016. Thus equivalent heat value cost would be Rs. 2974/MT.

(f) The proposal to consider 30% of administered price of sugarcane, as every tonne of sugarcane crushed produces 30% bagasse, is also arbitrary.

(g) MERC has adopted latest bagasse price fixed by the CERC and the TNERC has adopted Rs. 1788/MT.

Thus, as no fresh reasoning is found to adopt 'no cost/nominal cost' principle for next control period and therefore, Commission may refrain from adopting the methodology and should determine fuel cost as follows:

(i) 5.72% escalation over FY18 cost of Rs.1788/MT; or

(ii) Equivalent heat value of landed cost of fuel as per the CERC methodology, which works out to Rs.2974/MT; or

(iii) Market value of bagasse in Karnataka at Rs.1900/MT for FY18 with 5.72% escalation.

b. Commission's Views and Decision:

(1) The Commission, in its Consultation Paper had proposed the following options for determination of fuel cost for the internally generated bagasse:

(a) The Commission had proposed a fuel cost of Rs.600/tonne, considering the fuel cost of Rs.1600/tonne allowed in 2015 Tariff Order, escalating it by 5.72% per annum and deducting the transportation cost of Rs. 1300/tonne.

The Commission considers that the approach adopted by the CERC is not binding and that the Commission can adopt a price determination methodology depending on local factors including State's consumers' interest.

(b) On the alternative proposal of the Commission to link the fuel cost to the domestic pit head unwashed coal cost with GCV of 2250 kcal/kg, on calorific value basis, which varies from Rs.470 to RS.560/MT, the stakeholders have suggested that 'equivalent heat value' of landed cost of coal as per the CERC methodology should be adopted.

As noted earlier, the approach adopted by the CERC is not binding on the State Commission. The CERC, in its SoR for 2009 Regulations, had clarified that, to compute the fuel price of bagasse for respective States, the CERC has adopted 'equivalent heat value' approach for landed cost of coal for thermal Stations for the respective States. For this purpose, the CERC had considered the landed cost and calorific values of coal as approved by the respective State Electricity Regulatory Commissions while determining the generation tariff of the respective State Utility. The bagasse prices so derived had been escalated based on fuel price indexation mechanism stipulated under the Regulations to derive fuel prices during subsequent control periods, till the completion of the current Control period. Nevertheless, the Commission notes that the CERC, in its latest Regulations dated 18.04.2017, has done away with indexation mechanism and has adopted a base price with annual escalation of 5%. Further, in the statement of reasons, the CERC has noted that:

a. Indian Sugar Mills Association and NFCSFL have proposed that Fuel Price Indexation Mechanism is not sufficient to arrive at a logical price of bagasse.
b. TSMA has strongly recommended that the Bagasse price and its year on year escalation should be linked to Sugarcane price itself instead of linkage to fossil fuels.

Thus, the Commission notes that only in the year 2009, the bagasse price was determined by the CERC based on 'equivalent heat value' method, which is not relevant, considering the changes in the pricing mechanism of coal today. Thus, the Commission does not find acceptable, the suggestion of stakeholders to adopt the CERC's 'equivalent heat value' method, which is based on the CERC's 2009 Regulations.

(c) The other alternative proposal of the Commission was to link the fuel cost to administered price of sugarcane and consider 30% of such price as bagasse cost, as every tonne of sugarcane crushed produces 30% of bagasse. Based on this, considering that the administered price for FY18 is fixed at Rs.255/quintal, the proposed bagasse price worked out to Rs.765/MT.

The Stakeholders, referring to Dr C. Rangarajan Committee Report, have stated that bagasse though generated internally has a value and the proposal to consider 30% of administered price of sugarcane as the price of bagasse as every tonne of sugarcane crushed produces 30% bagasse, is arbitrary. That the price for bagasse considered by the Expert Committee for FY17 is Rs.1670/tonne, which is notified by the Cane Commissioner. That the CERC in its 2009 Regulations, has provided that bagasse price should be linked to indexation formula or alternatively be escalated at 5% per annum.

The Commission notes that the price arrived for bagasse by the Expert Committee, is for a different purpose (fixing the price of sugarcane) and that such price cannot be adopted for determining tariff for power generated by the cogeneration plants. If the value of bagasse is also taken into consideration for the fixation of the price of sugarcane, there is no bar for considering for such fixation, the value of bagasse as fixed by this Commission for the purpose of determination of tariff for the power generated by the cogeneration plants. If for the internally generated bagasse, the price of Rs.1850/tonne proposed by SISMA, based on bagasse price fixed by the Cane Commissioner is considered, then the generators would earn about Rs.3.00/unit without incurring commensurate expenditure towards purchase of bagasse. If done so, the generators would earn undue profit, in addition to RoE allowed in Tariff, the burden of which has to be borne by the consumers of the State, and therefore the Commission considers that such approach is not in public interest. **Thus, the Commission keeping in view the interest of the consumers, decides not to adopt the bagasse price fixed by the Cane Commissioner for internally**

generated bagasse, for the purpose of determining tariff for power generated by the Co-generation plants.

(2) The proposal of stakeholders to link the fuel cost to market value of bagasse, based on TERI's Report [published in 2010] would not be relevant when the country is moving towards a power surplus situation and the cost of RE power has come down substantially. It is noted that the CERC has also not considered the above approach. Further, the stakeholders present during the public hearing, have stated that though bagasse has alternative use in Paper Industry, at present no paper mill is purchasing bagasse in the State. It is also a fact that no sugar factory in the State is either selling bagasse or purchasing bagasse. Perusal of the crushing capacities of the sugar factories with Co-generation power plants in the State indicates that they generate internally sufficient quantity of bagasse required to run their power plants. **In the circumstances, the Commission decides not to link the bagasse price to a notional market value.**

(3) The Commission also notes that stakeholders have relied upon Hon'ble APTEL's Order in Appeal No.148/2010. The Hon'ble APTEL in the said order has not outrightly rejected the observation of the Commission that there is no expenditure actually incurred for in-house bagasse from accounting point of view as it is available during the season, free of cost. It has only stated that ignoring the fuel price for in-house bagasse (in tariff determination) is against commercial principles. Thus, Commission is of the view that, the final cost determined should be reasonable and just, balancing the interest of the generators and end consumers.

(4) The Commission notes that, the rationale for setting up co-generation plant as an integral part of a sugar factory is for optimal utilisation of the scarce energy sources readily available for mutual benefit of both the generator and all other stakeholders including the grid. Cogeneration plant gives an optimal solution for easy, safe and profitable disposal of bagasse, helps the sugar factory to attain self-sufficiency in power required to run its operations and also derive revenue from sale of surplus power to the grid.

(5) The Commission, in all its earlier Orders has determined promotional tariff for RE sources, the process of which involved fixing of prices of fuel like bagasse, with the objective of encouraging rapid capacity addition to tide over the ever power deficit situation adversely affecting the economy and living standards of the citizens and also to reduce dependence on environmentally harmful fossil fuel based power plants. This policy has led to substantial capacity addition easing the power supply constraints and at the same time resulted in significant reduction in capital cost of RE plants like Solar power plants because of economies of scale, competition, advancement in technology and production process, cheaper funds etc. making it possible for the Commission to successively lower the generic tariff. This positive development has enabled the States' power procurement agencies/ESCOMS to float reverse bidding tenders for development of solar projects in the States for which bids have been received at rates far lower than the generic tariff determined by the Commissions. Similar impact is seen even in wind power projects whose capital cost and thereby the generic tariff had seen periodical upward revision, so far. Recognising this development, the latest Tariff Policy envisages future

procurement of Solar and Wind power only through reverse bidding process. With the State along with other States moving towards energy surplus situation and with substantial capacity addition of solar and wind Power, that too with tariff/rates lower than conventional sources, it is imperative for co-generation power plants to compete with wind and solar in terms of tariff, by reducing their capital and operational costs by improving their overall efficiency. With the distribution licensees and other obligated entities being able to purchase cheap power from other RE sources to meet their RPO targets, there would be no justifiable reasons for making them purchase power from co-generation plants at higher tariffs. As noted earlier, other than placing reliance on an old report of TERI and redundant provisions of the CERC Regulations, no material has been placed on record to indicate the commercial value that the sugar factories in the State could have derived from disposal of internally generated bagasse in the market.

Therefore, it is considered that it would be just and proper to consider the cost at the production point or ex-factory price of bagasse for the purpose of tariff determination and for arriving at such cost, the price paid towards purchase of sugar can be made use of. As per the data obtained from the Office of the Commissioner for Cane Development and Director of Sugar, Karnataka, the average Fair and Remunerative price for sugar cane payable by the sugar factories in the State is Rs.2817 per tonne (It ranges from Rs.2550 to Rs.3260 per tonne) for 2017-18. Considering that one tonne of sugarcane on crushing yields about 30% of bagasse, the price component of bagasse in sugarcane price (pre-production cost) can be taken at Rs.819 per tonne for 2017-18 and with an annual escalation of 5.72% , it works out to Rs.865.85 per tonne for 2018-19.

From the available literature, the cost of production of sugar form sugarcane ranges from 20% to 30%. Considering that bagasse gets generated immediately after crushing of sugar cane, the cost of production of bagasse can be taken at 20% and thereby, the cost of bagasse works out to Rs.1039.00 for 2018-19. With annual escalation of 5.72%, it works to Rs.1098.44 per tonne for 2019-20 and Rs.1161.28 per tonne for 2020-21. The above fuel cost is approved for the control period.

(3) Rankine cycle based Biomass power projects with Water/Air cooled condenser:

i. Capital cost:

The Commission had proposed a capital cost of Rs.5.70 Crores / MW for water cooled condenser biomass based projects and Rs. 5.80 Crs./MW for air-Cooled condenser projects in its Consultation Paper.

a. Comments of Stakeholders/Interested Persons:

Auric Industries Ltd., has stated that in the last 3-4 years', the steel and cement prices have gone up by 50 to 75%. Further, the Government has levied 5% GST on the biomass plants and machinery, whereas earlier they were exempted from customs and excise duty. Also 18% GST is levied for work contracts. Thus they have requested for the capital cost of Rs.6.58 Crs/MW for water cooled condenser biomass based power projects.

MESCOM has suggested adoption of capital cost as fixed by the GERC, which is Rs. 4.68 Crores/MW for water-Cooled Condenser and Rs. 4.98 Crs/MW for Air Cooled Condenser biomass based power plants.

b. Commission's Views and Decision:

The Commission notes that the capital cost adopted by the other Commissions excluding the CERC, is in the range of Rs. 4.63 Crs to Rs 5.50 Crs./MW for biomass based power plants with water cooled condenser and in the range of Rs. 4.63 Crs to Rs. 5.76 Crs/MW for biomass based power plants with air cooled condenser. The CERC, in its Order dated 28.03.2018, based on the type of biomass used, has considered capital cost in the range of Rs. 5.59 Crs/MW to Rs. 6.11 Crs/MW [average is Rs. 5.85 Crs/MW] for water cooled biomass projects and in the range of Rs. 6.00 Crs/MW to Rs. 6.52 Crs./MW Crs/MW [average is Rs.6.26 Crs./MW] for air cooled biomass projects. Thus, the Commission is of the view that the Capital cost of Rs. 5.85 Crs/MW is reasonable for biomass based power projects with water cooled condenser. Most of the Biomass based power plants in the State have installed capacity in the range of 6MW to 15 MW and therefore, for the purpose of determining capital subsidy, the Commission decides to consider the general installed capacity at 10 MW. Thus, the Capital subsidy/MW works out to 20x(10^.646)/10= Rs. 8.85 Lakhs /MW. After deducting capital subsidy, the cost/MW would be Rs 5.76Crs/MW.

Thus, the Commission decides to reckon Rs.5.76 Crs/ MW as the reasonable capital cost for biomass based power plants with water cooled condenser, including evacuation cost and applicable taxes, for the control period 2018-19 to 2020-21, without any indexation.

For the biomass based power plants with Air Cooled condenser, the Commission had earlier approved a capital cost, which was Rs.10 Lakhs more than that for water-cooled condenser power plants. **Keeping in view, the**

capital cost approved by other SERCs, the Commission decides to reckon Rs.5.86 Crs/ MW, as the reasonable capital cost for biomass power plants with air cooled condenser, including evacuation cost and applicable taxes, for the control period 2018-19 to 2020-21, without any indexation.

ii. Plant Load factor:

The Commission had proposed a PLF 75%.

a. Comments of stakeholders/Interested Persons:

M/s Koppal Green Power has stated that the PLF which was about 70% earlier has dropped to 32% in the last two years, due to escalation in fuel cost. It has stated that the PLF in FY17 was about 50% and in FY18 upto December 2017 it was about 15%.

b. Commission's views and Decision:

The Commission notes that the stakeholder has not specifically commented on the PLF but has attributed the reduction in PLF due to increase in fuel cost. The availability of fuel is not clear from the statement made. Further, it is noted that while determining Generic Tariff, the Commission cannot rely on PLF of only one plant.

The Commission notes that the PLF adopted by, the CERC in its Order dated 28.01.2018 is 80% (after the stabilisation period) and other SERCs is in the range of 75% to 80%. **Therefore, the Commission decides to continue the PLF at 75% for the control period FY 2019-2021.**

iii. Auxiliary Consumption:

The Commission had proposed an auxiliary consumption of 10%.

a. Comments of stakeholders/Interested Persons:

Based on their 10 years' experience, the stakeholders have stated that the actual auxiliary consumption is 13%, which should to be considered.

b. Commission's Views and Decision:

The auxiliary consumption approved by other States (except Rajasthan) referred to in the Consultation Paper, is 10%, irrespective of the technology adopted. The CERC, in its Order dated 28.03.2018, has approved 11% during the 1st year of operation and 10% from 2nd year onwards for water cooled condenser projects and 13% during the 1st year of operation and 12% from 2nd year onwards for air cooled condenser projects. **Keeping the above facts in view, the Commission decides to reckon 10% of energy generated towards auxiliary consumption, irrespective of the technology adopted.**

iv. O & M expenses:

The Commission had proposed to adopt 5% of the capital cost as allowable O&M expenses in the base year FY19 for biomass power plants with water cooled condenser and 4% of the capital cost for power plants with air cooled condenser, with an annual escalation of 5.72%.

a. Comments of Stakeholders/Interested Persons:

Koppal Green Power Ltd., has stated that O & M contractors are demanding 10% annual increment and the actual increase is 8% due to use of alternative fuels, fuel handling and replacement of boiler parts. Hence O & M escalation should be considered at 8%.

b. Commission's Views and Decision:

The Commission notes that the stakeholder except for making submission on escalation rate, has not commented on the base year O&M expenses proposed by the Commission, **Therefore, the Commission decides to adopt 5% of the Capital Cost [CC] as the allowable O & M expenses in the base year FY19 for biomass power plants with water cooled condenser and 4% of CC for biomass power plants with air-cooled condenser.**

Regarding the escalation factor, the Commission notes that CERC in its recent tariff Order has adopted 5.72% as the escalation factor. Most of the State Commissions also have adopted escalation at 5.72%. **Thus, the Commission is of the opinion that the escalation of 5.72% is reasonable, keeping in view the present inflation rate. Therefore, the Commission approves an escalation of 5.72% per annum for allowable O & M expenses.**

v. Specific Fuel Consumption(SFC):

The Commission had proposed to adopt specific fuel consumption of 1.21/Kg/Kwh for biomass power plants with water cooled condenser and 1.18 kg/Kwh for plants with air cooled condenser.

a. Comments of stakeholders/Interested Persons:

Koppal Green Power Ltd, has stated that, Fuel Consumption as per ATE's Order based on CEA Report, is 1.36 kg/unit on dry basis. However, on as received basis, the fuel has moisture content and therefore specific fuel consumption is increasing. The Fuel consumption based on its plant experience is 1.40 kg/unit. Hence, SFC should be considered at1.40 kg/unit.

b. Commission's Views and Decision

The Commission, notes that Koppal Green Power Ltd., has not furnished any documentary evidence to substantiate its stand. Further, while determining the generic tariff, the Commission cannot rely upon SFC of one Plant. The Commission notes that the specific fuel consumption varies between 1.12 and 1.35 kg/unit across the States. Hence, the Commission decides to continue **specific fuel consumption of 1.21 kg/kWh for biomass power plants with water cooled condenser and 1.18 kg/kWh for plants with air cooled condenser.**

vi. Fuel cost:

The Commission had proposed to adopt a fuel price of Rs.2500/MT for all biomass based power plants.

a. Comments of Stakeholders/Interested Persons:

Koppal Green Power Ltd., has stated that, the Fuel cost has increased due to drought and non-availability. Therefore, PLF which was 70% earlier in FY16 has come down to 32% in the last two years and in FY18 the PLF is only 14.92%. That, this indicates the problem faced by the industry. That in the last three years the fuel cost has increased by 10% and the current rate is Rs.3600/MT. Based on a few fuel invoices furnished, it has requested to fix the fuel cost at Rs.3600/MT with 10% annual escalation.

Auric Industries Ltd., has requested that, the Commission may consider minimum Fuel Cost of Rs.3000/ton, as GST is imposed on Fuels like bagasse, woodchips, etc and on transportation of fuel.

b. Commission's Views and Decision:

The Commission notes that the submissions made indicates that the price rise is attributed to non-availability of fuel due to drought. The Commission is of the view that occurrence of drought depends upon nature and is not a repetitive continuous phenomena and such risks are to be borne by the developers of biomass plants. Eventhough one of the stakeholders has claimed that GST is being imposed, the Commission notes that in the bills produced by Koppal Green Power Ltd., the GST is indicated as 'nil'. Further the bills are produced for the months of October, November and December of 2017, which cannot be used to arrive at the actual cost for fuel for the whole year. The stakeholders have not substantiated their stand by producing audited data of fuel cost. Nevertheless, the Commission cannot consider the fuel cost of a single plant while determining the generic tariff of all similar plants.

In view of the above, the Commission decides to allow fuels cost as proposed at Rs.2500/MT in the base year 2018-19 for biomass power plants whether with water cooled or air cooled condenser, which shall be escalated at 5.72% per annum.

In the light of the above discussions and considering the approved parameters, the Commission hereby approves the tariff in respect of Mini-Hydel, Bagasse based Co-generation and Rankine cycle based Biomass Power Plants as follows:

Parameter	Mini-Hydel Projects	Bagasse based Co-generation Power Plants	Rankine cycle based Biomass-Power plants with Water Cooled condenser	Rankine cycle based Biomass Power Plant with Air cooled condenser
Debt: Equity	70:30	70:30	70:30	70:30
RoE	14%	14%	14%	14%
Income Tax on RoE	Pass through	Pass through	Pass through	Pass through
Interest on term loan	10.50%	10.50%	10.50%	10.50%
Depreciation	5.38% for first 13 years and balance spread equally over the life of the plant	5.38% for first 13 years and balance spread equally over the life of the plant	5.38% for first 13 years and balance spread equally over the life of the plant	5.38% for first 13 years and balance spread equally over the life of the plant
Interest on WC	11.50%	11.50%	11.50%	11.50%
Capital Cost[CC] - Rs.Crs./MW	6.33	4.70	5.76	5.86
O& M as percentage of CC for base year	14.66 Lakhs/MW in FY19	3.0%	5%	4%
O & M annual escalation	5.72%	5.72%	5.72%	5.72%
PLF	30%	60%	75%	75%
Auxiliary	1%	8.50%	10%	10%
Specific Fuel consumption-Kg/kWh	Not applicable	1.60	1.21	1.18
Fuel Cost-Rs./MT-Base year	Not applicable	1039	2500	2500
Discount Factor (WACC)	11.55%	11.55%	11.55%	11.55%
Tariff	**Levelized for life of the Projects:** Rs. 3.95/unit	**Fixed cost-Levelized for life of the Projects:** Rs.1.77/unit **Variable cost [Rs/Unit] applicable to the relevant year**: FY-19: Rs.1.82 FY-20: Rs.1.92 FY-21: Rs.2.03	**Fixed cost-Levelized for life of the Projects:** Rs.2.19/unit **Variable cost [Rs/Unit] applicable to the relevant year:** FY-19: Rs.3.36 FY-20: Rs 3.55 FY-21: Rs.3.76	**Fixed cost-Levelized for life of the Projects:** Rs.2.07/unit **Variable cost [Rs/Unit] applicable to the relevant year:** FY-19: Rs.3.28 FY-20: Rs.3.47 FY-21: Rs.3.66

9. Date of effect of this order and Applicability:

i) The tariff as determined by the Commission in this Order shall be applicable to all new Mini-hydel, Bagasse based co-generation and Rankine cycle based Biomass power projects that enter into PPA with any ESCOM after the date of this Order and get commissioned during the period between 01.04.2018 and 31.03.2021. The levelised tarif for new Mini-hydel projects and the fixed tariff for new Bagasse based co-generation and Rankine cycle based Biomass power projects determined in this Order shall be applicable for the term of the PPA.

ii) The variable tariff determined by the Commission in this Order for Bagasse based co-generation and Rankine cycle based Biomass power projects shall be applicable for the period between 01.04.2018 to 31.03.2021. Further, the variable tariff determined by the Commission in this Order for Bagasse based co-generation and Rankine cycle based Biomass power plants, shall also be applicable to the existing plants. Such variable cost for Bagasse based co-generation power projects for the next control period beginning from 01.04.2021, shall be determined afresh.

iii) However, in the case of Biomass Power plants with air cooled condenser, the variable cost as determined in the Order dated 10th July, 2014 in OP No.18/2013 shall be applicable for the plants commissioned during the period from 01.04.2014 to 31.03.2018.

iv) The variable tariff determined in this Order, shall be applicable to the units of Koppal Green Power Ltd., and Poweronicks Limited also, for whom the tariff was determined in the Commission's Order dated 22.01.2015 in OP No. 8/2013. The Commission, in the said Order, has considered average fixed cost norm of Rs.1.81 per kWh, for the first ten years of the Petitioners' units. In case, the above units have completed ten years after commissioning, the concerned ESCOM or the generator shall file a petition for re-determination of fixed costs afresh.

v) Any necessary amendments to the standard formats of PPA pursuant to this Order shall be incorporated while executing the PPA.

vi) This Order shall not be applicable to those projects where the Commission has determined the tariff by specific orders [including medium term purchase from co-generation power plants] pursuant to any petitions filed before the Commission. In such cases, the Tariff determined in those Orders shall be applicable.

vii) This Order shall come into effect from 01.04.2018 and shall be in force till 31.03.2021 or until further orders.

This order is signed, dated and issued by the Karnataka Electricity Regulatory Commission on this 14th day of May, 2018.

Sd/-	Sd/-	Sd/-
(M.K. SHANKARALINGE GOWDA)	(H.D. ARUN KUMAR)	(D.B. MANIVAL RAJU)
CHAIRMAN	**MEMBER**	**MEMBER**

Annexure-1

List of persons who submitted written comments/views/suggestions

I. South Indian Sugar Mills Association(Karnataka)-SISMA

II. NSL Sugars Ltd.,

III. Koppal Green Power LTd.:

IV. Auric Industries Ltd.,

V. Renewable Energy Developers Association of Karnataka -REDAK:

VI. Mangalore Electricity Supply Company- MESCOM

VII. Central Electricity Authority-CEA

Annexure-2

List of persons who made oral submissions during Public hearing

I. Sri. Sridhar Prabhu, Counsel for the SISMA

II. Sri N.S. Parthasarthy of Sri Chamundeshwari Sugars Ltd

III. Sri Amarnath H.V. of NSL Sugars

IV. Sri Dhanpal of EID (P)Ltd