

DETERMINATION OF TARIFF FOR BAGASSE BASED COGENERATION PLANTS DURING OFF SEASON USING COAL AS FUEL

1. Preamble:

Bagasse based cogeneration plants generate electricity using bagasse as fuel during their operating season [when sugar is produced] and during off-season with the available surplus bagasse. Due to the limited availability of bagasse during off-season, the plants often remain idle without generating electricity for want of fuel. In this context, to optimally utilize the available electrical capacity from cogeneration plants, the Commission had issued a discussion paper titled "UTILISATION OF BAGASSE BASED COGENERATION PLANTS DURING OFF SEASON USING COAL AS FUEL".

In response to the above paper, Government of Karnataka, BESCOM, CEA, SISMA, Shri Renuka Sugars and Consumer care Society have furnished their Comments. The Comments of Stakeholders in brief, are enclosed at annexe-1 to this paper.

In the light of the replies received from various stakeholders, the Commission invites comments on the various parameters to be considered for determination of tariff for Bagasse based Cogeneration Plants during off season using coal as fuel.

The Parameters to be considered are discussed in the following paragraphs:

2. Parameters for determination of tariff

I. Technical:

1. Calorific value of fuel:

Most of the modern Cogeneration units adopt multi-fuel boilers, which are capable of using biomass fuels other than bagasse or coal [imported or local]. In case coal is used, the calorific value

depends upon the blend of imported coal and indigenous coal.

Regarding the ratio of imported coal to indigenous coal in the blend, Stakeholders have suggested the following:

Organization	Imported Coal to indigenous Coal
BESCOM	30:70
Shri Renuka Sugars	50: 50
SISMA	100:0

Since, a generic tariff is proposed to be determined; **the Commission proposes a blend of 50:50 so that the risk of availability of fuel as well as the tariff impact on end consumers is minimised.**

The calorific values of coal suggested by stakeholders in response to the earlier discussion paper are indicated below:

Organization	Imported Coal- kcal/kg	Indigenous Coal- kcal/kg
BESCOM	5300-6200	3800-4000
Shri Renuka Sugars	5600	4500
SISMA	5600	3800-4200

The calorific value of indigenous coal depends upon the grade of coal used. There are seventeen grades of coal with calorific values ranging from 2200 k.cals. to above 7000 k.cals.

Since, the stakeholders have suggested calorific values for indigenous coal ranging from 3800-4500 kcal/kg, with a median value of 4100 kcal/kg, **the Commission proposes a**

calorific value of 4100 kcals/kg for indigenous coal for the purpose of determining tariff.

Similarly, the stakeholders have suggested calorific values for imported coal ranging from 5300-6200 kcal/kg, with a median value of 5600 kcal/kg, **the Commission proposes a calorific value of 5600 kcals/kg for the purpose of determining tariff.**

2. Heat rate:

The heat rate suggested by stakeholders in response to the earlier discussion paper is indicated below:

Organization	Heat rate- kcal/kWh
BESCOM	2980-3983
Shri Renuka Sugars	3600-3800
SISMA	3360
CEA	4000

It is generally observed that the heat rate for smaller capacity plants would be higher compared to that of conventional plants using coal. Most of the cogeneration plants in Karnataka have capacities in the range of 10-30 MW.

Literature survey indicates that heat rate varies from 3399 to 3150 kcal/kWh for the plants of capacity in the range of 10-30 MW, with the median value of 3269 kcal/kWh for 20 MW plant. **Thus, the Commission proposes a heat rate of 3269 kcal/kwh for the purpose of determining tariff.**

3. Plant load factor for off season

The PLF for off season operation would be different when compared to the regular operating season, as the

maintenance period is already accounted during the PLF estimation for the Season period.

The PLF suggested by stakeholders in their response to the earlier discussion paper is indicated below:

Organization	PLF
BESCOM	90%
Shri Renuka Sugars	75%
SISMA	80%

The Commission is of the view that during off season the PLF should be higher as there is no maintenance period involved.

As such, the Commission proposes a PLF of 85% during off season, for the purpose of determining tariff

III. Financial :

1. Capital Cost:

The Commission notes that the Capital Cost of the plant is already accounted while determining generic tariff for cogen plants. I.e. the capital cost is sunk.

Thus the Commission proposes not to allow any additional depreciation, interest and finance charges including RoE?

2. O & M expenses:

In response to the earlier discussion paper, M/s Renuka sugars has indicated the need for additional O & M costs, but they did not furnish any details. SISMA has suggested that the O & M expense has to be increased from the existing 3% to 5% of the Capital Cost. BESCOM has suggested that additional O & M expenses are not required as the existing establishment can take care of the plant in off-season also.

Since the plant is operated off-season, there would be additional O & M costs in terms of A & G expenses, Employee cost and R & M expenses. **Thus, the Commission proposes to continue the existing 3% of Capital Cost as O & M expenses with annual escalation of 5% for off season also.**

3. Working capital:

The Commission in its earlier paper had invited comments as to whether two months receivables as working capital are adequate?

While BESCO opined that additional working capital is not required, M/s Renuka Sugars was in favor of 3- months receivables as Working Capital. SISMA has suggested that in addition to 2-months receivables, one month coal cost needs to be factored for working capital.

The Commission proposes 2-months receivables corresponding to the off-season as the working capital. Since, the receivables corresponds to the off-season, it covers all the expenses incurred during off-season including that of coal.

4. Fuel Cost:

Fuel Cost during the off-season period depends upon the fuel mix of imported coal and indigenous coal.

The Commission proposes to adopt the rates notified by Coal India Limited [CIL] from time to time for indigenous coal. For imported coal, the Commission proposes to adopt CERC's composite index as notified from time to time for determining the price of coal.

5. Incentive for off-season generation:

Since there is no additional RoE available for generation in off-season, incentives for generation during off-season has to be provided.

Thus, the Commission proposes to have a generation based incentive [GBI] .

Alternatively, it is proposed to retain the first year tariff as applicable for bagasse based operation during season, so that the generators would earn an additional amount equal to 0.8% of RoE.

The Commission seeks comments as to whether GBI scheme is to be introduced or the first year tariff applicable for seasonal operation is to be made applicable for power generated during off-season and in case GBI is to be introduced what should be the amount of GBI in paise/unit.

The comments and views on the above issues shall be sent to the Secretary, KERC latest by 31.12.2013.

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