

**Comments of stake holders on the discussion paper on utilization of Bagasse based co-generation plants during off-season using Coal as fuel.**

Questions raised by the Commission	BESCOM's Reply	CEA'S Reply	GOK	Shri Renuka Sugars Ltd.,	SISMA	Consumer Care Society
<p><b><u>I. Applicability:</u></b></p> <p>The tariff to be determined by the Commission for use of coal shall be made applicable to the existing PPA holders as well as new generators who enter into PPA with the licensees.</p> <p><b>Whether the above applicability is acceptable?</b></p>	<p>Season &amp; Off-season to be clearly defined.</p> <p>Coal usage during season to be limited to 15% of total consumption during season</p> <p>Tariff during season to be the preferential tariff determined by the Commission.</p> <p>Maximum generation during season with reference to previous year has to be maintained.</p>	<p align="center">--</p>	<p>GOK has stated that SISMA – the Apex body of Sugar factories has submitted its comments. The Karnataka State Federation of Co-operative Sugar Factories while concurring with SISMA's view has stated the matter relates mostly to technical parameters and some basics of economics common to all the co-gen units having multi fuel boilers, and there could be no two opinion on the matter. However, a system of dual and equitable tariff separately for the power generated using Bagasse and Coal should be put in place. Further, it is stated Sugar Directorate has endorsed the views of SISMA and Federation of Co-operative Sugar factories.</p> <p>The Government has stated that out of 57 Sugar factories, 38 have co-gen facility. Since the matter is technical, GOK has suggested to have a joint meeting with Co-operative and private Sugar factories.</p>	<p>Acceptable</p>	<p>To be applicable to existing as well as new generators.</p>	
<p><b>What should be the net power output to be considered for off-season operation expressed as percentage of</b></p>	<p>Based on the data of six sugar mills, BESCOM has recommended that during off-season export could be 20% more.</p>	<p align="center">--</p>		<p>Power output would be same during season and off-season.</p>	<p>The net power output during off season would be around 85% (auxiliary 10%) of capacity.</p> <p>As per the steam and power balance cycle for high pressure</p>	

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net power output during season?					co-gen plants, about 80 units of surplus/exportable power can be generated from each MT of cane crushed, after meeting process steam and power requirements of the sugar mill. It is suggested that the output shall be as follows : 1. During season : a. From Bagasse : 80 units/MT of cane crushed. b. From Coal : Addl. Units beyond 80 units/MT  2. During off season : Entire unit by Coal.	
In case coal is used, whether the boiler is designed for 100% imported coal or some percentage blend is also to be considered.  <b>What should be the normal blend of imported &amp; indigenous coal and the corresponding calorific value of Coal to be considered?</b>	CEA has advised power project developers to have boilers designed for 30:70 ratio for imported and indigenous coal. Thus, BESCOM has recommended blend ratio of 30: 70.  BESCOM has indicated calorific value in kcal/kg of 5300-6200 for imported coal, 3800-4000 for indigenous coal and 3600-3800 for bagasse.	--		Boiler is designed for 100% MCR on Bagasse, 85% MCR on imported Coal and 70 to 75% MCR on indigenous Coal.  Blend shall be 50:50 for indigenous and imported Coal.  Calorific value for imported Coal is 5600 K.cal/kg and for indigenous Coal it is 4500 k.cal/kg on dry basis.	Multi fuel boilers presently used are capable of burning both imported and indigenous Coal.  Calorific value of indigenous Coal is around 3800 to 4200 k.cal/kg at the rate of Rs.4400/MT and that of imported Coal is 5600 k.cal/kg at Rs.5200/MT.  It is stated that there is difficulty in obtaining indigenous Coal due to non-availability and hence imported Coal may be considered for fixing the tariff.	
<b>What should be the heat rate for off-season operation using coal? Also, what should be the norms for boiler efficiency and</b>	Heat rate depends upon operating pressure and temperature. In Karnataka Cogen plants operate at 67 ksc or 87 ksc and temperatures of 450 degree centigrade to 550 degree centigrade. Thus, heat	Most of the co-gen. plants operate at boiler efficiency of 75 to 80%, pressure 60 ksc to 80 ksc and 480 degree centigrade to 500 degree centigrade for which the heat rate are around 4000 kilo		Heat rate for off-season:3600 to 3800 k.cal/kwh.  Boiler efficiency :  On Bagasse 71% On imported Coal 80%	Heat rate with Bagasse is 3600 k.cal/unit and boiler efficiency is 70%.  For Coal : it is 3360 k.cal/unit at boiler efficiency of 75% (Staff Note: it is not clear whether	The best quality of Coal with high calorific value and minimum ash content should be used.

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turbine efficiency?	rate in the range of 2980 Kcal/kg to 3983 kcal/kg is recommended by BESCOM. Boiler efficiency & turbine efficiency is recommended at 90%.	calorie per KWH.  Co-gen plants use more than one form of energy and thereby achieve overall higher thermal efficiency and make significant contribution to energy conservation.  It is proposed to burn coal in 1740 MW of power plant capacity during off-season without co-gen. Bio-mass based co-gen needs to be encouraged by appropriate incentive mechanism.  <b>Because of lower efficiency of Bagasse based plants during off-season, burning Coal as fuel at lower efficiency and without co-gen is not advisable.</b>		On indigenous Coal 72%	this heat rate is with indigenous Coal or with imported Coal).	
What should be the PLF for off-season generation using coal?	50 to 60% during season and 90% during off-season.			75% during off season	The PLF with only Bagasse is 60% which can be enhanced to 80% with use of Coal.	
The Capital Cost of the plant is already accounted while determining generic tariff for cogen plants. I.e. the capital cost is sunk.  Is it therefore necessary to allow any additional depreciation, interest and finance charges including RoE?	Not necessary.			Additional cost for Coal handling plant is required (Note: no cost is indicated by the firm).	The use of Coal leads to higher wear and tear and therefore additional depreciation, interest on finance charge should be allowed. (Staff Note: cost pertaining to wear and tear should be covered under repairs and maintenance and not in CAPEX).	

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Since the plant is operated off-season, would there be additional O & M costs? If so, what should be the additional O & M costs?	Not required since the existing establishment can take up O & M works in off-season also.			Additional O & M cost required. The firm has stated that the cost is yet to be determined	Coal handling requires additional O & M costs, as such, O & M expenses needs to be increased from 3% to 5%.	
<b>Whether two months receivables as working capital are adequate?</b>	No additional working capital is required, as two months receivables provided in case Bagasse co-gen plant is sufficient.			Three months receivables required.	In addition to two months receivables, one month Coal cost is also to be included.	
Fuel Cost during the off-season period depends upon the fuel mix of imported coal and indigenous coal.  <b>For the purpose of generic tariff what fuel cost needs to be considered?</b>  <b>In case fuel cost is made as pass through instead of adopting normative cost, then monthly monitoring of fuel mix and cost is essential. In such a case a two-part tariff needs to be introduced, instead of the existing single</b>	Fuel mix cannot be monitored and hence single part tariff to be considered. For the off-season only variable charges to be considered as the existing tariff takes care of season periods as there will be no additional capital cost.  Generator should intimate in advance the proposed energy generated before the start of off-season.  Tariff to be computed for off-season based on generation of power per metric ton of mixed fuel usage with 5% escalation of coal price. During season the existing tariff to be continued.			Pass through mechanism to be adopted.  Two part tariff may be introduced.	Irrespective of the blend, cost of imported Coal shall be adopted for tariff purpose.  Two part tariff may be introduced and the variable cost shall be linked to Coal index.	From the questions posed in the letter it appears that it is the intention of KERC to determine the cost of production individual plant wise as was being done earlier for the large steam and hydro plants to implement the ABT regime and where the tariff was fixed by the regulator. And then to find an acceptable value which could be used in a KERC regulation applicable to all the Bagasse based cogen [BBCs]. The EA2003, to the best of understanding, envisages encouraging competition. Is it not possible to obtain prices at which the BBCs are willing to supply power via the competitive route? It would be necessary, of

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<p>part tariff.</p> <p>Whether a two part tariff structure needs to be introduced for Cogeneration plants with fuel cost as pass through? If yes, what should be the mechanism for monitoring the actual fuel usage?</p>						<p>course, to state the conditions under which the ESCOMs want to buy power so that the bids could be made and a proper comparison would be possible.</p> <p>The foregoing comments provide a possible basis for such conditions to be stated and in fact to the best advantage of the State and also indirectly answers some of the questions posed. This would have the advantage of avoiding answering questions which call for detailed knowledge of BBC plant design and operation. The design parameters adopted by the individual plants would have been determined by the owners at the project development stage.</p>
<p>Since there is no additional RoE available for generation in off-season, incentives for generation during off-season has to be provided. A generation based incentive mechanism may be introduced.</p> <p>What should be the incentive</p>	Not required			<p>Since Coal is expensive incentive of atleast 30% of cost to offset lower efficiencies of the plant while on Coal to be provided.</p>	<p>It is suggested that for tariff calculations using Coal, other assumptions may be kept in line with the existing tariff order and the increased tariff (with Coal) may be permitted for units beyond 80 units/MT of Cane crushed.</p>	

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per unit?						
What happens to the benefits availed or being availed under various RE schemes in case coal is used in off-season?	State Government has announced 25 lakh per MW of exportable surplus. This benefit may be restricted to season period.			The plant may have to forego REC benefits for power generated from coal over and above the cap of 15% as approved by MNRE. The loss of benefits like MNRE subsidies etc need to be compensated to the generator.	RE benefits should be continued as the basic cost of operating with Coal is optimal utilization of resources.	
Other comments					Tariff is to be on a quarterly basis as the tariff is proposed to be linked with Coal index	<p>It needs to be assessed whether co-gen plants are treated as energy producing assets or peak load assets.</p> <p>Total load can be classified into peak, intermediate and base load and each of these should be supplied with type of generation with appropriate characteristics. Such characterization is not available readily for Karnataka. However, it is understood that co-gen plants are well suited for serving peak loads. That means even with limited levels of kwh there could be larger peak load alleviation capability by using co-gen as peak plants.</p> <p>In order to dispatch plants as peak plants, it would be necessary to upgrade the facilities at SLDC as well as at the co-gen plant.</p>

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						<p>It is necessary to evaluate the allocation of fixed costs between steam and electricity consumed in plant and to the power fed to the grid. The pricing should be in terms of capacity charge dependent on capacity made available for dispatch.</p> <p>A discussion with KPTCL, ESCOMs and cogenerators before finalizing the tariff is suggested. PPAs for supplying peak power should be entered into with penalties for not supplying power.</p> <p>Since individual cogens are relatively small a consortium approach could be adopted with PPA entered with consortium.</p>