ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION
4th Floors, Singareni Bhavan, Red Hills, Hyderabad 500 004

O.P.No.39 of 2014 & I.A.No.10 of 2014
Date: 23-05-2015

Present

Sri Justice G.Bhavani Prasad, Chairman
Sri.P.Raghu, Member
Sri.P.Rama Mohan, Member

Between
M/s. Empee Power Company (I) Ltd.,
59 Harris Road, Pudupet,
Chennai – 2 …….. **Petitioner**

AND

1. Andhra Pradesh Power Co-ordination Committee,
2. Transmission Corporation of Andhra Pradesh Limited (APTRANSCO),
3. Southern Power Distribution Company of A.P Ltd., (APSPDCL).. **Respondents**

This Petition has finally come up for hearing on 08-05-2015 in the presence of Sri. Challa Gunaranjan, learned counsel on behalf of the petitioner and Sri. P.Shiva Rao, learned standing counsel for the respondents. After carefully considering the material available on record, the Commission passed the following:

O R D E R

The petitioner has filed original petition u/s 11(2) of the Electricity Act, 2003 and the Conduct of Business Regulations (CBR) seeking determination of tariff/power purchase price in respect of the power supplied by Bagasse based Co-generation projects by using coal during non-crushing period in terms of G.O. Rt. No. 43 Energy (Power-II) Department dated 13-03-2014.

2. The averments of the petitioner in the said petition are as hereunder:

   a. The petitioner is a company incorporated under the provisions of the Companies Act, 1956 engaged in the business of Manufacture and Sale of electricity. The petitioner company has established a Bagasse based Co-

generation Plant with a capacity to generate 20 MW of power. The petitioner company has entered into Power Purchase Agreement dated 23-05-2007 with the 3rd Respondent. The Electricity Act, 2003 was brought into force with effect from 10-06-2003. Under the provisions of the Electricity Act, 2003, it was not permissible for APTRANSCO as the State Transmission Utility to engage in activities of trading in electricity. Consequently, the State Government notified the Third Transfer Scheme in G.O.Ms.No.58, Energy (Power-III) dated 7-6-2005 in exercise of the powers conferred by the Reform Act, whereby the generating capacities of the non-conventional energy stations including all obligations of APTRANSCO to purchase unallocated energy from the non-conventional energy stations stood allocated and transferred by operation of law to the various DISCOMs. Consequently, purchase of surplus energy in respect of the Petitioner's power plant which was hitherto vested in APTRANSCO stood severed, transferred and vested in the Respondent 3.

b. Parliament enacted the Electricity Act, 2003 with the object of consolidating and amending the laws relating to the regulation of electricity, and repealing the Electricity Act, 1910 and the Electricity (Supply) Act, 1948, and the Electricity Regulatory Commissions Act, 1998 and also superseding the provisions of the State Reform Act which are inconsistent with the provisions of the Electricity Act, 2003. In the Electricity Act, 2003, it is contemplated that generation of electricity be freed from regulation substantially and the renewable sources of energy have been given mandatory promotion and protection. There is mandatory purchase by the Distribution Licensees of a minimum amount of the consumption in their local areas from renewable energy sources at tariffs to be determined by the State Commission upon application by the generating company. The Electricity Act, 2003 was brought into force with effect from 10-06-2003.

c. The Commission in terms of order dated 20-06-2001 in O.P. No. 1075 of 2000 has undertaken review of incentives including purchase price to be given effect from 01-04-2004 in respect of Non-Conventional Energy Projects. Accordingly, vide orders dated 20-03-2004 in R.P. No.84 of 2003 in O.P. No.1075 of 2000 this Commission fixed purchase price of power from New and Renewable Energy Projects. The purchase price thus fixed consisted of fixed cost and variable cost. The fixed cost is determined for

a period of ten years and the variable cost is fixed for the period from 2004-05 to 2008-09 i.e., for a period of 5 years. In the said order it is also stated that further review of the tariff structure valid for a control period of 5 years shall be reviewed on completion of the said period after consultation with the developers.

d. The Commission has undertaken the process of determining the power purchase / tariff, variable cost and accordingly published a consultative paper on review of tariff/power purchase price (variable cost or single part tariff as the case may be) for the existing new and renewable sources of energy in the state of Andhra Pradesh in respect of projects for which the Power Purchase Agreements have already been executed with the Respondent No.3 and consented by Commission. The Commission after hearing the respective stake holders has, by its order dated 31-03-2009, determined the variable cost in respect of Bagasse based co-generation projects for the years 2009-10 to 2013-14. The petitioner for the present is not concerned either with the power generated during season by using Bagasse as fuel nor the tariff payable on account of supplies made there under.

e. The Government of AP having noticed the severe power shortage in the year 2014 because of increase in demand of power and corresponding generation not meeting the requirement, directed the distribution companies in the State to procure power under short-term purchases through power exchanges. In spite of the same, the demand and supply gap could not be filled up. The Government of AP also noticed the fact that the Bagasse based co-generation projects have been facing shortage of Bagasse due to shortfall in cultivation of sugar cane in general and therefore these co-generation projects were not operating even to the optimum level. Since, these projects could not operate even to recover the fixed charges; they represented to the Government to allow usage of coal as fuel during non-crushing period and also to permit for open access. The Government after consulting the Distribution Companies has denied the request to permit for open access for the reason that the developers have already entered into power purchase agreements with Distribution Companies and therefore obligated to supply entire energy to DISCOMs only. However, the request for usage of coal as fuel during non-

crushing period was considered favourably in view of large gap in the demand and supply in the State. The Government, therefore, to overcome the power shortage and in the interest of general public decided to utilize the idle capacity of the co-generation projects during non-crushing season by permitting the co-generation projects to operate, maintain and generate to full capacity by using coal as fuel upto 15th November 2014 and supply power to Distribution Companies. Accordingly, the Government exercising the powers conferred under Section 11 of the Electricity Act, 2003 issued G.O.Rt. No.43, Energy (Power-II) Department dated 13-03-2014 directing the co-generation projects to operate the projects to full capacity by using coal as fuel and supply the said power to respondents and further directed the respondents to pay the tariff as is in force and also pay additional amounts as per the orders that may be passed by this Commission under section 11 (2) of the Electricity Act, 2003.

f. The petitioner proposes to commence generation of power by using coal as fuel during the non-crushing season in terms of the order issued by Government. As per point No. 4 of the G.O., the Secretary, APERC has to intimate the compensation payable. As there is no tariff fixed for generation of power by co-generation projects using coal as fuel, the petitioner is constrained to approach this Commission to fix the tariff.

g. The Commission in various proceedings concerning fixation of tariff has outlined the factors needed to be considered in the process of determination of variable cost. Even with respect to the previous years, the Commission has determined the compensation by fixing appropriate tariff for power generated using coal as fuel. These factors are (a) Auxiliary power consumption (b) Cost of fuel (c) Heat rate of the plant (d) Calorific value of the fuel (e) Interest on working capital (f) Fixed Cost (g) Transmission Line Maintenance Expenses (h) Payment of Electricity Duty etc.

h. The petitioner made the following submissions in support of the rate that is sought to be fixed by the Commission.

i)	Auxiliary Power Consumption	:	10.00%
ii)	Cost of Coal	:	* Rs.4,300/- per Tonne plus
	VAT @ 5%	:	Rs.215/- per Tonne
	Transportation Cost	:	Rs.310/- per Tonne
	Unloading Charges	:	Rs.50 per MT
	Total landed Cost of coal	**:**	**Rs.4,875/- per Tonne**
	Heat rate of the plant	:	4378 kcal / kWh
iii)	Calorific Value of the fuel	:	4338 kcal / kg
iv)	Fixed Cost	:	Rs. 1.39 (As per PPA)
v)	* based on quotation received from M/s. Star Coal supplier of Indonesian Coal.		

vi) Transmission Line Maintenance Expenses of 1 paise per unit being claimed which is not included in the O & M expenses, which is a part of fixed cost. APTRANSCO at present is deducting this amount from export bill.

vii) Payment of electricity duty @ 6 paise per unit. Appellate Tribunal for Electricity have vide their order dated 20-12-2012 allowed electricity duty as pass through. This has to be permitted to be included in the bill.

viii) The threshold limit of 55% PLF for payment of fixed cost should not be applied to units generated and exported using coal during non-crushing season. All units generated and supplied to the grid by using coal as fuel shall be paid for both fixed and variable costs.

i. The petitioner therefore prays that the Commission may be pleased to

i) fix the tariff as `7.20 per unit for generation and supply of power from the petitioner's co-generation power plants to the respondents by using coal as fuel;

ii) direct the respondents to pay `7.20 per unit for the power generated and supplied by the petitioner's co-generation plants using coal as fuel during non-crushing season.

iii) pass such other order or orders as this Commission may deem fit and proper in the circumstances of the case.

3. The material averments made in the reply filed by the respondents 1 to 3 are briefly as follows.

a) The Govt. of AP (GoAP) vide G.O.Rt.No.43 dated 13-03-2014 under Section 11 of the Electricity Act, 2003 permitted all sugar mills having co-generation facility capable of running with coal to generate power using coal as fuel during the non-crushing season from the date of issue of orders till the start of next crushing season and supply to DISCOMs at the rate fixed by APERC.

b) The Commission determined the threshold PLF limit as 55% for Bagasse based co-gen projects by the time those projects would recover their fixed cost. As such, the fixed cost may not be payable beyond the threshold limit of 55% even with usage of coal. The Commission in orders dt. 27.07.2010 in O.P. No.37 of 2009 between M/s. Vemagiri and DISCOMs allowed difference in additional variable cost incurred by generating company due to GoAP (section 11) directions and stated that fixed cost shall be paid as per PPA only.

c) The parameters adopted by Commission for determination of variable cost for Bagasse co-gen projects are mentioned below:

Parameter	**APERC Order dated 16-05-2014**
Station Heat Rate (SHR) in kcal/kWh	3600
Auxiliary Consumption (AC)	9%
Gross Calorific Value (GCV) of bagasse in kcal/Kg	2250
Specific Fuel Consumption (SFC) in Kg/kWh as SHR/GCV	1.60

d) The impact of coal usage on Station Heat Rate and Auxiliary Consumption is examined as detailed below:

Station Heat Rate (SHR)

Station Heat Rate (SHR) is defined as the heat energy input in kcal required to generate one kWh of electrical energy at generator terminals.

Station Heat Rate (SHR) of thermal projects is indicated below:

Category	SHR (Kcal kWh)	
	CERC	APERC
Thermal Power Plants	2500	2500

The thermal plant's SHR is lower than Bagasse plant's SHR

The Station Heat Rate (SHR) is determined by the formula:

{Turbine Heat Rate (kcal / kWh) / Boiler efficiency} / Generator capacity

The Boilers in most of the Bagasse co-gen projects are designed and constructed for multi fuel firing i.e., Coal and Bagasse / Biomass and other agri-waste fuels. The Bagasse projects which have facility of multi fuel firing have commenced generation with coal immediately after GoAP orders were issued. Remaining projects, which do not have such facility of multi fuel firing did not generate power with coal.

The variation in usage of fuel will impact the Boiler efficiency.

The Boiler efficiency is given by:

Boiler efficiency = 100 - losses in Boiler

The Boiler losses are:

(i) heat loss in dry flue gases
(ii) heat loss due to moisture in fuel
(iii) heat loss due to burning of hydrogen in fuel
(iv) heat loss due to radiation
(v) heat loss due to un-burnt fuel

The heat loss due to moisture and burning of hydrogen depends on type of fuel used and can be calculated by the formulas mentioned below

Heat loss due to Hydrogen:

$$\frac{9 \times H2 \times \{584 + Cp\,(Tf-Ta)\} \times 100}{\text{GCV of fuel}}$$

H2 - kg of H2 in 1 kg of fuel
Cp – Specific heat of superheated steam (0.45 kcal/kg ^{O}C)
584 – Latent heat corresponding to the partial pressure of water vapor
Tf - Flue gas temperature in ^{O}C
Ta - Ambient temperature in ^{O}C

Heat loss due to Moisture:

$$\frac{M \times \{584\ Cp\ (Tf - Ta)\} \times 100}{\text{GCV of fuel}}$$

M – kg of moisture in 1kg of fuel

The characteristics of imported coal and bagasse are provided below:

Parameter	Indonesian Coal, %	Bagasse, %
Moisture	9.43	40
Mineral Matter	13.99	--
Carbon	58.96	23.5

Parameter	Indonesian Coal, %	Bagasse, %
Hydrogen	4.16	3.25
Nitrogen	1.02	--
Sulphur	0.56	--
Oxygen	11.88	21.75
GCV	5500	2272 (about 2300)

The Gross Calorific Value (GCV) of imported coal is much higher than Bagasse and the Moisture content of coal is less compared to Bagasse. As such, the Boiler losses due to coal shall be less compared to Bagasse resulting in reduction of Station Heat Rate (SHR).

The Commission also vide order dated 06-08-2013 in O.P.No.41 of 2013 during determination of tariff in respect of power supplied by Bagasse based co-generation projects by using coal during non-crushing period for 2013-14 year, while noting that high heat rate is also due to not maintaining the plants efficiently, extended the SHR given to Bagasee plants viz., 3700 Kcal / kWh to the plants with usage of coal as fuel also.

Therefore, the petitioners request for consideration of higher SHR need not be accepted. The Commission may extend the SHR of 3600 Kcal / kWh as is given presently to Bagasee developers, to the power generated using coal also.

e) Auxiliary Consumption (AC)

The usage of coal cannot have any impact on Auxiliary Consumption (AC) as these plants are already designed and installed with equipment required for firing of coal. The Auxiliary Consumption (AC) adopted by APERC is already higher than CERC norm.

Also the Commission in its earlier orders dated 06-08-2013, while determining the power purchase price in respect of power supplied by Bagasee based co-generation projects by using coal in

O.P.No.41 of 2013, adopted Auxiliary Consumption of 9%. As such the request of the petitioner for higher Auxiliary Consumption of 10% is not justified and it is requested to adopt the Auxiliary Consumption of 9% only.

f) Gross Calorific Value (GCV) & Fuel Cost

The price of the coal is directly proportional to the gross calorific value. The GCV proposed by the petitioner is 4338 KCal/kg. The GoAP issued orders dated 13-03-2014 permitting all sugar mills having co-generation facility capable of running with coal to generate power using coal as fuel during non-crushing season from the date of issue of orders till the start of next crushing season and supply to DISCOMs at the rate fixed by the APERC. The GoAP did not specify the kind of coal to be utilized. However, the petitioner has opted to utilize the higher priced Indonesian coal for generation of power as per GO dated 13-03-2014. As such, the risk of the developer's option for utilizing higher purchase price Indonesian coal shall not be passed on to APDISCOMs, which in turn will unduly burden the end consumers. Further, the coal price requested by the appellant is based on the quotation from M/s. Star Coal India (P) Ltd., and the same cannot be relied upon since the quotation is not authenticated. Hence, the Commission is requested to peruse the original receipts/bills from the coal supplier throughout the period of generation using coal. In addition, the appellant has claimed GCV of 4338 KCal/kg for the coal utilized for power generation at 4875/MT (inclusive of transportation and VAT). It is ascertained that the basic price/tonne with GCV ranging from 4301 to 4600 from the Singareni Collieries Company Ltd., is as follows:

GCV grade of coal	GCV Range (KCal/kg)	ROM Coal `/MT	Steam Coal `/MT	Slack Coal `/MT	Crushed ROM Coal `/MT
G 10	4301 to 4600	2100	2430	2130	2190

As seen from the above, the maximum price for the coal with GCV of 4338 K Cal/kg is `2430/MT, and adding 20% (say) towards other charges viz., transportation, VAT etc., the coal price comes to around `3000/MT. With this coal price and GCV, the variable cost comes to `2.73/unit. If the eligible fixed cost of `1.39/unit (the CoD of the plant is 12-03-2010 and the plant is in 5th

year of operation) is added, the total comes to `4.12/unit. As per the quotation furnished by the petitioner, the GCV is 5000 KCal/kg and with this the variable cost comes `3.50/unit and the total cost comes to `4.89/unit (`3.50+`1.39). Even otherwise APPCC is purchasing power from other developers generating power using imported Indonesian coal under short term basis at `5.45/unit. As such Commission may determine the purchase price with a variable cost of `2.73/unit and the total cost of `4.12/unit.

4. The petitioner also filed a rejoinder to the counter filed by the respondents on 29-01-2015 and the averments contained therein are as here under:

a. **Station Heat Rate: (SHR):** Commission itself extended the SHR at 3700 KCal/kWh in its orders for the previous years and the respondents are not justified in suggesting the SHR at 3600 KCal/kWh. The SHR of the petitioner is 4378 KCal/kWh and 3600 KCal / kWh was never the SHR of the petitioner. If the suggestions of respondents are taken into account, the petitioner will be put to great hardship and irreparable loss.

b. **Auxiliary Consumption:** The calculations are actual but not mere paper workings and the same needs to be considered.

c. **GCV & Cost of fuel:** The Government did not specify the type of coal in the GO. The petitioner proposed to generate energy by using less ash content coal suitable for its boiler during non-crushing season. Moreover, when the Government did not specify the kind of coal to be used and the respondents did not object to the same in the previous years, respondents are not justified in raising such contentions at this point of time that too after receiving the energy produced and supplied by petitioner as per the PPA. Singareni coal contains more ash content (30% to 50%) where as Indonesian coal contains low ash which is less than 10%. The petitioner's boilers are suitable and are designed to use less ash content coal and if the high ash content coal is used, the boilers will get damaged. Further, Singareni coal is not available whenever it is required by the petitioner. Hence, if Singareni coal is to be used in the plant it has to be procured in advance in large quantity leading to higher working capital. The determination of tariff/cost of compensation is based on the coal that is actually utilized by the petitioner and not on speculative basis. Imported coal is available at any time and can be brought through

Krishnapatnam port, whenever it is required. Moreover, most of the Bagasse power projects use Indonesian coal but not Singareni coal. The distance from Singareni to the plant is too long and if the transport charges are added to the price of the coal along with taxes, the landed cost will be more than that of Indonesian coal. Coal price may be fixed based on the cost fixed by the Commission in the previous years by increasing it by 5%.

d. **Interest on Working Capital:** In the previous years this Commission granted 7 paise/unit towards interest on working capital and the same has to be added while fixing the tariff.

5. Based on the above, the main issue that needs to be decided by the Commission is the adverse financial impact on the Bagasse co-generation developers in complying with the directions of GoAP under section 11(2) of the Electricity Act, 2003 viz., operating the projects to full capacity by using coal as fuel. In order to decide the adverse financial impact as above, the rate of purchase of power using coal needs to be first determined by the Commission. This, in turn depends upon determination of various parameters that go into fixation of power purchase price. The parameters that need to be determined include Plant Load Factor (PLF), Station Heat Rate (SHR), Gross Calorific Value (GCV), Auxiliary consumption, Cost of fuel etc. That being the case and in view of divergent views expressed by the petitioner and the respondents on the parameters to be adopted, it becomes necessary to determine each of the parameters. The same is embarked upon as under. Further, it is to be kept in mind that, the instant PPA is one which was executed under RPPO dated 27-09-2005 with negotiated tariffs. "Schedule-1A" of the said PPA, stipulates that the fixed charges from the 11th year onwards shall be negotiated but shall not exceed the fixed charges determined by the Commission for Bagasse based power projects from time to time for the corresponding years and the variable charges beyond 2008-2009 shall be negotiated but shall not be higher than the variable charge fixed by the Commission for Bagasse based cogeneration plants from time to time for the corresponding years. It is a matter of fact that, the developer is presently being paid, the variable charge determined by the Commission vide its order in O.P. No.32 of 2014 dated 16-05-2014 applicable for the period from 01-04-2014

to 31-03-2019. An amendment, interalia, to this effect is submitted to the Commission vide APSPDCL letter dated 23-03-2015 and the same is since consented vide Commission's letter dated 28-04-2015. Hence, the parameters determined as under are to be in tune with the underlying parameters given in the above said orders and the amendment made thereafter.

(a) <u>Plant Load Factor (PLF):</u>

On this the petitioner prayed that the threshold limit of 55% PLF for payment of fixed cost should not be applied to units generated and exported using coal during non-crushing season. All units generated and supplied to the grid by using coal as fuel shall be paid for both fixed and variable costs.

In response to this issue, the respondents averred that the Commission determined threshold PLF limit as 55% for the Bagasse based co-generation projects, by which time these projects would recover their fixed cost. As such, the fixed cost may not be payable beyond the threshold PLF limit of 55% even with usage of coal. Further, the Commission in orders dated 27-07-2010 in O.P.No.37/2009 between M/s. Vemagiri and DISCOMs allowed difference in additional variable cost incurred by generating company due to GoAP Section 11 directions and stated that fixed cost shall be paid as per PPA only.

Now the point for the consideration of the Commission is whether fixed charges are to be paid upto 55% PLF only or for the entire units exported. While addressing this issue, it is to be borne in mind that the fixed costs are paid for the assets gainfully employed in the relevant business. Further, as per Commission's Orders, the co-gen developer will be able to recover his full fixed cost at a performance level of 55% PLF itself. The type of fuel used (coal in this case) and the period of generation (non-crushing season) have no bearing on the fixed cost recovery as long as the short-fall in PLF on account of shortage of bagasse is allowed to be compensated duly taking into account, the generation with coal and during the non-crushing season. Hence, the Commission is of the view that fixed cost may be paid upto 55% PLF (the generation using coal during non-crushing season shall also be taken into account for computing the PLF) and thereafter, only incentive needs to be paid. The variable costs are any way payable for all the units supplied to DISCOMs. It is to be kept in mind that paying fixed

charges for the entire units exported, amounts to paying more than the fixed charges, corresponding to the assets gainfully employed and hence, this request of the petitioner can not be accepted.

(b) <u>Station Heat Rate (SHR):</u>

Station Heat Rate is defined as the heat energy input in kilo calories required to generate one kilo watt hour (kWh) of electrical energy at generator terminals.

Regarding this parameter, the petitioner herein has sought for a value of 4378 kcal/kWh. On the other hand, the respondent stated that the station heat rate for coal plants is 2500 KCal /kWh as fixed by both APERC and CERC. The Thermal plant station heat rate is lower than Bagasse plant station heat rate. The boilers in most of the Bagasse co-generation plants are designed and constructed for multi fuel firing i.e, coal and Bagasse / Biomass and other Agri Waste fuels. The Bagasse projects which have facility of multi fuel firing have commenced generation with coal, immediately after GoAP orders were issued. Remaining projects, which do not have such facility of multi fuel firing did not generate power using coal. The variation in usage of fuel will impact the boiler efficiency. The boiler efficiency is computed by deducting losses in boiler from 100. The boiler losses are (i) heat loss in dry flue gases (ii) heat loss due to moisture in fuel (iii) heat loss due to burning of hydrogen in fuel (iv) heat loss due to radiation (v) heat loss due to un-burnt fuel. The heat loss due to moisture and burning of hydrogen depends on the type of fuel used. The moisture content of imported coal is less compared to Bagasse. As such the boiler losses due to coal shall be less compared to Bagasse resulting in reduction of Station Heat Rate. The Commission vide orders dated 06-08-2013 in O.P.No.41 of 2013 on the same issue, while noting that higher Heat Rate is also due to not maintaining the plants efficiently, extended the SHR given to Bagasse plants viz., 3700 KCal/kWh to the plants with usage of coal as fuel also. Therefore, the petitioner's request for consideration of higher SHR need not be accepted and the Commission may extend the SHR of 3600 KCal/kWh presently being given to Bagasse developers to the power generated using coal also.

The petitioner in the rejoinder stated that the Commission itself extended the SHR at 3700 KCal/kWh in its orders for the previous years and the respondents

are not justified in suggesting the SHR at 3600 KCal/kWh. The SHR of the petitioner is 4378 KCal/kWh and 3600 KCal / kWh was never the SHR of the petitioner. If the suggestions of respondents are taken into account, the petitioner will be put to great hardship and irreparable loss.

Commission has examined the issue. The SHR of coal based plants is much less than Bagasse based power plants since the boiler losses due to coal are less compared to Bagasse and is pegged at 2500 KCal/kWh. A higher Station Heat Rate is also mainly due to not maintaining the plants efficiently. A station heat rate of 3600 KCal/kWh (if not less) fixed for Bagasse based plants may be extended to the plant with usage of coal as fuel since it is much higher than 2500 KCal/kWh given to coal based power plants. Further, through the recent amendment dated 19-03-2015 in the PPA submitted to and approved by the Commission, the developer has tacitly agreed for the heat rate of 3600 KCal/kWh in as much as the present variable cost included in the amendment is worked out based on 3600 KCal/kWh only in the order of the Commission in O.P.32 of 2014, dated 16-05-2014 for the period from 01-04-2014 to 31-03-2015. As such the commission hereby allows a Station Heat Rate of 3600 Kcal/kwh.

(c) <u>Gross Calorific Value (GCV) & Cost of Fuel</u>

The petitioner adopted a GCV of 4338 KCal/kg and adopted a total landed cost of `4875/MT (base price of `4300/tonne + 5% VAT of `215/MT + Transportation cost of `310/MT + unloading charges of `50/MT). The base price and VAT are based on the quotation received from M/s. Star Coal (Supplier of Indonesian Coal) dated 24-03-2014.

On this the respondents stated that the price of coal is directly proportional to the gross calorific value. The GCV proposed by the petitioner is 4338 KCal/kg. The GoAP issued orders dated 13-03-2014 permitting all sugar mills having co-generation facility capable of running with coal, for power generation using coal as fuel during non-crushing season from the date of issue of orders till the start of next crushing season and supply to DISCOMs at the rate fixed by the APERC. The GoAP did not specify the kind of coal to be utilized. However, the petitioner has opted to utilize the higher price Indonesian coal for generation of power as per GO dated 13-03-2014. As such, the risk of the developer's option

for utilizing higher purchase price Indonesian coal shall not be passed on to APDISCOMs, which in turn will unduly burden the end consumers. Further, the coal price requested by the petitioner is based on the quotation from M/s. Star Coal India (P) Ltd., and the same cannot be relied upon since the quotation is not authenticated. Hence, the Commission is requested to peruse the original receipts/bills from the coal supplier throughout the period of generation using coal. In addition, the petitioner has claimed GCV of 4338 KCal/kg for the coal utilized for power generation at 4875/MT (inclusive of transportation and VAT). It is ascertained that the basic price/tonne with GCV ranging from 4301 to 4600 from the Singareni Collieries Company Ltd., is as follows:

GCV grade of coal	GCV Range (KCal/kg)	ROM Coal `/MT	Steam Coal `/MT	Slack Coal `/MT	Crushed ROM Coal `/MT
G 10	4301 to 4600	2100	2430	2130	2190

As seen from the above, the maximum price for the coal with GCV of 4338 Kcal/kg is `2430/MT, and adding 20% (say) towards other charges viz., transportation, VAT etc., the coal price comes to around `3000/MT. With this coal price and GCV, the variable cost comes to `2.73/unit. If the eligible fixed cost of `1.39/unit (the CoD of the plant is 12-03-2010 and the plant is in 5th year of operation) is added, the total comes to `4.12/unit. As per the quotation furnished by the petitioner, the GCV is 5000 Kcal/kg and with this the variable cost comes `3.50/unit and the total cost comes to `4.89/unit (`3.50+`1.39). Even otherwise APPCC is purchasing power from other developers generating power using imported Indonesian coal under short term basis at `5.45/unit. As such Commission may determine the purchase price with a variable cost of `2.73/unit and the total cost of `4.12/unit.

On this, the petitioner in the re-joinder submitted that the Government did not specify the type of coal in the GO. The petitioner proposed to generate energy by using less ash content coal suitable for its boiler during non-crushing season. Moreover, when the Government did not specify what kind of coal to be used and the respondents did not object for the same in the previous years, respondents are not justified in raising such contentions at this point of time that too after receiving the energy produced and supplied by petitioner as per

the PPA. Singareni coal contains more ash content (30 to 50%) where as Indonesian coal contains low ash which is less than 10%. The petitioner's boilers are suitable and are designed to use less ash content coal and if the high ash content coal is used, the same will get damaged. Further, Singareni coal is not available whenever it is required by the petitioner. Hence, if Singareni coal is to be used in the plant it has to be procured in advance in large quantity leading to higher working capital. The determination of tariff/cost of compensation is based on the coal that is actually utilized by the petitioner and not on the speculative basis. Imported coal is available at any time and can be brought through Krishnapatnam port, whenever it is required. Moreover, most of the Bagasse power projects use Indonesian coal but not Singareni coal. The distance from Singareni to the plant is too long and if the transport charges are added to the price of the coal along with taxes the landed value will be more than that of Indonesian coal. Coal price may be fixed basing up on the cost fixed by the Commission in the previous years by increasing 5%.

Commission has examined the rival contentions of the parties. After the power is generated by the plant and consumed by the DISCOMs, it is not proper on the part of respondents to say that the petitioner should have used Singareni coal rather than imported Indonesian coal, more so when the G.O. itself did not prohibit use of imported coal and the same was allowed to be used in the previous years, without any demur and further more when the said coal is stated to be suitable for the petitioners boilers having less ash content. Hence, the contention of the respondents does not hold water.

Having said thus, the issue before the Commission is to determine the cost of coal and the corresponding GCV for the purpose of working out the price to be paid to the petitioner herein. During the course of hearing, the learned counsel for the petitioner stated that the base price of the coal should be taken as `4,300/tonne in as much as the same was little higher over the last year's price allowed by the Commission, being `4,100/tonne and the other components constituting the final coal cost can be as adopted for the previous years. The learned counsel for the respondent did not seriously oppose this point of view. As such, the Commission considers it just and reasonable to allow a base price of `4,300/tonne + `215 (towards 5% VAT). Coming to the aspect of the transportation cost to be allowed, it has to be borne in mind that the place

from which coal now procured got changed from Chennai to Krishnapatnam and as such it is not proper to merely adopt the earlier transportation cost and therefore commission feels it just and reasonable to consider a transportation cost of `310 as requested by the petitioner. The total price thus works out to `4825.

As regards, the GCV to be allowed, there was no much discussion on this issue during the course of hearing. The petitioner suggested the figure of 4338/Kcal/kg, whereas the quotation containing the base price of coal of `4300/tonne, indicates a GCV (ADB) of 5500±100 Kcal/kg. Based on this the respondent in their reply suggested a value of 5000 Kcal/kg towards GCV. In view of the above, Commission is inclined to accept a GCV of 4900 Kcal/kg allowing usual tolerances in as much as it corresponds to GCV (ADB) of 5500 Kcal/kg indicated in the quotation wherein the base price of `4300/tonne is also indicated and finally allowed by the Commission.

(d) <u>Auxiliary consumption</u>

On this, the petitioner indicated a figure of 10.00% as Auxiliary consumption. On the other hand the respondent has stated that the usage of coal does not have any impact on Auxiliary Consumption (AC) as these plants are already designed and installed with equipment required for firing of coal. AC adopted by APERC is already higher than CERC norms. Also, the Commission in its earlier orders dated 06-08-2013, while determining the power purchase price in respect of power supplied by Bagasse based co-generation projects by using coal in O.P.No.41 of 2013, adopted AC of 9%. As such, the request of the petitioner for higher AC of 10% is not justified and it is requested to adopt the AC of 9% only.

In the rejoinder, the petitioner has stated that the calculations furnished by them are actuals but not mere paper workings.

The Commission has examined the matter. The usage of coal cannot have any impact on AC as these plants are already designed and installed with equipment required for firing of coal. The AC adopted by the Commission is already higher than CERC norms. Further, through the recent amendment dated 19-03-2015 in the PPA submitted to and approved by the Commission, the developer has tacitly agreed for the AC of 9% in as much as the present variable cost included in the amendment is worked out based on 9% only. As such, the Commission

hereby directs that an Auxiliary Consumption of 9% shall be adopted.

(e) <u>Transmission Line Maintenance Expenses:</u>

The petitioner herein requested that the Transmission Line Maintenance Expenses of 1 paise per unit is being claimed by them, which is not included in the O&M expenses, being part of fixed cost needs to be paid to them. APTRANSCO at present is deducting this amount, from the export bill. This cost is not included by APERC in the tariff.

[

The respondents did not take into account, these expenses proposed by the developer under the fixed cost, thus denying this as an element of fixed cost.

Commission has examined the matter. Article 3.1 & 3.3 of the Power Purchase Agreement to the extent required in addressing this issue are extracted as hereunder:

Article 3 (Interconnection facilities):

> *Article 3.1: Upon receipt of a ……APSPDCL shall evaluate, design, install, own, operate* ***and maintain the Interconnection Facilities*** *and perform all work,* ***at the Company's expense****, necessary to economically, reliably and safely connect the APSPDCL's existing system to the Project Switch Yard."*
>
> *Article 3.3: The maintenance expenses of the interconnection facilities from time to time* ***have to be borne by the Company****. The maintenance work on the Generating units has to be done in coordination with the APSPDCL.*

As can be seen from the above, the petitioner herein had agreed for bearing the maintenance expenses for the interconnection facilities from time to time in the PPA signed by them. As such, this cost cannot be allowed to be passed on to the respondents herein.

(f) <u>Payment of electricity duty:</u>

The petitioner herein requested that the payment of electricity duty @ 6 paise per unit may be permitted to be included in the bill. ATE vide order dated 20-12-2012 allowed electricity duty as pass through.

There was no specific response from the respondents on this issue.

However, the respondent did not take into account this parameter while working out the tariff.

Commission has examined the matter and decided to allow the electricity duty @ 6 paise per unit to be reimbursed by the respondent herein.

(g) <u>Interest on working Capital:</u>

On this, the petitioner submitted a statement on computation of additional interest on working capital claming an amount of `0.28/unit.

There was no specific response on this by the respondent. However, the respondent did not take into account this parameter while working out the tariff.

The commission has examined the matter. The request of the developer to allow interest on working capital on the additional cost while operating the plant with coal has some force. However, it is not necessary to delve on the issue of the amount to be paid on this account in greater detail since the petitioner in the rejoinder requested for allowing 7 paise / unit as allowed by the Commission in the previous years as against 28 paise claimed in the original petition. The respondent also did not oppose this proposal. Hence, Commission hereby allows 7 paise / unit to be paid towards interest on additional working capital.

6. Based on the above parameters, the variable cost to be paid using coal is to be worked out based on the following formula:

[(SHR/GCV)*(CF/1000)] / [1-(AC/100)]

Where

SHR	=	Station Heat Rate in kcal/kWh
GCV	=	Gross Calorific Value in kcal/kg
CF	=	Cost of Fuel in `/MT
AC	=	Auxiliary Consumption

With the above formula, the variable cost per unit using coal as fuel works out to `3.90/unit. However, an additional amount of 7 paise per unit may also be paid for the units to be generated and supplied by the petitioner herein towards interest on working capital on the additional cost of generation using coal.

7. In the light of the foregoing discussion, APDISCOMs are directed to compensate the adverse financial impact pursuant to section 11 directions of GoAP by making payments as detailed hereunder:

(a) `3.90/unit towards variable cost for the units generated using coal.

(b) An additional amount of 7 paise per unit for the units to be generated and supplied by the petitioner herein towards interest on working capital on the additional cost of generation using coal.

(c) For the units' generated upto the threshold PLF of 55%, paying fixed cost per unit relevant to the year of operation as in the subsisting PPA. The generation using coal during non-crushing season shall also be taken into account for computing the PLF.

(d) For the units generated beyond the threshold PLF of 55%, no fixed cost is payable. However, an incentive of 0.25 paise per unit is to be paid for the units generated beyond 55% PLF as in the subsisting PPA.

(e) The electricity duty at 6 paise / unit shall be reimbursed.

8. **I.A.No.10 of 2014:** In the said interlocutory application, the petitioner essentially prayed for fixing an interim price of `6/ unit pending finalization of the final price in the original petition. The respondents 1 to 3, in their reply, interalia, stated that since the petitioner is already being paid an adhoc tariff of `5.40/unit inclusive of fixed cost, the IA may be dismissed as the interlocutory application has become infructuous, the same has to be dismissed.

9. The main petition stands disposed of with the above directions and the interlocutory application dismissed. No costs.

This order is corrected and signed on this **23rd day of May, 2015.**

Sd/-	Sd/-	Sd/-
P.Rama Mohan	Dr.P.Raghu	Justice G.Bhavani Prasad
Member	Member	Chairman