

HARYANA ELECTRICITY REGULATORY COMMISSION

BAYS 33-36, SECTOR - 4, PANCHKULA - 134 112 HARYANA

Date of hearing: 07.04.2011

Date of order: 27/05/2011

IN THE MATTER OF

The Hon'ble APTEL judgment dated 1st March, 2011 in appeal No. 16 & 117 of 2010 filed by the biomass based renewable power generators and distribution licensees respectively against the Commission's order dated 6th November, 2009 determining the tariff for sale of electricity by biomass based energy developers to the distribution licensees in the State of Haryana.

Present

Shri Bhaskar Chatterjee, Chairman

Shri Rohtash Dahiya, Member

Shri Ram Pal, Member

ORDER

Brief Background:

The Commission had passed an order dated 15th May, 2007 determining tariff and related issues in respect of non conventional sources for energy including biomass against which the renewable energy power developer from biomass based power projects filed a review petition before the Commission. The review petition was disposed of vide order dated 3rd October, 2007 without giving any relief to the parties. Aggrieved by the order(s) of the

Commission, the renewable energy power developer from biomass based power projects and distribution licensees preferred appeal No. 113 of 2007 and 24 of 2008 respectively against Commission's order dated 15th May, 2007 and the review order dated 3/10/2007 before Hon'ble APTEL. The Hon'ble APTEL disposed of the appeal vide judgment dated 25th March, 2009 remanding the case to the Commission with the following directions:

“On going through the main order and the review order passed by the Commission we find that there are no reasons for the said finding given in the impugned order. Therefore, it would be appropriate to remand the matter back to the commission to hear the parties again on these issues and decide the same on the reasons to be recorded in the order. It is made clear that we are not expressing any opinion on these issues. According the impugned order dated 15th May, 2007 is set aside and the same is remanded to the Commission for deciding these two issues after giving the opportunity to the both the parties s indicated above.”

The Commission after hearing the parties on 30th April, 2008 passed order dated 6th November, 2009 in which the only relief granted by the Commission was that the annual tariff escalation factor, in the case of biomass based generation project, was enhanced from 2% to 3%.

The biomass based project developers and Uttar Haryana Bijli Vitran Nigam Limited (UHBVNL) aggrieved by the orders of the Commission dated 6/11/2009 filed appeal No 10 of 2010 and 117 of 2010 respectively before the Hon'ble APTEL. The Hon'ble APTEL after hearing the parties delivered judgment dated 1st March, 2011.

The operational part of the judgment on various issues is reproduced below:

1. Cost of Biomass fuel: “...we direct the State Commission to re-determine the price of biomass fuel after detailed analysis and considering the

regulations of the Central Commission and give a reasoned order in this regard.”

2. Return on equity: “the State Commission has erred in working out the pre-tax ROE for Biomass power projects on account of following:

a) Pre-tax ROE calculated on 14% post ROE with tax as pass through will work out to be more than 16% with MAT @ 15%. Conversely 16% pre-tax ROE without income tax as pass through will result in post tax ROE of less than 14% with MAT @ 15%. This would place biomass projects in disadvantageous position compared to conventional fuel based projects.

b) From 11th Year onwards normal income tax rates will be applicable so pre-tax ROE will have to be enhanced.

We therefore, direct the State Commission to re-determine the ROE accordingly”.

3. Capital Cost: “.....the State Commission to re-determine the capital cost considering the Central Commission’s Regulations and capital cost data of comparable projects from the bio-mass projects in other states”.

4. Operation and Maintenance expenses and Depreciation: “..... the State Commission to determine the O&M and depreciation keeping in view the Central Commission’s Regulations”.

5. Rate of interest for term loan and working capital: “....the State Commission to determine the interest rate keeping in view of the Central Commission’s Regulations”.

6. Prohibition of sale of power to third party: “.....The State Commission is directed to pass an order to allow third party sale as per scheme and provisions of the Act”.

Commission's Analysis & Order:

In the light of the above order of the Hon'ble APTEL and after providing an opportunity of hearing to the parties, the Commission has revisited its order determining tariff for the biomass based projects to be set up in Haryana.

The Commission has evaluated the tariff design options available to it i.e. front loaded tariff, back loaded tariff and cost plus approach. Given the limited energy available in Haryana from renewable sources and obligations imposed upon the distribution licensees to meet the RPO or in its absence take recourse to REC mechanism and also considering the fact that the order of Hon'ble APTEL allowed third party sale, the Commission is of the considered view that front loading of tariff may induce the developers to switch over to third party sale or opt for REC after taking benefits of front loaded tariff. On the converse back loaded tariff may pose problems for the project developers in meeting with their loan payment liabilities as the normative loan component is 70% of the cost of capital. **Consequently, the Commission considers it appropriate to retain cost plus approach as adopted by it in the case of renewable energy projects as this would balance the interest of all stakeholders.**

The tariff in the cost plus approach depends on the assumptions on Capital Expenditure, Cost of Investments, Financing Cost and the Operating Parameters including Station Heat Rate, cost and GCV of fuel (biomass mix) likely to be used etc.

The key parameters considered for working out the tariff is as under:-

1. Capital Cost
2. Debt – Equity Ratio
3. Plant Load Factor
4. Auxiliary Power Consumption
5. Operating & Maintenance Cost
6. Depreciation
7. Interest on terms loan & working capital loan

8. Cost of fuel / Heat Rate / GCV of biomass mix
9. Return on Equity.

All the above parameters are discussed in details in the paragraphs that follows:

Capital Cost

The views of various stakeholders on the issue are presented below:-

i) **Sri Jyoti Renewable Energy Private Ltd.** Who reportedly are in an advance stage of commission their 9.5 MW biomass based generation project in Bhiwani , Haryana has submitted that as per the actual expenditure incurred or are committed through legal agreements the cost per MW including Interest During Construction (IDC) is Rs. 5.08 Crore and without IDC the same is Rs. 4.80 Crore / MW.

ii) **Star Wire (India) Biomass Private Limited** has submitted that the cost of project per MW for their proposed 8 MW project is Rs. 5.92 Crore. Additionally, they have submitted that considering the Indexation allowed by the central Commission linked to WPI of Steel and Cement which is averaging around 10%, the neighbouring states around Haryana have considered Rs. 5 Crore / MW as project cost.

In line with the judgment of hon'ble APTEL the Commission has examined the project cost as allowed by the CERC and cost of biomass project data allowed to the project developers in a few other states. The Commission notes that the Central Commission, for biomass project, has considered capital cost of Rs. 4.50 Crore / MW in FY 2009-10 linked to indexation formula. Thus given about 5% average per annum rise in price level the project cost in FY 2011-12 works out to Rs. 4.96 Crore / MW. The Commission has also examined the project cost allowed by the SERCs in different states and observes that there is a wide variance in the same. The project costs considered in a few other states are tabulated below:-

State	Rs Crore /MW
CERC	4.50 (2009-10 linked to indexation formula)
Bihar	4.25
Chhattisgarh	4.00
Jharkhand	5.50
Karnataka	4.87
Rajasthan	4.72 (Water Cooled) 5.85 (Air Cooled)
Tamil Nadu	4.50 (1 st Year)
Madhya Pradesh	4.25
Uttar Pradesh	4.25

In addition to the above project cost of biomass based generation projects recently financed by IREDA was also examined. As per IREDA the project cost considered by them is Rs. 4.9 Crore / MW (Air cooled) and 4.5 Crore / MW (Water Cooled).

Thus given the wide variations in project cost the Commission consider it appropriate to peg the project cost for estimating generation tariff at Rs. 4.5 Crore / MW in line with the HERC regulations.

Debt – Equity Ratio

The capital structure considered by the Commission in its previous order(s) for all renewable fuel based generation projects has been 70% debt to be funded by way of long term loan and 30% of the project cost to be brought in as initial equity by the project developers. As neither the stakeholders nor the judgment of the hon'ble APTEL has raised any issue against it or suggested anything to the contrary, **the Commission, in line with its regulations and the national benchmarks including CERC regulations retains the normative capital structure at 70:30 which is also in line with the norms adopted by the financial institutions for approving project loans.**

Plant Load Factor (PLF)

PLF in the case of biomass based generation project is largely influenced by the availability of fuel i.e. biomass mix. Given the abundance of biomass in Haryana which is sufficient to sustain a large number of biomass based generation projects, **the Commission, in line with the CERC / HERC regulations considers it appropriate to consider PLF of 70% in the first year of operation and 80% for the remaining life of the project.**

Auxiliary Power Consumption

Inherent technology, various operational efficiencies including that of auxiliary motors, O&M practices and energy conservation measures adopted by the generator largely determines the level of auxiliary power consumption. The Commission observes that as far as this parameter is concerned there is no divergence in the recommendations of CEA, CERC as well as HERC regulations for biomass based energy generation projects.

Consequently, the Commission has considered auxiliary power consumption for biomass based generation projects as 10%.

Operating & Maintenance Cost (O&M)

On the issue of O&M the Commission observes that there is wide variance in the approach adopted by different SERCs as well as CERC. The Central Commission has considered Rs. 20.25 lakh / MW translating into 4.5% of the project cost as O&M expenses along with 5.72% annual escalation. As against this Chhattisgarh has considered 7% for the first three years along with an annual escalation of 5%, Gujarat has considered 7% along with 5% escalation, Karnataka has considered 4% with 5% annual escalation, Madhya Pradesh & Maharashtra has considered 4% with 5% annual escalation, Rajasthan has considered 6.5% for the plant and 3% for the transmission lines with 5% annual escalation, Tamil Nadu has considered 4.5% with 5% annual escalation and Uttar Pradesh has considered 4% with 5.72% annual escalation in O&M expenses. While the Central Electricity Authority has recommended O&M expenses including insurance as 7% of the Capital Cost.

In view of the above divergence on the issue of O&M expenses, the Commission considers appropriate to adopt O&M norm as approved by the CERC. Consequently, for the purpose of estimating biomass based generation tariff the Commission has considered Rs. 20.25 lakh / MW i.e. 4.5% of the capital cost as O&M expenses along with 5.72% annual escalation as approved by CERC.

Depreciation

The issue of depreciation has been examined afresh. The Commission observes that as per standard practice in the case of renewable fuel based generation projects as also adopted by CERC i.e. Straight Line Method (SLM),

70% project cost is to be depreciated in the first 10 years. The depreciation of balance 20% is to be spread over the remaining life of the project and the remaining 10% being the residual value. The Commission notes that most of the SERCs have followed this methodology with the exception of Maharashtra and Tamil Nadu. **Consequently, in line with the widely followed practice as explained above the Commission has considered 7% depreciation for the first ten years and 2% from eleventh to twentieth year for the purpose estimating tariff.**

Interest on terms loan & working capital loan

The hon'ble APTEL in its judgment has directed the State Commission to determine the interest rate keeping in view of the Central Commission's Regulations. The CERC regulations provides that interest on Working Capital shall be the average SBI Short Term Prime Lending Rate plus 100 basis point i.e. 1%. The Commissions observes that in the last one year or so SBI has quite frequently revised its lending rates upwards. The SBI prime lending rate in May, 2011 after 75 basis points revision is 14%. **The average rate works out to around 13.5%. Hence, the Commission after factoring in 100 basis points as per CERC norm has considered interest rate of 14.5% on the working capital.** The interest rate allowed by different SECRCs range from 10.75% Karnataka, 12% Tamil Nadu, 12.75% Chhattisgarh, 13.25% Karnataka to 13.75% Madhya Pradesh based on past benchmark rates. The computation of working capital is as per the CERC / HERC norms.

As far as interest on project loan is considered the interest rate considered by different SERCs ranges from 11% (Gujarat) to 12.80% (Uttar Pradesh). The CERC norms provide for average SBI Long Term Prime Lending Rate plus 150 basis points i.e. 1.5%. The Commission notes that the average rate of interest on project loan is around 9.5%, hence adjusting the same as per CERC norm i.e. 1.5%, the rate works out to 11%. **Thus the Commission, for**

the purpose of estimating interest cost on normative loan equivalent to 70% of the project cost, has considered a rate of interest of 11%.

Cost of fuel / Station Heat Rate / GCV of biomass mix

The hon'ble APTEL in their judgment while remanding the matter back to the Commission directed to re-determine the price of biomass fuel after detailed analysis and considering the regulations of the Central Commission and give a reasoned order in this regard.

In light of the above the Commission in the hearing held on 7/04/2011 sought the views of the project developers as well as the nodal agency HAREDA on the cost of biomass mix in Haryana. The representative of Star Wire (India) Biomass Private Limited submitted that as per CERC regulations fuel cost is Rs. 2168 / MT for FY 2009-10 with escalation. In the ongoing procurement season the fuel cost is around Rs. 3000 / MT. The fuel cost according to them in Narnaul (Mahendragarh) was between Rs. 2500 – 3000 / MT in FY 2010-11.

Sri Jyoti Renewable Energy Private Limited submitted that they are currently procuring mustard fuel at an average rate of Rs. 2550 / MT. As time progresses i.e. by October, the prices reach about Rs. 2800 / MT. Hence they have requested the Commission to consider fuel price of Rs. 2725 / MT along with 10% annual escalation in fuel price so that their project can become financially viable.

Haryana Renewable Energy Development Agency (HAREDA) vide their letter HAREDA / 2011 / 269 dated 18/04/2011 has informed the Commission that the present average fuel cost in Haryana works out to Rs. 2333 / MT.

The Commission observes that the cost of fuel (biomass) quoted by different stakeholders vary widely i.e from Rs. 2333 / MT to Rs. 3000 / MT. As the collection and transportation of biomass is largely in the un – organised sector hence local factor influences the cost thereby determining generic cost of fuel a difficult one. Additionally, the exercise becomes complex as the cost of fuel also depends upon the nature of fuel, its availability in different cropping season, location of the plant as well as biomass mix used at different points of time. Consequently, in the absence of any past trend of fuel prices the Commission consider appropriate to adopt the fuel prices as per CERC regulations as they also take into consideration the fact that most of the projects would be based on a variety of biomass mix each with different characteristic and calorific values in varying proportion. **Hence, in line with CERC norms, the Commission allows an average cost of fuel of Rs. 2390 / MT in FY 2011-12 along with escalation of 5% per annum on compounded basis for future years which has also been considered by the hon'ble APTEL in the case of Chhattisgarh.**

In addition to the above, fuel consumption has also to be determined which is largely influenced by station heat rate for biomass based generating units as well as the gross calorific value (GCV) of fuel. As biomass based project developers in Haryana would largely be using rice husk, cotton stalk, mustard husk, woody biomass etc. with widely varying calorific value, the **Commission, for the purpose of estimating fuel consumption decides to adopt GCV as per CERC / HERC norms i.e. 3458 Kcal / Kg** which is based on weighted average GCV of biomass mix likely to be used in Haryana.

Another important constituent of determination of fuel consumption and cost thereto is the Station Heat Rate (SHR). The SHR is primarily dependent upon capacity, configuration and design of the plant, technology (boiler type, pressure levels etc.), O&M practices and quality of fuel used and loading of the machines. The Commission notes that the above mentioned technical

parameters except operational performance under varying load and the nature of condenser i.e Water Cooled or Air Cooled would be more or less similar in Rankin cycle based generation projects. However, different SERCs have adopted varying SHRs for generation tariff determination for biomass based projects. The SHR varies from 3600 – 3650 Kcal / kWh (Maharashtra & Madhya Pradesh) to 4500 Kcal / kWh (Karnataka). The Central Electricity Authority has recommended SHR of 4500 Kcal / kWh. **In view of the widely varying SHRs as discussed above the Commission considers it appropriate to adopt SHR of 3800 Kcal / kWh in line with CERC / HERC regulations which is more technology specific.**

Return on Equity

The CERC as well as HERC regulations allow pre – tax 14% ROE for the conventional fuel based generation plants while giving them the flexibility to manage their tax liability within the allowed return. However, most of the SERCs namely Chhattisgarh, Jharkhand, Karnataka, Tamil Nadu, Maharashtra, Rajasthan, Uttar Pradesh etc. have allowed a higher ROE to renewable fuel based generating plants in order to encourage investments in renewable sources of energy. **Thus the Commission, in view of the observations of hon'ble APTEL that the biomass project developers should not be in a disadvantageous position allows Pre – tax ROE of 19% for 1 -10 years and 24% from 11th year onwards as per CERC / HERC regulations.**

Tariff Rate

In view of the financial and technical parameters discussed above, the Commission in compliance with the order of the Hon'ble APTEL, re - determines the tariff for biomass based generation projects as under:-

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Tariff (Rs/kWh)	5.26	5.04	5.18	5.32	5.47

The tariff determined by the Commission includes tax liabilities as well as fuel and O&M escalation, hence no separate tariff escalation has been provided. It shall be valid for a period of five years beginning FY 2011-12. The Commission may review fuel cost after a period of three years, if necessary. For the project that are commissioned after FY 2011-12 the tariff shall be arrived at after factoring in the project cost indexation mechanism approved by the Central Commission.

Grid Connectivity:

The state transmission utility / distribution licensee will bear the cost of EHV/HV transmission line up to a distance of 10 km from the point of energy metering. Beyond the 10 km distance, the balance cost of the transmission line shall be shared equally between the developer and the STU / distribution licensee.

CDM

The sharing of CDM benefits shall be as per HERC Regulations as amended from time to time.

The petition filed by biomass based power project developers for execution of Hon'ble APTEL's judgment dated 1st March, 2011 is disposed of accordingly.

This order is signed, dated and issued by the Haryana Electricity Regulatory Commission on 27th May, 2011.

Date: 27/05/2011

Place: Panchkula.

(Ram Pal)

Member

(Rohtash Dahiya)

Member

(Bhaskar Chatterjee)

Chairman