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Att: CDM Executive Board

Your ref.:
CDM Ref 1175

Our ref.:
MLEH/KCHA

Date:
18 September 2007

Response to request for review

9.8 MW Renewable Energy Generation for the grid at South Asian Agro Industries Limited in Raipur District, Chattisgarh (1175)

Dear Members of the CDM Executive Board,

We refer to the issues raised in the requests for review raised by three Board members concerning DNV's request for registration of project activity 1175 "9.8 MW Renewable Energy Generation for the grid at South Asian Agro Industries Limited in Raipur District, Chattisgarh" and would like to provide the following clarifications.

Comment 1:

Further evidence is required to support the benchmark calculation.

DNV Response:

The selection of the Weighted Average Cost of Capital (WACC) as a benchmark for the proposed project activity and the calculation of the WACC are in our opinion justified and acceptable. The financial analysis for the project, including the WACC calculations, was submitted as annex to the PDD when the project was submitted for registration.

Our opinion is and was based on the following:

- The total finances obtained for the project include two components, i.e. loan and equity. Subsequently, the project IRR is based on the total investment (including the debt and the equity portions). In order to evaluate the financial viability of the project, the project developer is required to assess the expected minimum returns on all components of the investment made. Hence, the benchmark selected needs to be such that, the expected minimum returns takes into consideration the risks associated with each of the components of the total investment. Thus, from investor's perspective, the WACC is in our opinion the appropriate benchmarks for comparing project IRR since it is the weighted average of the total cost of the different components of the investment.
- DNV was able to confirm the correctness of the WACC based on the following evidences that were reviewed:
 - The interest rate of 12% on the debt portion of the investment and 11.5% on the working capital, considered for the WACC calculation was verified against the detailed project report (DPR). A copy of the section that states the interest rates in the DPR has been attached as Annex I to this email.

- The post tax returns of 16% on the equity portion expected for project was confirmed against the DPR as well as that of the returns as allowed by the Chhattisgarh Electricity Regulatory Commission for biomass based power projects. Attached is Annex II: Extract of the CERC tariff order for biomass based power plants, page 15.
- Additionally, as per the Companies (Transfer of Profits to Reserves) Rules, 1975 for India, in cases where the dividend proposed is between 15% and 20%, (as is in the project case of 16%) the project proponent is required transfer to the reserves, not less than 7.5%^{*} of the current profits (please see link below). Furthermore, the Income Tax Act, 1961 requires the project proponent to remit dividend distribution tax at the rate of 13.0685%[†] before declaring the return on equity. Attached is Annex III: Extracts from Direct Taxes Ready Reckoner –Taxmann’s 2004-05 for the source of dividend distribution tax (DDT) considered.

Considering the above mentioned taxes and returns, the total return on the equity post tax works out to be 19.90%. The weighted average of the return on equity (19.90%) and the return on debt (12%) and working capital (11.50%) is estimated to be 14.47% as illustrated in the calculation sheet already provided as an annex to the PDD when the project was submitted for registration. The same has been provided again as Attachment I: Financial Calculation sheet, to this response.

Comment 2:

Further evidence is required regarding how the DOE has validated the input values, such as biomass price and interest payments, used in the calculation of the project IRR.

DNV Response:

- **Biomass Prices:** DNV was able to confirm the biomass prices, as used in the IRR calculations against the DPR for the project and the quotations signed by the biomass suppliers for the project. The biomass prices during the initial stages were INR 650 per metric tonne, which was verified against the detailed project report. However, the prices showed an increasing trend with the approach of implementation stage of the project and the same was confirmed against the quotations provided, which are in the price range of INR 850 to INR 1100. Taking a conservative approach, the project proponent has used the lower values amongst the prices as provided by the suppliers in the quotations. This is further in line with the prices of INR 850 to INR 900 per metric tonne, as submitted in the DPRs by various biomass based power generators to Chhattisgarh Electricity Regulatory Commission (CERC). A copy of the quotations is provided as Annex IV, biomass prices as stated in the DPR as Annex V and the extracts of the CERC tariff order for biomass price, page 18 and 19 as Annex VI respectively have been provided.
- **Interest Payments:** The interest payments calculations as stated in the IRR calculation sheets were confirmed by DNV against the interest rates in the DPR for the project. It has been verified that the interest rates on term loan and working capital are 12% and 11.5% respectively. The interest subsidy of 2% available for up to INR 20 million on the term loans has been deducted from the total annual interest payments. The revised IRR calculation sheets, to include a new spreadsheet: “workings”, to show the detailed interest calculations annually has been provided as Attachment I: Financial Calculation sheet, to this email.

^{*} Clause 2 (percentage of profits to be transferred to reserves), sub clause (iii), Companies (Transfer of Profits to Reserves) Rules, 1975, Ministry of Corporate Affairs, Govt. of India. <http://www.mca.gov.in/MinistryWebsite/dca/actsbills/rules/CToPtRR1975.pdf>

[†] Income Tax Act, 1961

Comment 3:

Further evidence regarding the current practice of construction of biomass plants in the region is required to substantiate the prevailing practice barrier, as the PDD indicates that biomass prices have risen in response to demand.

DNV Response:

As stated in the PDD and the validation report submitted, DNV is of the opinion that the price for biomass in the state of Chhattisgarh have risen owing to commercial reasons like the unstable and unregulated biomass prices. DNV was able to confirm that the biomass prices in the region have seen a variation from INR 650 during the DPR stage to INR 1100 as per the biomass price in the quotations provided by the suppliers. A copy of the quotations (Annex IV), biomass prices as stated in the DPR (Annex V) and the extracts of the CERC tariff order (Annex VI) are provided.

In comparison to the baseline case, where the Coal India Limited (CIL) regulates and fixes coal prices in India, the price for biomass are not regulated by any organisation or agency and is on the contrary, driven by market forces. Owing to the commercial opportunity created by the establishment of biomass based power generation, an increasing trend in the biomass prices have been noticed.

Additionally, the increase in the biomass prices, is further attributed by the increased cost of collection and transportation of the biomass. Cost of diesel used in trucks, which are the main means of biomass transportation, has seen an increase by about 80% between 2002 and 2007*.

The prevailing practice, however, for the region remains thermal based power generation, as confirmed against the annual reports published by the Ministry of Non-conventional Energy sources (MNES), which show that the installed capacity (MW) of the biomass projects (11MW) as compared to that of thermal based power generation (1615MW) was a meagre 0.68% in 2002-2003†. By the year 2005-2006, the same is seen to show an improvement to about 2178MW installed capacity for thermal based power generation as opposed to the 88.5MW for biomass based power generation, which amounts to 4.06% of the total installed capacity, as stated in the MNES annual report for 2006-07‡).

Hence, DNV is of the opinion that the prevailing practice in the region is clearly, thermal based power generation, while power generation utilising the renewable biomass sources faces additional risks due to the unstable biomass prices, as discussed above.

Comment 4:

Further corrections in the calculation of project emission, as stated in page 28, column 7, as the unit of the NCV of coal should be kcal/kg instead of kcal/kWh. This correction has to be made also in the corresponding excel file annex B.

DNV Response:

The PDD and the annex B (CER calculation sheet submitted during request for registration) have been corrected to reflect the above mentioned comment.

The revised PDD and the emission reduction calculation sheets have been provided as Attachment II and Attachment III, respectively.

* The historical price of diesel from Indian oil web site is considered for estimation. The Kolkata city diesel prices are considered appropriate, which is the nearest city to Chattisgarh among the other listed cities in the table. Web link: http://www.iocl.com/Diesel_prices.aspx

† Table no. 5.11, Annual Report 200-03 http://mnes.nic.in/annualreport/2002_2003_English/ch5_pg11.htm

‡ Statistics as on 31.12.2006, Table 3.2, the grid interactive biomass power - including co-generation http://www.mnes.nic.in/annualreport/2006_2007_English/HTML/ch3_pg5.htm

Comment 5:

Regarding project emissions, the fuel consumptions evaluation are based on an assumed 86,930 total consumption of mixed fuel at full capacity load (see excel file annex B). This has to be justified and correctly documented by stating the source, the rated fuel mix, the NCV of the fuels, the assumed power plant efficiency, etc.

DNV Response:

The project proponent has estimated project emissions based on the assumption that 10% of the total fuel consumption is accounted to the co-firing of coal during start-ups and emergency situations. The total fuel requirement for the project at full capacity load is worked out based on the station heat rates, fuel mix and the calorific values. The detailed fuel requirement estimations have been included in the emission reduction calculation sheets under the spreadsheet “fuel requirement” and have been provided as an attachment in Attachment III- CER calculation sheet.

The assumptions and the sources for the ex-ante estimation of fuel requirement have been as stated below. However, the actual emission reductions and the project emission calculations are calculated ex-post based on the actual fuel consumptions.

Parameter	Value	Unit	Source
Station Heat Rate (SHR)	3700	kcal/kWh	CERC Tariff Order - clause 14, sub clause (13), page no. 19 – Annex IV
Fuel consumption			
Rice Husk	90	%	PDD
Coal	10	%	PDD
Gross Calorific Value (GCV)			
Rice Husk	3200	kcal/kg	CERC Tariff Order - clause 14, sub clause (13), page no. 19 – Annex IV
Coal	4200	kcal/kg	The gross calorific value of coal is based on the information published by the Ministry of coal*.
Weighted average GCV	3300	kcal/kg	
Specific Fuel consumption	1.12	kg/kWh	Calculated value based on SHR and GCV for the fuels used.
Gross Electricity generation	77616	MWh/y	Estimated assuming a maximum of 330 days of operation as stated in the DPR.
Total fuel consumption	86930	tonnes	

* Gross calorific value of 'E' grade coal is considered; <http://www.coal.nic.in/point4.html>

Comment 6:

The statement that “However, the study concluded that no negative impacts are possible from the proposed project activity. Satisfied with the study and Environmental Management Plan (EMP) proposed to implement during construction and operation Govt. of India has issued its consent for implementation of project activity” is not correct and has to be deleted. The EIA identified some adverse impacts on the environment.

DNV Response:

The PDD has been revised to address the above mentioned comment. Please find attached the revised PDD as Attachment II.

We sincerely hope that the Board accepts our aforementioned explanations.

Yours faithfully

for DET NORSKE VERITAS CERTIFICATION AS



Michael Lehmann
Technical Director
International Climate Change Services



C Kumaraswamy
Manager – South Asia
Climate Change Services

Annexes:

- Annex I: A copy of the section of the DPR that states the interest rates.
- Annex II: Extract of the CERC tariff order for return on equity for biomass based power plants, page 17.
- Annex III: Extracts from Direct Taxes Ready Reckoner –Taxmann’s 2004-05 for the source of dividend distribution tax (DDT) considered.
- Annex IV: A copy of the quotations signed by the suppliers
- Annex V: A copy of the section of the DPR that states the biomass prices and
- Annex VI: Extracts of the CERC tariff order for biomass price, station heat rates and gross calorific values, page 18 and 19.

Attachments:

- Attachment I: Financial Calculation sheets.
- Attachment II: Revised PDD.
- Attachment III: Revised emission reduction calculation sheets.

Annex I: A copy of the section of the DPR that states the interest rates.

CHAPTER - 16
FINANCIAL ANALYSIS

16.1 General

The financial analysis gives the details of the operation and profitability, the cost of generation of power and cash flow after commissioning of the project. The analysis also gives the internal rate of return for the project, debt service coverage ratio and the rate of return of the quality.

16.2 Mode of Financing

The total project cost without the interest during construction and working capital margin is estimated to be Rs.3920.50 lakhs.

Since the project fulfils all the norms set by the Ministry of Non-Conventional Energy Sources of the Government of India, it is expected that the project will get the eligible interest subsidy. However, the financial analysis is done without considering the subsidy.

The project financing is considered to be with an debt to equity ratio of 70:30. The equity from the promoters is taken to be Rs. 1170.50 Lakhs.

Based on the above pattern of investment the interest during construction is calculated to be Rs. 223.00 Lakhs. This IDC as well as the provision for working capital margin of Rs. 100.00 Lakhs will be taken as long term loans and capitalized.

The total long term loans including the IDC and the working capital margin works out to Rs. 2750.00 Lakhs. It is assumed that this loan amount will be repaid in Six (6) years in 24 equal quarterly installments and there will be an initial moratorium of three (3) years on the loan repayment (18 months during construction period and 18 months after commissioning). An interest rate of 12.00% is considered on the term loans and working capital @ 11.50 %, and it is assumed that the interest payment and the loan repayment will be quarterly.

Annex II: Extract of the CERC tariff order for return on equity for biomass based power plant.

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(10) Return on Equity

The petitioner has pleaded for 16 % return on equity. Other State Commissions, such as KERC, MERC and APERC have considered 16% return on equity for the purpose of determining the cost of generation.

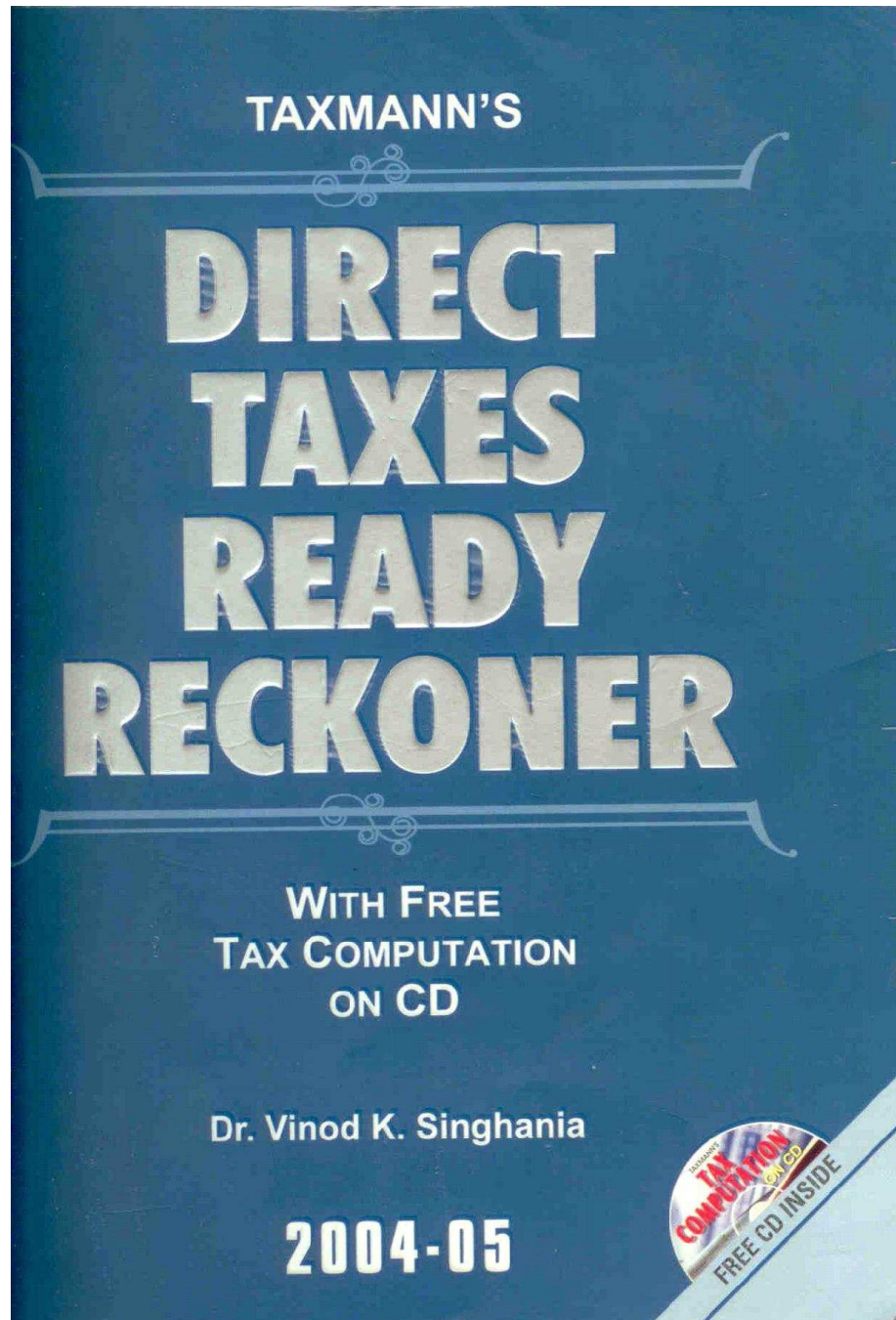
The Central Electricity Regulatory Commission has recommended ROE for generation at 14% and to meet the minimum alternate tax at the rate of 7.5% of above ROE, i.e. 1% may be increased and with this it comes to 15%. Considering the overall benefits from such projects and in order to promote their development, a ROE of 16% p.a. on equity capital is considered appropriate by the Commission for the purpose of determination of the tariff.

(11) Depreciation

The rate of depreciation proposed by the petitioner is 7.84 %. The CSEB has suggested that the depreciation schedule proposed by Ministry of Power should be followed for computation of tariff. The APERC has considered 7.84% as appropriate rate of depreciation, KERC has recommended 7% while MERC has approved 5.28% per annum on straight-line method.

In most of the DPRs, the rate of depreciation on buildings, has been taken at 3.34% and on plant and machinery and other misc. fixed assets at 5.28% on straight line method (SLM). The total amount of depreciation in this manner, in any case shall be less than the annual amount of repayment of loan capital considering a 10 years repayment schedule. In the DPRs the repayment schedule of loan capital has been taken as 10 years with a initial moratorium period varying between 1 and 3 years. A sanction letter of Allahabad Bank in case of NRI Power and Steel Pvt. Ltd. has been submitted by the petitioner in which repayment schedule of loan capital has been fixed for 10 years with a initial moratorium of 1 year. The annual loan capital repayment obligation shall thus be $1/10^{\text{th}}$ of the loan capital. To meet the annual repayment obligation, the Advance Against Depreciation (AAD) is also needed to be allowed along

Annex III: Extracts from *Direct Taxes Ready Reckoner –Taxmann’s 2004-05* for the source of dividend distribution tax (DDT) considered.



3. Tax is not deductible under section 193, 194, 194A, or 194EE if the recipient makes a declaration in Form No. 15G/15H under the provisions of section 197A [see para 175.4].

4. Under section 197 the recipient can apply the Assessing Officer in Form No. 13 to get a certificate of lower/no tax deduction. This benefit is, however, not available if tax is deductible under section 194B, 194BB, 194E, 194EE, 194F, 196B, 196C or 196D [see para 175.5].

Rates for tax collection at source

0.7 During the financial year 2004-05, tax shall be collected under section 206C at the following rates—

Nature of goods/nature of contract or licence or lease	If the purchaser or licensee or lessee is an individual, HUF, AOP or BOI and the aggregate amount subject to tax collection does not exceed Rs. 8,50,000				If the purchaser or licensee or lessee is (a) an individual, HUF, AOP or BOI and the aggregate amount subject to tax collection exceeds Rs. 8,50,000 or (b) an artificial juridical person				If the purchaser or licensee or lessee is a company, firm, co-operative society, or local authority			
	IT	SC	EC	Total	IT	SC	EC	Total	IT	SC	EC	Total
Alcoholic liquor for human consumption	1	Nil	0.02	1.02	1	0.1	0.022	1.122	1	0.025	0.0205	1.0455
Tendu leaves	5	Nil	0.1	5.1	5	0.5	0.11	5.61	5	0.125	0.1025	5.2275
Timber obtained under a forest lease	2.5	Nil	0.05	2.55	2.5	0.25	0.055	2.805	2.5	0.0625	0.05125	2.61375
Timber obtained by any mode other than under a forest lease	2.5	Nil	0.05	2.55	2.5	0.25	0.055	2.805	2.5	0.0625	0.05125	2.61375
Any other forest produce (not being timber or tendu leaves)	2.5	Nil	0.05	2.55	2.5	0.25	0.055	2.805	2.5	0.0625	0.05125	2.61375
Scrap	1	Nil	0.02	1.02	1	0.1	0.022	1.122	1	0.025	0.0205	1.0455
Parking lot, toll plaza, mining and quarrying (applicable from October 1, 2004)	2	Nil	0.04	2.04	2	0.2	0.044	2.244	2	0.05	0.041	2.091

Dividend tax under section 115-O

0.8 During the financial year 2004-05, dividend tax shall be charged as follows :

	Dividend tax	SC	EC	Total
Dividend* [other than deemed dividend under section 2(22)(e)]	12.5	0.3125	0.25625	13.06875
Deemed dividend under section 2(22)(e)**	NA	NA	NA	NA

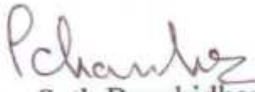
*Not taxable in the hands of shareholders [sec. 10(34)].

**Taxable in the hands of shareholders under section 56, without claiming any deduction under section 80L or 80M. The payer of such deemed dividend is liable to deduct tax at source under section 194.

Tax on income distributed by UTI/Mutual Fund under section 115R

0.9 Tax on income distributed by UTI/Mutual fund¹ shall be charged during the financial year 2004-05 as follows—

Annex IV: A copy of the quotations signed by the suppliers

SETH BANSHIDHAR KEDIA RICE MILLS PVT. LTD.	
Quotation	
To	09-03-2004
South Asian Agro-Ind. Ltd. Village – Khajuri (B.Bazar),	
Paddy Husk @ Rs.850 M.T.	
Dealing against 100% advance payment	
 For, Seth Banshidhar Kedia Rice Mills Pvt. Ltd.	
Lawan Road, Biloda Bazar 493 332, Chhattisgarh Tel.: 91 7727 222001/2/3, Fax: 222005, Email: kedia@banshidhar.com	

T No. 10/08/2372/15
C.S.T. No. 10/08/2100/C
TIN - 22561503174

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पत्र २५

दिनांक 1.2.07.....

QUATATION

HUSK PER MT \rightarrow 1100/- EX MILL POINT.

SUPPLY 48MT PER DAY

TERM CONS 100% ADVANCE PAYMENT

Original

SETH BANSHIDHAR KEDIA RICE MILLS PVT. LTD.

Quotation

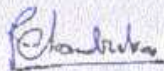
20/02/2007

To,

South Asian Agri Ind. Ltd
Villago-Khajuri (B. Bazar)

Paddy Husk @ 1100 Per M.T. Ex Mills

Dealing against 100% advance payment



For, Seth Banshidhar Kedia Rice Mills Pvt. Ltd.

गोपाल राईस मिल

लथन रोड, बलीदाबाजार 483 332 जिला- रायपुर (छ.ग.)

फोन : 07727- 222082, 222083, 230087, मो. 202392, 94255-08994

पत्र क्रमांक

Quotation :

दिनांक 17/02/97

To

The South Asian Agro Industries Ltd.
Villan Mahuri
Panchayat - Chabadih

Paddy Husk @ 1000.00 per M.T. for mill.

NOTE : - Delivery against full advance payment

Thanking you

Yours Truly,



पंचवटी राइस मिल

- लिमाही, बलौदाबाजार, जिला-रायपुर (36 मइ)-

फोन : 07727 230149, 222466, 223327, 98260 06644, 98269 07744

पत्र क्र.

दिनांक 2.2.07

QUATATION

SOUTH ASIAN AGRO INDUSTRIES LTD

HUSK — 1100/- per MT (MARKUT)
EX MILL POINT.

SUPPLY — 38 MT PER DAY

TERM 100% ADVANCE PAYMENT.

Pijay

Annex V: A copy of the section of the DPR that states the biomass prices

			Detailed Project Report
<u>ASSUMPTIONS</u>			
Capacity of the Plant	9800 KW		
Location of the Plant	Khajuri Village, Baloda Bazar Tehsil, Raipur Dt, Chhatisgarh State		
Wheeling Charges	3%		
Sale Price	3.00 Rs./kwh	1st Year	
Debt equity ratio	70:30:00		
Working Capital Margin	25%		
Number of days of operation	330		
Project Schedule	18 Months		
Raw material required for generation of one unit (Rice Husk & Other Biomass Fuel)	1.12 kgs		
Cost of Raw material	0.85 Rs./kg		
Escalation	5% Every Year		
Water charges	1.50 Rs./KL		
Water required	720 KL/day		
O & M Cost (% of Project Cost less margins)	4.0%		
Escalation	5% Every Year		
Administrative Expenses(%of project cost less Margins)	1.0%		
Escalation	5% Every Year		
Interest Rate On Rupee Loan	12.00%		
Interest on Working Capital Loan	11.50%		
Working Capital Margin	25%		

with the normal depreciation. Hence the Commission is of the view that the total amount of normal depreciation plus AAD may be allowed at 7% of the project cost per annum on SLM for 10 years for the purpose of tariff computation. Since the project cost includes certain non-depreciable assets like land and margin money for working capital, 7% on the entire project cost is considered appropriate as benchmark depreciation for the purpose of computation of tariff.

(12) Fuel Cost

The petitioner had suggested a fuel cost of Rs. 900/- per metric ton in the initial filing. Subsequently, a fuel price of Rs. 1000 per MT for biomass fuel has been proposed. During hearing and discussions, the petitioner submitted that the prevailing prices of rice husk varies from Rs. 850 to Rs. 900 per metric ton. Due to increase in the capacity of biomass-based generation plants in the State, the cost of rice husk is likely to go up as has been the experience in Andhra Pradesh. It was also argued that their fuel requirement is to be met from rice husk only. The petitioner submitted that landed cost of coal varies from Rs. 1200 to Rs. 1500 per metric ton and hence the usage of coal is uneconomical. CREDA in its calculations has proposed the fuel cost at Rs.800/900 per MT. The CSEB, on the other hand, has stated that the price of rice husk in the State varies from Rs. 400-700 per MT and hence the average price based on actuals should be considered.

The price of biomass is the key factor in the variable cost of generation. The Commission notes that the fuel cost determination for biomass projects is a complex exercise as it depends upon the nature of fuel and its availability, combination of fuels used by different plants, location of the plants near to the fuel source, etc. The prices quoted by various agencies vary widely. The fuel used in these power plants will be rice husk, agricultural residues, coal and in some cases wood chips as mentioned in different DPRs submitted by the petitioner. In Chhattisgarh rice husk is available in large quantities and most of these non-conventional plants will use rice husk as a major fuel, which may be supplemented by wood chips and any other biomass. Transportation

cost of rice husk is likely to be less. As per the DPRs the location of the most of the biomass plants is such that their need for fuel can be met from the nearby areas. Further, coal is also available in the State, which may be mixed with rice husk to the extent permissible. Thus the transportation cost of fuel will be low. The price of the rice husk in the DPRs ranges from Rs.500 to 850 per MT. Although the petitioner has demanded for Rs.1000/- per metric ton as fuel cost, the Commission is of the view that considering the over all position, the average fuel cost should be Rs.800 per metric ton. Based on the information provided, the Commission has decided to consider the fuel price at Rs 800 per MT. The Commission also decides that the use of a maximum of 25% conventional fuels would be allowed on yearly basis in such projects, if required to be used as support / supplementary fuel.

Fuel Cost escalation:

The petitioner has proposed fuel price escalation of 6 %. CREDA has suggested escalation of 5% in O&M expenses for computation of tariff. The other State Commissions, such as of Karnataka, Andhara Pradesh and Maharastra, have considered fuel cost escalation of 5%. This Commission also considers escalation on fuel cost on the same basis, as the escalation considered in O&M expenses, of 5% per annum.

(13) Specific Fuel consumption

The petitioner has assumed 1.16 kg /kwh based on calorific value of 3200 kcal/kg and station heat rate of 3700 kcal/kwh. The CEA has specified a gross heat rate of 4500 Kcal/Kwh and average calorific value of 3300 Kcal/kg. Considering these parameters, the CEA has arrived at specific fuel consumption of 1.36kg/kwh. Out of the 16 power stations considered by the CEA, 13 are from Andhra Pradesh, where rice husk, julie flora, cotton stalk, wood chips maize shells, sugar cane trash, dall shell, chilly stalk, are