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REQUEST FOR REVIEW

Ramgarh Chini mills RE project
Project 1003

Two of the request for reviews outlined points 1-3 below and one outlined points 1-2, we have provided all three points and provided responses below.

Request for review

1. Further evidence regarding the validation of the input values of the IRR should be provided. In particular the assumptions regarding electricity prices received by the project participant should be substantiated.
2. The value used for electricity generation in the estimation of CERs is 68,006MWh whereas the value used in the IRR calculations is 60,826MWh. This 10% difference should be more transparently explained.
3. The baseline emission factor (0.914 tCO2/MWh) is higher than the factor published by the Central Electricity Authority of India (0.75 tCO2/MWh). This discrepancy should be explained.

Requirement: The project participant shall apply an approved monitoring methodology.
Assessment: CERs will be based on the lower of the project plant output or the total site output less

Question 1 – Further evidence regarding the validation of the input values. In particular the assumptions regarding electricity prices received by the project participant should be substantiated.
All supporting evidence underlying the financial analysis was provided during validation, this is shown in the validation report through CL3. These supporting evidences have now been provided again as attachments. The following table however summarises the revenues and costs of the project and the evidence provided against each item.

Item	Justification
Investment cost	A spreadsheet detailing investment costs was provided at validation and has been attached as a spreadsheet "Ramgarh – project cost.xls"
Operating costs	
Allowances for trippings	This was set at 10% and taken from a survey of a substation in UP which resulted in a survey figure of 18% losses. The data underlying this was presented at validation and has been attached in a spreadsheet format "Tripping data.xls"
O&M	Set at 2.5% of investment cost. This is in line with the UPERC tariff order and the link to this was provided at the time of validation, http://www.uperc.org/Copy of Order -UPERC NCE Policy FINAL DT.18-7-2005.pdf Page 18 of this tariff order.
Admin	This was set at 5% of revenues but was justified by actual expenses in the previous year at the sugar factory and the budgeted expenses for the forthcoming year. This spreadsheet has been attached "RCM Expenses.xls".
UPEB maintenance	10% of the cost of the line. A justification for this was provided at validation and is detailed in the footnote[1]. Already a pylon and 3km of line has

[1] "As you had pointed out in the financials for Ramgarh we have assumed that the line maintenance cost will be 10% of the investment cost in the transmission line and bay. The reasoning behind adopting the level of 10%

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	been stolen and a FIR ("police report") for this theft has been attached.
Net billable	At the time of validation a 2.5% deduction was in the PPA but the actual figure being deducted by UPEB was 2% against the amount billed and so this was used in the financial analysis. This has now been reduced to 1.25% and the evidence for this has been provided from the Ramgarh PPA (this reduction does not have any significant impact on the financial analysis it increases the IRR from 9.16% to 9.41%).
Revenues	
Electricity sales	The UPERC Tariff Order was provided at the time of validation and prices set out in this were followed in the financial analysis. We have now provided a copy of the PPA which follows this Tariff Order. As the term of the PPA does not cover the full crediting period it was assumed the final price was carried through the remaining period. The sensitivity analysis then looked at increasing prices. This information is contained within the PDD, sub-step 2d of section B5.

Question 2 – The value used for electricity generation in the estimation of CERs is 68,006MWh whereas the value used in the IRR calculations is 60,826MWh. This 10% difference should be more transparently explained.

At the time of validation we used input values in the spreadsheet that result in a conservative financial analysis, i.e. the highest IRR. In this regard the project IRR is most sensitive to the days of operation. Any increase in days of operation will improve the IRR but will also increase the estimation of expected generation. However as emission reductions will be determined on actual generation it would seem to be more important to focus on additionality and this was our approach. We therefore used the number of days in our analysis that is credible for the particular plant and which would produce the highest IRR, this was 180.

Using 180 days we arrive at expected future generation of 87,091 MWh for the total generation of all the units of the power plant which includes 77,760 MWh for the new power plant. In order to arrive at the qualifying generation for CERs we take the minimum of (new power plant generation or total generation minus historic generation). The historic generation has been set at 19.085 MWh in Annex 3 of the PDD. We therefore arrive at 68,006 MWh as qualifying generation, EG_y, (87,091 – 19,085).

In terms of calculating exports under the 180 day scenario we assume that exports will be equal to the total generation of all the units less the demand of the adjacent sugar factory. The sugar factory demand has been calculated on the basis of the number of days and not at the historic figure of 19,085

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really relates to the uncertainty surrounding these costs. As pointed out the project activity will be responsible for maintenance of the bay and the 28km transmission line. The project activity has no expertise in line maintenance nor any experience in the likely costs of line maintenance hence these are estimated. However these estimates of the costs of maintenance are compounded by two factors.

If the line or bay does fail the project will not be able to provide power to the grid and therefore will lose revenue from the sale of power. A one day loss of power sales equates to a cost of over Rs 1m. Furthermore the second factor that has provided major concern to the project is the prevalence of line thefts, where individuals will try to steal the line.

More generally the level of these costs are not that significant in terms of the qualification of the project, if we assume that costs will be 5% of the investment then the IRR only increases by 0.43% and even taking an extreme case and setting these costs at zero only increases the IRR by 0.86% and does not increase it above the benchmark.

We trust this answers your question but are available to provide any further clarifications should you require them."

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MWh as it will depend on the crushing days of the sugar factory. This yields a sugar factory demand of 26,266 MWh and subtracting this from total generation yields exports of 60,826 MWh.

The difference is therefore explained by the number of days of operation taken for the IRR analysis (180) which is more than the historic number of days the plant has operated (see below). The use of 180 days has been selected because it provides a higher (conservative) IRR

The following table shows the historic generation for the plant and the number of days the plant operated in each year (supporting evidence for this has been provided in the form of an RT8).

Year	Generation	Days
2003/04	16,491	128
2004/05	18,711	151
2005/06	22,054	157

Obviously the number of days of operation in the future will vary, dependent primarily on weather and sugar cane prices. To provide a more realistic assessment of the CERs received we substitute 180 days with the average days over the last 3 years, 145 days. Under this scenario the sugar factory consumption is estimated at 21,158 MWh (compared to the historic value of 19,085 MWh) and the MWh used to calculate CERs are 51,072 MWh and the MWh exports are 48,998 MWh. The difference in sugar factory electricity demand between the calculated number and the historic number under this scenario can be explained by stoppages of the sugar factory when electricity would not be consumed (from the RT8s provided it can be seen that this was 8% in 2005/06 – 279 hours were lost to stoppages out of a total 3473 hours of operation). Therefore this difference can be explained by the actual operation as the difference between 21,158 and 19,085 is equivalent to 272 hours or 7.8% stoppages[2].

A means to solve the problem of estimating emission reductions is to use the average days of operation of the last 3 years and present the emission reductions from this average in the PDD.

Question 3 – The baseline emission factor (0.914 tCO2/MWh) is higher than the factor published by the Central Electricity Authority of India (0.75 tCO2/MWh).

The points referring to "requirement" and "assessment" under this point of the request for review have been ignored as we believe these are mistakes.

The validation report outlined the main reasons why the CEA CEF was not followed[3], this was mainly due to issues of transparency relating to the calculations and the ability to replicate the results. We have provided more explanation on these issues which we believe supports our own independent calculation of the CEF. There has been some pressure in India to achieve a common CEF across project activities, however the CEA CEF is not calculated nor mandated by the Indian DNA and we therefore feel given the justifications outlined below our determination should be acceptable.

The CEF used in the case of the project activity was determined through a calculation of a Combined margin for 2004/05 from publicly available data, since submission sources underlying our calculation have been updated and also the CEA CEF number have been updated for 2005/06, however we present below our CEF analysis for 2004/05 in comparison to the CEA CEF 2004/05 result. (Whilst there have been some updates to the earlier data sets in the June 2007 CEA CEF update this has not affected the earlier CEA CEF for the Northern region for 2004/05[4]).

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[2] If the actual crush days are less than the 3 year average then the MWh relating to CERs will be lower than the MWh exported, if the actual crush days are higher than the 3 year average then the MWh relating to CERs will be higher than the MWh exported. These scenarios are shown in the attached spreadsheet "Review Ramgarh, exports.xls".

[3] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

[4] Whilst some of the historical data has changed in the CEA CEF database this does not affect the Northern grid, page 16

"5.3 Changes compared to Previous Database Versions

In comparison with the previous version of the Database (Version 1.1), this version includes some small changes, which affect the emission factors for the Fiscal Years 2000-01 to 2004-05. The most notable of these changes are summarized below.

• North-East: The operating margins and the build margin 2004-05 increased slightly in comparison with Version 1.1. The reason is that actual fuel consumption data became available for some stations.

The following table outlines the differences in the CEA CEF and our CEF for the determination of the 2004/05 Combined margin.

Northern region grid CM	CEA, tCO2/MWh	Our, tCO2/MWh
2004/05	0.75	0.914

The reason why we have not used the CEA CEF data is that we do not believe it can or has been validated by any DOE. The data in the tables provided by the CEA CEF are hard coded and there is no reference to supporting documents that make the information publicly available (see http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm and the data contained in the spreadsheets presented). Without transparency and sources we do not believe the CEA CEF should be used as the methodology specifically states:

> "Calculations for this combined margin must be based on data from an official source (where available)[4] and made publicly available." Page 5, ACM0002, version 6

We had initially calculated the Indian CEF in 2004 and from there updated and refined our database drawing on publicly available information mainly, from CEA sources published their website. Whilst the review asks for an explanation of the discrepancy the main problem in providing this is the lack of transparency in the presentation of the underlying data the CEA CEF uses, the generation data is provided but there is no source to the information on the fossil fuel consumption of the stations/units nor the NCV of the fossil fuels[5]. The user manual refers to some default values but says in the majority of cases that station or unit level data has been used but it does not distinguish where these differences in sources arise[6]. In our determination of the Northern regional CEF we have adopted an approach that follows the guidance in the methodology explicitly and used data from official and publicly available sources which allows ready checking and validation by the DOE (the same cannot be said of the CEA CEF).

If we examine our sources of data against those of the CEA CEF it sheds some light on where the differences arise but without specific information on the actual data used in the CEA CEF or the source (be it the default data they provide in the user manual or the station/unit specific data) it is difficult to show how the final calculated figures differ.

Data item	CEA source	Our source
Generation of station/unit	Individual power plants or station heat rates	Monthly generation report, published on CEA website
Fuel consumption of station/unit	Individual power plants	Performance review of thermal power plants, published by CEA General review, published by CEA
NCV	Individual power plants or default values	Indian National Communication
EF	Indian National Communication	Indian National Communication
Oxidation factor	Coal and lignite from tests conducted, others from IPCC 2006	IPCC 1996[7]

Where we can provide a direct comparison is in the generation data used for the plants in the OM, our generation data was taken from the CEA website (where monthly generation for each plant in each

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• South: The operating margins and build margin decreased slightly for some years. Again the main reason is that actual fuel consumption became available for some stations.
• West: The build margin 2004-05 decreased slightly due to some changes in the composition."
Source: CO_2 Baseline Database for the Indian Power Sector, User guide, version 2, June 2007

[5] The CEA CEF actually uses GCVs and converts these to NCVs.

[6] Page S1 The calculations are based on generation, fuel consumption and fuel quality data obtained from the power stations. Typical standard data were used wherever precise information was not available.
Source: CO_2 Baseline Database for the Indian Power Sector, User guide, version 1.1, December 2006

[7] At the time of submission the 2006 IPCC data was not published.

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region is listed). To arrive at yearly generation it is possible to use examine the data for March which lists year to date (the CEA year runs April – March). The data is on the CEA website (www.cea.nic.in) and the downloads of this have been attached, we have provided data for the last 3 years and shown the difference.

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Comparison of Generation data

	2002/03			2003/04			2004/05		
	Generation data taken from CEA monthly report, GWh	CEA CEF database, GWh	Diff	Generation data taken from CEA monthly report, GWh	CEA CEF database, GWh	Diff	Generation data taken from CEA monthly report, GWh	CEA CEF database, GWh	Diff
Badarpur	5284	4811	473	5432	4943	489	5464	5463	1
I.P.Stn.(DVB)	619	547	72	771	669	102	921	920	0
Rajghat(DVB)	837	739	98	775	683	92	696	697	-1
Faridabad	973	850	123	795	850	-55	869	868	1
Panipat	4994	4486	508	5949	4486	1463	6008	5757	251
Bhatinda	2497	2266	231	2553	2308	245	1993	1992	1
Lehra Mohabbat	2907	2646	261	3379	3079	300	3308	3309	-1
Roper	8246	7565	682	8303	7612	691	9082	9083	0
Kota	6551	5915	636	6758	5792	966	7751	7431	320
Suratgarh	7289	6490	799	8303	7419	884	9363	9362	0
Anpara	11693	10690	1003	11982	10997	985	11511	11509	1
Harduaganj	769	652	117	733	615	118	632	631	1
Obra	6528	5786	742	6247	5509	738	5550	5553	-3
Panki Extn.	1016	937	79	1065	985	80	1043	1043	0
Paricha	961	765	196	655	523	132	966	967	-1
Tanda (NTPC)	2223	1921	302	2912	2650	262	3320	3317	3
Unchahar (NTPC)	6151	5626	525	6454	5868	586	6781	6781	0
Rihand STPS	7752	7128	624	7958	7347	611	7987	7988	-1
Singrauli(STPS)	16168	14769	1399	15644	14479	1165	15806	15803	3
NCTPP(Dadri)	6043	5555	488	6185	5683	502	6830	6831	-1
I.P GT	935			957			1162		
I.P. WHP	280	1187	28	253	1189	21	378	1540	1
Pragata CCGT	825	813	12	2405	2345	60	2551	2552	-1
F'bad CCGT	2697	2645	52	2792	2727	65	3162	3162	0
Pampore GT	58	57	1	29	29	0	24	24	0
Ramgarh GT	161		-49	241		35	343		0
Ramgarh ST	0	210		0	206		17	360	
Anta GT (NTPC)	2760	2679	81	2777	2702	75	2785	2785	0
Auraiya GT	4272	4140	132	4252	4122	130	4120	4118	2
Dadri GT	5212	5068	144	5062	4930	132	5458	5457	1

Continuation Sheet

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In terms of the build margin we have undertaken some analysis on the plants that arise in our data set and those that arise in the CEA CEF dataset. However we can only comment on our dataset as again sources are not provided in the CEA CEF dataset.

In the analysis of the 2004/05 build margin our list of plants includes Suratgarh as the first plant (i.e. the earliest in our list). We have taken the date of commissioning of the plant as 01/02/1999 which is its date of commencement of its commercial operation. The CEA CEF on the other hand considers the date of commissioning as 10/05/1998, which is its date of synchronization on oil. This can be verifed from www.rajenergy.com/Genco.htm. Thus by omitting Suratgarh the CEA CEF includes two other power plants which come next in reverse chronological order the Unchachar power plant and GHTP (LEH. MOH). The date of commissioning of Tanda unit 4 is not publicly available (only the time period i.e. between 1998 and 1999) to be conservative we took this as 30/12/1998 as it is a thermal power plant, http://cercind.gov.in/031105/8-05.pdf#search=%22UPSEB%20Tanda%22.

As we only have power plant level data we have apportioned the total generation across the added generation capacities, whilst the CEA CEF has allocated the generation to the particular unit when it is known, which may lead to some differences in the generation data under the build margin. The data regarding the hydro power plant Sewa III (9 MW capacity), Jammu and Kashmir, was wrongly typed as Gumma (3MW). This error has now been rectified and the new value of BM has been calculated accordingly (this does not however significantly change our calculation of the BM).

We do not believe that we can provide any further information in addition to that outlined above given the lack of information contained with the CEA CEF numbers. If it is felt by the EB that our response is not sufficient we request you suggest the use of either the CEA CEF for this project activity or another source rather than place the project activity under review on this point.

Evidences provided

Annex I – PPA
Annex 2 – RT8 for 2003/04, 2004/05 and 2005/06
Annex 3 – Relevant extracts of order copies
Annex 4 – FIR ("Police report")
Spreadsheets as detailed in the text.

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