CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

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Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

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Title : 7.5 MW renewable energy generation for a grid, Karnataka, India
Version: 03 dated 30/04/2007

A.2. Description of the small-scale project activity:

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The purpose of the project activity is to utilise available biomass fuels in the region to generate clean power for the grid system owned by the state owned power utility, Karnataka Power Transmission Corporation Limited (KPTCL).

The plant location was selected based on surplus availability of biomass in the form of agro-industrial residue such as rice husk and other crop residues. The annual biomass requirement for the 7.5 MW plant is estimated as 75,000 tonnes. A detailed survey for fuel availability was carried out and found that surplus biomass is available in the Koppal District of Karnataka.

In the event of non-availability of sufficient quantity of biomass, the project participants may utilise coal as supplementary fuel, as permitted by the Ministry of Non-conventional Energy Sources. However, the maximum quantity of coal that can be co-fired is restricted to 25% of the annual total fuel requirement. The project proponents considered on a conservative basis usage of coal to an extent of about 10% of total fuel as supplementary fuel during the operational life time of plant.

Apart from export of surplus power to the state utility, the other objectives of the project activity are:

a) Sustainable Development, through utilisation of biomass and crop residues
b) Mitigation of local environment pollution and health hazards
c) Climate change mitigation, through renewable energy generation and reducing the demand for fossil fuel based power
d) Contributing to the national electricity capacity through additional power generation

The following local benefits are expected due to the project

- Proper utilisation of locally available biomass resources.
- Generation of additional income for rural farmers due to creation of commercial value for the neglected biomass
- Generation of eco-friendly green power and contribution to the availability of quality power in rural areas (due to the project located in rural area);
- Creation of indirect employment for rural unemployed youth due to requirement of collection of biomass through out the year.
- Creation of direct employment for both skilled and unskilled person during the operation of the plant
- Contribution to the sustainable development through generation of renewable energy for a grid system that is predominantly conventional fossil fuel based. By utilising renewable energy sources the project reduces demand / use of fossil fuels for power generation.

View of project participant about the project activity's contribution to Sustainable Development

Ministry of Environment and Forests (MoEF), Government of India, has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects.

1. Social well being
2. Economic well being
3. Environmental well being
4. Technological well being

The project activity contributes to the above indicators in the following manner.

Social well being

The 7.5 MW biomass based power project caters jobs for number of persons in the rural area during construction phase and is catering presently in various ways like biomass collection, processing of biomass, transportation of biomass as well as in the operation of the power plant. Apart from the direct employment generation, project also encourages indirect employment by setting up other agro industries due to availability of power supply from the project.

Commercial value to agricultural residues will encourage the farmers to collect biomass from fields which will improve the income levels of the farmers.

The project has engaged both genders during construction of the project and it will continue in biomass collection, biomass processing etc during operation lifetime of the project and this will lead to increase in gender equity and prevents social disparities.

Economic well being

The project will bring in additional capital investment and indirectly supports creation of local infrastructure like roads, schools and other basic civic amenities. The capital investment in the local area is at a cost of Rs.322.9 millions.

The project acts as a nucleus for other economic activities such as setting up of cottage industries, shops, hotels etc around the area contributing to the economic development around the project area.

The project activity helps local farmers in earning extra income by selling crop residues there by helping them to improve their economic standards.

The biomass based power generating plant facilitates the availability of continuous and sustained power to the local industries and agricultural farmers located in remote areas, there by avoiding the load shedding and low frequency of power.

Environmental well being

The project activity utilises biomass potential available for power generation, which otherwise is dominated by fossil fuels such as coal, lignite and gas. The project will not result in increase of GHG emissions and cause no negative impact on the environment. The project generates real, measurable and long-term emissions reductions.

The project utilizes surplus biomass residues and thereby reduces dependence on fossil fuels to certain extent.

The project conserves local resources, reduces pressure on the local environment to some extent, provides improved health and other environmental benefits.

Technological well being

The CDM project activity leads to increase in utilization of biomass resources for power generation and contributes to the energy security in the country.

The above benefits due to the project activity ensure that the project is contributing to the sustainable development of the region.

A.3. Project participants:

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Name of the party involved ((host) indicates a host party)	Private and/or public entity (ies) project participants	Whether party involved wishes to be considered as project participant
India (Host)	**Private Entity:** Ravikiran Power Projects (P) Limited, Hyderabad	No.

A.4. Technical description of the small-scale project activity:

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A.4.1. Location of the small-scale project activity:

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A.4.1.1. Host Party(ies):

>>

India

A.4.1.2. Region/State/Province etc.:

>>

State : Karnataka

A.4.1.3. City/Town/Community etc:

>>

District : Koppal
Taluk : Gangavathi
Village : Marlanhalli

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

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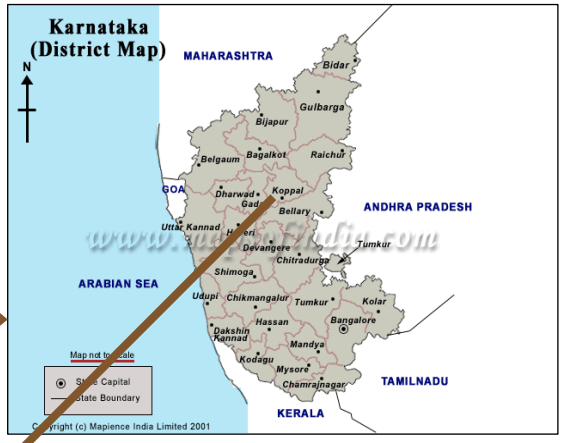
The project is located at Marlanhalli Village, Gangavathi Taluk, Koppal District of Karnataka. The plant is well accessible by road and rail. The nearest railhead is at Koppal, at a distance of 80 kms from the project location. The nearest seaport is at Panaji at a distance of 350 kms.

Physical location of the project is marked in the maps below.

Map1: Location of Karnataka state in India



Map2: Location of Koppal district in Karnataka

Map3: Location of 7.5 MW biomass based power project in Koppal District

A.4.2. Type and category(ies) and technology of the small-scale project activity:

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According to Appendix B to the simplified modalities and procedures for small-scale CDM project activities the project activity falls under Type I, Renewable energy projects since the project activity utilising renewable biomass as the main energy source for electricity generation. Since, the generated electricity is being exported to the regional grid system, the applicable category is I.D., Renewable electricity generation for a grid.

Accordingly, the applicable methodology for the project activity shall be AMS I.D., Version 10, dated 23rd December 2006, which includes renewable biomass for electricity generation for a grid system.

Since, the capacity of the CDM project is only 7.5 MW, which is well below the qualifying capacity of 15 MW, the project activity is a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures can be applied. Since, the maximum electricity generating capacity is limited by the design of the plant and machinery and by the license issued by the state authorities, there is no possibility of exceeding the limits of small-scale CDM project activities during the crediting period and the project activity will remain as a small scale project activity.

Technical details of the project activity

The project is designed to generate electricity for grid system using multi-fuels. The basic technology is Rankine cycle route where direct combustion of biomass materials takes place through the multi-fuel fired boiler to generate high pressure and high temperature steam, which drives an impulse turbine generator set.

No technology transfer is envisaged for the proposed CDM project activity.

The plant and machinery of the project consists of one number traveling grate boiler, one number steam turbine generator set, power evacuation system and fuel handling system etc. The electricity voltage level generated by the turbo generator is stepped up to the voltage that is suitable to interface with the grid electricity. Other plant equipment includes fuel conveyors, electrostatic precipitator, power evacuation facilities, water treatment plant, cooling tower, compressed air plant etc.

The capacity of the turbo generator is 7.5 MW, which generates electricity at 11 kV. Average annual estimate of power export to the grid system is around 45.19 GWh.

Technical specifications of the some of the important items of plant and machinery:

Boiler

Type : Travelling Grate, Bi-drum, natural circulation, water tube
Boiler capacity (100 % load) : 27 tons / hour
Steam pressure at super heater outlet : 65 ata
Steam temperature at super heater outlet: 485^{o}C

Turbo generator

Type : Condensing, impulse type with one bleed-off
Steam pressure at the TG inlet : 62 ata
Steam temperature at the TG inlet : 480^{o}C

Steam inlet quantity : 26 tons/hour
Generator Voltage : 11 kV
Frequency : 50 Hz
Power factor : 0.8
RPM : 3000
Condenser type : Surface condenser / Water cooled

Water
Water requirement : 50 m^3 / hour

Power evacuation
Grid Voltage : 110 kV
KEB substation : Gangavathi 110 / 33 kV (1.5 kms from plant)

Auxiliaries

Fuel handling : Series of belt conveyors
Chimney : 84 mts, RCC
Demineralization plant capacity : 2 m^3 / hour

Ash handling
Bottom Ash : Submerged conveyor
Fly ash : Screw feeder

Cooling tower
Type : Induced draft, RCC
Capacity : 1600 m^3 / hour

Air compressor
Capacity : 50 NM^3 / hour
Type : Reciprocating, Non-lubricated

Energy info (Annual Average)
Gross generation (for optimum year) : 50.49 GWh
In-house auxiliary consumption @ 10.5% : 5.30 GWh
Net generation supplied to grid (optimum): 45.19 GWh

The actual specifications of the equipment would depend on the detailed engineering of the plant.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

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Project activity and baseline scenario

The project activity is a 7.5 MW biomass based power plant , which has commenced its operations in July 2005. The project activity is supplying the generated power to the southern grid of India, leading to the displacement of Carbon intensive electricity by power generation from a renewable energy source.

The baseline scenario in the absence of project activity continuous to be carbon intensive and emission reductions generated by the project activity are additional. The associated emissions are calculated based on the net amount of electricity fed into the grid and the simple weighted emission factor for the grid.

The CDM project activity generates electricity using surplus biomass, which otherwise would have been left for decay in barren lands or it would have been burnt causing environmental pollution. The GHG that are emitted after combustion of biomass in the boiler is mainly CO_2. However, the CO_2 is absorbed by plant species for growth. The biomass is therefore CO_2 neutral and thus environmentally benign limiting greenhouse effect. Hence, electricity generation by the project activity is non-GHG source and it is expected that the proportion of fossil fuel based generation in the grid will be reduced by the project activity leading to lesser carbon intensity in the grid. Thus the project activity is providing non-fossil electricity production capacity to the regional system, thereby reducing the demand for fossil fuel fired power generation and resulting in reduced anthropogenic GHG emissions.

Energy demand in the region is constantly increasing. To meet the growing energy demand, various private and public sector utilities have envisaged many new projects that are expected to become operational in the near future. As of now the share of thermal power generation is 56 % in the total installed capacity of southern region (Refer Table A.1). The majority of the projects proposed are based on fossil fuels such as coal, lignite, gas, etc., which result in GHG emissions. Nuclear capacity additions are not anticipated either, due to continuous rising environmental consciousness and long gestation periods coupled with huge investments. Hence, the baseline scenario in the region, for expanding electricity production capacity, is driven by fossil fuel fired power stations. As a result, the baseline is highly carbon intensive.

Thus the project activity is providing new non-fossil electricity production capacity to the regional system, thereby reducing the demand for fossil fuel fired power generation and resulting in reduced anthropogenic GHG emissions.

Table A.1: Fuel wise breakup of Installed Capacity in the Southern Region grid[1]

S. No	Fuel	Capacity (MW)	Percentage (%)
1.	Thermal	20488.1	56
2,	Hydro	10967.8	30
3.	Nuclear	880	2.4
4.	Wind & RES	4233.5	11.6
Total		**36569.4**	**100**

[1] Page No: 43, 47, Power Scenario at a Glance – June 2006, Central Electricity Authority (CEA), www.cea.nic.in

Additionality

The project activity is not the baseline scenario and the emission reductions would therefore not occur in the absence of the project activity. The project activity is not required by law, and the national and state policies in place are not sufficient to make the project commercially viable on its own.

The project faces barriers, which in the absence of CDM would be prohibitive. These barriers include:

Investment Barriers
Prevailing Practice – One of the first few biomass plants initiated in the state of Karnataka
Technological barrier – Difficulties in handling different types and characteristics of biomass material to use in the boiler.
Other barriers – Uncertain Tariff policies, barriers related to fluctuations in biomass price, handling and storage.

CDM will help to make the project activity viable. The CDM revenues will help to deal with the various risks described above.

For details on baseline, additionality and National / Sectoral policies, refer Section B2 and B3.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

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The chosen crediting period for the project activity is 10 years. It is estimated that the project activity would generate 240,610 CERs during the crediting period. Annual estimates of emission reductions by the project activity during the above crediting period are furnished below.

S. No	Year	Annual estimation of emission reductions in tonnes of CO2 eq.
1	2007-08	24,061
2	2008-09	24,061
3	2009-10	24,061
4	2010-11	24,061
5	2011-12	24,061
6	2012-13	24,061
7	2013-14	24,061
8	2014-15	24,061
9	2015-16	24,061
10	2016-17	24,061
Total estimated reductions (tonnes of CO_2 eq.)		**240,610**
Total number of crediting years		**10**
Annual average over the crediting period of estimated reductions (tonnes of CO_2eq.)		**24,061**

In the above table the year 2007-08 corresponds to 01.04.2007 to 31.03.2008. Similar interpretation shall apply for subsequent years. It is also made clear that the project proponents are not seeking any retroactive credits before the registration of the project activity with CDM Executive Board.

A.4.4. Public funding of the small-scale project activity:

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No public funding from Annex I Parties is available in this project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

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The project proponents hereby confirm that the project activity is not a debundled component of another larger project activity.

The project proponent further confirm that they have not registered any small scale CDM activity or applied to register another small scale CDM project activity within 1 km of the project boundary, in the same project category and technology/measure in the previous 2 years.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

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Title : Type I, Renewable Energy Project.
Reference : I.D. Renewable Electricity Generation for Grid
Version : 10 (23rd December, 2006)

B.2 Project category applicable to the small-scale project activity:

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The project category is renewable energy generation for a grid system which is fed by both fossil fuels fired generating plants and non-fossil fuels based generation plants. Hence the applicable baseline is as per Para 9 b of the methodology I.D. Version 10, the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in $kgCO_2/kWh$) calculated in a transparent and conservative manner.

Table B.1 Key information and data used to determine baseline scenario

Key Parameter	Value	Data Source	Website
CEF for fuel	Carbon Emission factor for each fuel type	Revised 1996 IPCC Guidelines provides default emission factors for fuels	www.ipcc.ch/
Oxidation factor	Oxidation factor for each fuel type	IPCC provides default Oxidation factors for fuels.	www.ipcc.ch/
EFy	Baseline emission factor for the project grid	CEA published CO_2 data base values contains Emission Factors for each regional grid in India.	www.cea.nic.in

EGy	Power export to the grid per annum	From Plant and KPTCL Records	------

Emission Co-efficient

There are two methods for estimating the baseline emission factor under clause 9 of the selected methodology AMS I.D. as follows.

(a) The average of the "Approximate Operating Margin" and the "Build Margin", where:

i. The "Approximate Operating Margin" is the weighted average emissions (in tCO2eq./kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

ii. The "Build Margin" is the weighted average emissions (in tCO_2eq./kWh) of recent capacity additions to the system, which capacity additions are defined as the greater (in MW) of most recent 20% of existing plants or the 5 most recent plants.

OR

(b) The weighted average emissions (in tCO2eq./kWh) of the current generation mix.

The project activity is displacing grid electricity, which is fed by both fossil, and non-fossil fuel based generation sources. Keeping in view of the electricity scenario, the entire Southern region electricity grid system with its expansion plans, generation and investment trends is considered for identifying the baseline.

CEA published Grid emission factors have been applied for the project baseline. The weighted average emission factor is applied for the project baseline calculations, which is low compared to combined margin, leads to less baseline emissions and hence, conservative. The ex-post approach is selected for baseline calculations, where emission factor will be monitored every year during the crediting period. The expost approach considered is conservative since it reflects best actual grid scenario (emissions) of the year in which emission reductions will be claimed.

The value applied for ex-ante calculations of emission reductions is 780 tCO_2/GWh, published by CEA for southern region grid. The value taken is latest available at the time of PDD submission for registration. However, the same will be updated expost during the crediting period.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

>>

The capacity of the CDM project is 7.5 MW and the project activity is generation of electricity for a grid system using biomass residues. Hence, the type and category of the project activity meets the criteria specified under I.D. in Appendix B of the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities.

UNFCCC simplified modalities seek to establish additionality of the project activity as per Attachment A to Appendix B, which listed various barriers, out of which, at least one barrier shall be identified due to which the project would not have occurred any way. Project participants identified the following barriers for the proposed project activity.

Prevailing practice:

The project proponents have commenced efforts to establish a biomass based power plant in the year September 2001 (License obtained from the Government of Karnataka is attached-1). At the time of envisaging the project in the year 2001, there was only one plant " i.e 4.5 MW Malavalli Power " which was commissioned in the State of Karnataka, when the project proponent received the license. This project also subsequently registered as CDM project with UNFCCC under Ref. 0298 dt.21st July'06. The biomass plants commissioned in Karnataka based on the date of commissioning is furnished below.

Table B.4 Biomass Power Plants in Karnataka

Name of the project	Capacity (MW)	Date of commissioning
Malavalli Power	4.5	July 2001
Base Power	7.5	September, 2003
R.K.Power Gen	20	January, 2004
Sri Indira Power Limited	6	February, 2004
Poweranics Limited	6	May, 2005
Koppal Green Power Limited	6	January 2005
Konark Power Projects Limited	7.5	May 2005
Ravi Kiran Power Projects (P) Ltd. **(Present Project)**	7.5	June 2005
Koganti Power Limited	7.5	December 2005

Source: http://www.kredl.kar.nic.in/VentureBiomassCogen.htm

Therefore the project activity is one of the first few projects started in the state of Karnataka. All the above projects are reported to be pursuing for additional stream of revenue from CDM.

In Karnataka with an installed capacity of 5737[2] MW in 2001, the contribution of biomass for power generation is negligible. Thus it is demonstrated that power generation from biomass is not a common practice in the State of Karnataka.

Investment Barrier:

Low return on Investment:

The investment in any project should yield a return commensurate with the benchmark return (weighted average cost of capital). The weighted average cost of capital consists of two components viz., debt and equity. The cost of debt represents the weighted average cost after taking into account interest subsidy provided by the Ministry of Non-Conventional Energy Sources, Govt. of India. The cost of Equity represents the required return adjusted to various statutory transfers and payments to be made before declaration of dividend. Since in India, declaration of dividend should be preceded by dividend distribution tax and transfer to reserves, necessary provisions have been made for the

above while computing the post-tax cost of Equity. The spread sheet showing the computation is attached. Cost of debt evidencing term loan sanction letters attached-2.

In the case of this project activity, the bench mark return worked out to 16.96%. In contrast the IRR of the project in the base case scenario worked out to 11.82%, which indicates that the project is not viable without CDM revenue. Even under the most optimistic conditions of an increase in Tariff by 5%, an increase in PLF by 5% and a decrease in fuel price by 5%, the IRR of the project activity works out to 14.2%, 13.18% and 12.86% respectively which are below the bench mark return.

The project IRR has also been worked out reflecting the post project scenario considering the present tariff eligible to the proponent at an average of Rs.3.05 (with Rs.3.10 per kWh up to 6 MW generation and at Rs.2.85 per kWh beyond 6 MW and up to 7.5 MW) with an annual escalation of 2%. The base price of fuel is considered at Rs.900 per tonne that was prevailing during project commissioning time. Even in this case the project IRR is working out to 13.93%. To sum up the project IRR in all scenarios is observed to be less than the benchmark return (WACC) of 16.96%.

The IRR calculations and the Benchmark (WACC) worked out in excel sheet together with the assumptions are furnished separately in attachment.

Tariff Uncertainty: The power purchase tariff underwent revision three times since the project was conceived by the Project Proponent (PP). Before the project implementation commenced, the project proponent had entered into a PPA (June 10, 2002) whereby the Karnataka Power Transmission Corporation Ltd. (KPTCL) had agreed to purchase the power generated by the project proponent at Rs.2.25 per kWh with an yearly escalation of 5% on base tariff with base year as 1994-95 (relevant extract from PPA is attached-3). Based on this PPA, the project proponent would have been eligible for a tariff of Rs.3.67 per kWh.

However even before the financial closure (loan agreement signed with the lenders on August 27, 2003), the KPTCL unilaterally cancelled the PPA and revised its tariff to Rs.2.80 with an annual escalation of 2% on base tariff vide its letter dated July 5, 2003 (Letter from KPTCL attached-4) .This is the first uncertainty on power purchase tariff the project proponent faced.

[2] Pg.no. 47, power scenario at a glance, 2006, CEA, www.cea.nic.in

Hence, the tariff considered is Rs.2.80 per kWh with an escalation of 2% per annum.

This uncertainty in power tariff continued even after the proponent commissioned the project in June, 2005 as evidenced by the revised tariff regulation brought out by KPTCL wherein they fixed a differential tariff based on capacity. The tariff had been fixed at Rs.3.10 per Kwh for power generation up to 6 MW and at Rs.2.85 per Kwh for any generation beyond 6 MW and the proponent has entered into an agreement with this tariff on 29th November'05 without any option after commissioning of the project (Supplementary agreement attached-5).

Thus, the proponent faced the tariff uncertainty (which is a barrier for the project) due to frequent revisions by the Utility.

Biomass price and availability uncertainty: Since the project activity was one of the first few projects in the State of Karnataka, the project proponent was confident of getting sufficient quantity of bio mass as proved by the biomass assessment survey carried out at the time of conceptualization of the project. However, as the project creates commercial value for the crop residues, the project proponent were aware already at the time of taking investment decision that there would be strong risk of the price of biomass resources might increase after the project is established. At the time of project planning, there was no past history of prices of crop residues where the requirement is on continuous basis. Moreover, there was also no mechanism for collection and supply of biomass materials. Further, it was also clear that the prices of the biomass resources would be different if they are procured during non-cropping season. Infact, when the project was conceptualized, the biomass prices (landed cost) were estimated at Rs.500-600 per tone and the prices underwent significant change even during financial appraisal of the project. The price went upto Rs.800 per tone at the time of commencement of the project activity. The biomass prices even increased further to Rs.900 to Rs.1000 at the time of commissioning of the project.

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To sum up, the project proponent faced a strong risk of changes in fuel prices as well as uncertainty with respect of availability of fuel at the time of investment decision.

In view of the above, the project is additional and not the same as baseline scenario and would not have occurred without the CDM.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

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As per the guidelines mentioned in Type I. D of Annex B of the simplified modalities and procedures for small-scale CDM project activities, project boundary encompasses the physical and geographical site of the renewable generation source. Hence, the project boundary covers the point of fuel supply to the point of power export to the grid where the project proponent has a full control. Thus, boundary covers fuel storage and processing, boiler, steam turbine generator and all other power generating equipments, and auxiliary consumption units.

B.5. Details of the baseline and its development:

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The baseline for the project activity is constructed according to 9.b. i.e. weighted average emissions of the current generation mix (in $tCO_2eq./kWh$), applicable for Type I.D CDM project activities, as contained in Appendix B of simplified modalities and procedures for small scale CDM project activities.

Date of completion of Baseline: 01/08/2006

Name of the person / entity determining the baseline: Zenith Energy Services (P) Ltd., Hyderabad

Contact details are given below:

Organization:	Zenith Energy Services (P) Limited
Street/P.O. Box, Building:	10-5-6/B, My Home Plaza, Masabtank,
City:	Hyderabad
State/Region:	Andhra Pradesh
Postfix/ZIP:	500 028
Country:	India
Telephone:	+91- 40- 2337 6630, 2337 6631
FAX:	+91- 40- 2332 2517
E-Mail:	zenith@zenithenergy.com
URL:	www.zenithenergy.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Reddy
Middle Name:	Mohan
First Name:	Attipalli
Mobile	+91- 9849408485
Direct Fax	+91- 40- 2332 2517
Direct Telephone	+91- 40- 2337 6630, 2337 6631
Personal E-mail	mohan@zenithenergy.com

The above entity is not a project participant.

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

>>

C.1.1. Starting date of the small-scale project activity:

>>

12/11/2002

C.1.2. Expected operational lifetime of the small-scale project activity:

>>

30 years

C.2. Choice of crediting period and related information:

>>

Fixed crediting period

C.2.1. Renewable crediting period:

>>

Not chosen

C.2.1.1. Starting date of the first crediting period:

>>

Not applicable

C.2.1.2. Length of the first crediting period:

>>

Not applicable

C.2.2. Fixed crediting period:

>>

C.2.2.1. Starting date:

>>

01/04/07

C.2.2.2. Length:

>>

10y – 0m

SECTION D. Application of a monitoring methodology and plan:

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D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

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The name of the monitoring methodology applied for the project activity is "AMS – I.D Grid connected renewable electricity generation" and monitoring procedure applied is ***"Metering the Electricity Generated".*** This is in accordance with Appendix B of simplified modalities and procedures for small-scale CDM project activities. The reference to the proposed monitoring

methodology is Para 13 of AMS I.D of Appendix B of simplified modalities and procedures for small-scale CDM project activities.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

>>

The project activity meets the eligibility criteria to use simplified modalities and procedure for small-scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7. As the power plant is of 7.5 MW capacity, reference has been taken from indicative simplified baseline and monitoring methodologies for selected small scale (CDM projects less than 15 MW) project activity categories.

D.3 Data to be monitored:

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ID number	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
D.3.1	Power	Gross Generation	kWh	m	Continuous	100%	Electronic and Paper	Crediting period plus 2 years	Meter is calibrated and regularly inspected by KPTCL
D.3.2	Power	Auxiliary Consumption	kWh	m	Continuous	100%	Electronic and Paper	Crediting period plus 2 years	Meter is calibrated and regularly inspected by KPTCL
D.3.3	Power	Power Import	kWh	m	Continuous	100%	Electronic and Paper	Crediting period plus 2 years	Meter is calibrated and regularly inspected by KPTCL
D.3.4	Power	Power Export	kWh	m	Continuous	100%	Electronic and Paper	Crediting period plus 2 years	Meter is calibrated and regularly inspected by KPTCL
D.3.5	Fuel	Type of Biomass used	MT	m	Daily	100%	Electronic and Paper	Crediting period plus 2 years	Biomass deliveries are weighted and build upon receipt at the plants
D.3.6.	Fuel	Fossil fuels used	MT	m	Daily	100%	Electronic and Paper	Crediting period plus 2 years	Fossil fuel deliveries are weighted and build upon receipt at the plants
D.3.7.	Calorific Values	NCV of coal used in the plant	kcal/kg	m	Batch-wise for coal	100%	Electronic and Paper	Crediting period plus 2 years	If suppliers' data on calorific value is available for coal, then the same would be considered without testing the sample again.
D.3.8.	Calorific Values	NCV of Biomass used in the plant	kcal/kg	m	Each type of biomass	100%	Electronic and Paper	Crediting period plus 2 years	The samples will be tested periodically once in a quarter except in respect of rice husk where the testing is carried out once in six months. The analysis will be carried out at independent laboratory until the appropriate equipment is procured by the project proponent so that internal testing can be carried out.

D.3.9.	Emission Factor	Grid Emission Factor (EF)	tCO_2/GWh	c	Yearly	100%	Paper	Crediting period plus 2 years	This data item is required for estimating the baseline emissions and emission reductions.

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

>>

Data	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary
D.3.1 & D.3.2	Low	This data item will be recorded at the project site which is under the control of project proponent. The energy generated and consumed is measured using calibrated meters and recorded by project proponent. Records of measurements will be used for calculating net export to grid.
D.3.3	Low	This data will be recorded at the project site and the energy imported is measured using KPTCL calibrated meter. Records of measurements will be used for calculating net export to grid. Sales bills/receipts may be compared as an alternative proof of the power imported from KPTCL grid.
D.3.4	Low	This data item will be recorded at the grid substation, which is under the control of KPTCL. The energy measured using calibrated meters and recorded at KPTCL substation will be monitored. Records of measurements will be used for verification of emissions reductions. Sales bills / receipts may be compared as an alternative proof of the power exported to the grid
D.3.5 and D.3.6	Low	This data item will be recorded at the inlet of the plant premises. Fuel purchase records can be used for verification of fuel purchases in each category of biomass residues and fossil fuels. Payments made to fuel suppliers can be used to cross check the fuel purchase records.
D.3.7 & D.3.8	Low	Fuel samples will be tested by reputed laboratories / for coal will be obtained from coal suppliers (if available). The project proponents have no control on the data parameter. Hence, no QA/QC procedures applicable.
D.3.9	Low	The data values are published by CEA on its official website. Hence, Project participants have no influence on quality control procedures.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

>>

The management structure proposed for monitoring of emission reductions due to the project activity mainly comprises a GHG audit team / committee. The committee was already appointed and authorized to perform various functions such as measuring, recording, storage of measured data and reporting to the project participants. The outcomes of the committee, in the form of GHG audit reports, are being monitored monthly and annually. The committee comprised representatives of the project participant and other experts as decided from time to time. It was proposed that whenever required, external independent GHG auditors would be deputed for the monitoring activities**.**

Project Management

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the Board of Directors. The Board may delegate the same to a competent person

identified for the purpose. The identified person will be the in charge of GHG monitoring activities and necessary reports will be submitted to the management or it's Committee for review.

Monitoring Requirements

The monitoring plan includes monitoring of parameters i.e. the energy fed to the KPTCL grid system, Biomass and fossil fuel consumption, auxiliary consumptions and Imports. Emission reductions resulted from the project activity will be calculated using the energy fed in accordance with the calculations illustrated in Section E of the PDD. Emission reductions generated by the project shall be monitored at regular intervals. The crediting period chosen for the project activity is 10 years.

Monitoring equipment comprises of energy meters and weigh bridge at Project entrance. The export meters will monitor the energy fed by the plant to KPTCL grid system. In accordance with the PPA, project proponents have to install two energy meters one is main meter and the other is check meter. Project proponent calibrates both the meters according to the procedures laid down in PPA. The import meter will record the energy taken by the project activity from Grid system. This meter will be checked, calibrated and may be replaced with a new one by KPTCL based on meter condition. This will be under the control of KPTCL, project proponent have no authorization to deal with import energy meter. The gross, auxiliary energy meters and weigh bridge meter will be periodically checked and calibrated by project proponent as per Indian standards for calibration of equipment.

Methodology adopted for determining base line emission factor is the weighted average emissions of the generating mix in the Southern grid system, which will represent the intensity of carbon emissions of the grid system. The baseline emission factor is calculated ex-post for all the years of the crediting period using the official data published by the Central Electricity Authority for the Southern grid and therefore included in the monitoring procedures.

Leakage Monitoring

The 7.5 MW biomass project is renewable energy type and it utilizes biomass fuel for power generation. Since neither energy generating equipment is transferred from another activity nor existing equipment is transferred to another activity, leakage needs not to be monitored or considered. The project does not lead to any leakage emissions due to 'competing use for biomass' as the availability of biomass in the region is surplus and the same is demonstrated in the section E.1.2.2.

Data Recording and Storage

The net energy fed to the grid system, by the project activity will be recorded by project proponents using either of the two meters (main meter and check meter) in the presence of the representative of KPTCL. Representatives of both the project proponent and KPTCL will sign the document which will contain all details such as the equipment data, calibration status, previous reading, current reading, export, import, net billable units, date and time of recording etc. This document will be used as a basic document for monitoring and verification of the net energy exported to the grid. KPTCL will pay to project proponents based on this document.

Biomass and coal consumption are recorded on daily as well as monthly basis and the same can be verified from fuel entry data maintained at the project site. This document will be used as a basic document for monitoring and verification of the fuel consumption for power generation.

The above document will be preserved for verification of emission reductions from the project, in safe storage. Supporting documents such as receipts of payments released by KPTCL will also be preserved in safe storage for later verification by an independent third party. The period of storage will be 2 years after the end of crediting period.

D.6. Name of person/entity determining the monitoring methodology:

>>

The monitoring methodology was determined and applied by Zenith Energy Services (P) Ltd., with contributions from Factor Consulting + Management AG.

Organization:	Zenith Energy Services (P) Limited
Street/P.O. Box, Building:	10-5-6/B, My Home Plaza, Masabtank,
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State/Region:	Andhra Pradesh
Postfix/ZIP:	500028
Country:	India
Telephone:	+91- 40- 2337 6630, 2337 6631
FAX:	+91- 40- 2332 2517
E-Mail:	zenith@zenithenergy.com
URL:	www.zenithenergy.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Reddy
Middle Name:	Mohan
First Name:	Attipalli
Mobile	+91- 9849408485
Direct Fax	+91- 40- 2332 2517
Direct Telephone	+91- 40- 2337 6630, 2337 6631
Personal E.mail	**mohan@zenithenergy.com**

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

>>

E.1.1 Selected formulae as provided in appendix B:

>>

Appendix B of the simplified modalities and procedures for small-scale CDM project activities does not provide specific formulae for the baseline for project Category I.D.

Calculation of the project GHG emissions reductions applies a weighted average emissions factor for all thermal plants that are operational on the Southern grid of India as of March 2006.

E.1.2 Description of formulae when not provided in appendix B:

>>

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

>>

Due to the project being a CO_2 neutral source of energy, no anthropogenic emissions by sources of GHGs are anticipated within the project boundary due to the project activity, hence no formulae are applicable. However, use of fossil fuels is permitted in exigencies to a maximum of 25% of the total annual fuel requirement for biomass based power projects. Hence, the project may use fossil fuels such as coal in future in case of exigencies.

In the event of coal consumption, the emissions occurring from the burning of coal will be calculated using the following formula.

$$PE_y = \sum EF_{i.y} \,.\, NCV_i \,.\, EF_{co2.\,i} \,.\, OXID_i$$

Where:

PE_y	are the emissions from the project activity during the year *y* in tones of CO_2
$FF_{i,y}$	is the quantity of fossil fuel type *i* combusted to supplement the biomass residues in the project activity during the year *y* in energy or mass units
NCV_i	is the net calorific value of the fossil fuel type *i* in TJ per unit of energy or mass units, obtained from local fuel supplier or from the country specific IPCC default factors
EF_{CO2i}	is the CO_2 emission factor per unit of energy or mass of the fuel type *i* in tons of CO_2 obtained from the country specific IPCC default factors
$OXID_i$	is the oxidation factor of the fuel (as per table 1.29 in the 1996 revised IPCC guidelines for default values)

The project emissions will be updated based on the ex-post monitoring of quantity of coal usage and calorific value of coal. For the purpose of estimating the anticipated project emissions (PE) due to the project activity, it has been assumed that coal to an extent of 10% of the annual fuel requirement will be used as supplementary fuel. The emissions (PE) from coal is deducted from the baseline emissions to arrive Emissions reductions (E 1.2.5). The anticipated project emissions are provided in the table below.

Project Emissions (tCO2)

No.	Year	Biomass consumption	Coal Consumption	Total fuel consumption	coal consumption	Net calorific value of coal	Emission factor coal ($EFCO_2$,y)	Oxidation factor (OXIDi)	Project Emissions
		tons	tons	tons	%	kcal/kg	tCO_2/TJ	-	tCO_2
Reference :						from analysis	1996 revised IPCC guidelines	1996 revised IPCC guidelines	
1	2007	67500	7,500	75,000	10	3800	95.81	0.98	11186
2	2008	67500	7,500	75,000	10	3800	95.81	0.98	11186
3	2009	67500	7,500	75,000	10	3800	95.81	0.98	11186
4	2010	67500	7,500	75,000	10	3800	95.81	0.98	11186
5	2011	67500	7,500	75,000	10	3800	95.81	0.98	11186
6	2012	67500	7,500	75,000	10	3800	95.81	0.98	11186
7	2013	67500	7,500	75,000	10	3800	95.81	0.98	11186
8	2014	67500	7,500	75,000	10	3800	95.81	0.98	11186
9	2015	67500	7,500	75,000	10	3800	95.81	0.98	11186
10	2016	67500	7,500	75,000	10	3800	95.81	0.98	11186
Total Project Emissions									**111860**

In the above table the year 2007 corresponds to 01.04.07 to 31.03.08. Similar interpretation shall apply for remaining years.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

>>

No leakage is anticipated due to the project activity. Though a small amount of emissions occur outside the project boundary due to transportation of biomass, the same are not considered as being negligible and occur in the baseline scenario

Emissions due to Transportation (Biomass & Ash)

	Parameter	Unit	Value
a	Total biomass required for the project	tonnes/annum	75000
b	Average Return trip Distance (AVD) from collection centres*	km	110
c	Total Ash Generation** (anticipated)	tonnes/annum	7500
d	Average Return trip distrance for Ash utilization or disposal	km	30
e	Average load per truck	tonnes	8
f	Total Distance travelled	km	1059375
g	Consumption of Diesel by truck	km/Litre	5
h	Total Diesel consumption for transportation	Litres	211875
i	Density of Diesel	kg/Litre	0.82
j	Total Diesel consumption	kg	173738
k	Energy value of Diesel (IPCC)	TJ/10^3 tonnes	43.33
l	Total Energy from Diesel	TJ	7.53
m	Emission factor of Diesel	t CO_2/TJ	74.1
n	Total Transport Emissions	t CO_2	**558**

* AVD considered is the maximum possible distance from plant site (Radious 50, 60+60 = 120 km)

** Ash Generation is considered at 10% of total biomass consumption per year for projection

Since, the emissions due to transportation of coal has not considered while calculating the baseline emission factor of southern regional grid, the project proponent ignored the same in project scenario, which are negligible.

The project activity is generating electricity using Biomass residues such as rice husk and other crop residues or wastes; hence, according to the Attachment C to Appendix B of simplified modalities and procedures, the leakage source applicable is 'Competing use of biomass'. The project proponents conducted a Biomass Assessment Survey in the project region to ensure that the biomass available in the region is surplus, which is not utilized so far. According to the Biomass Assessment Report, the total generation of biomass residues with in the 50 km radius from plant location is 1.63 million tonnes (mt), where as the consumption of the region is 0.47 mt. The surplus biomass available is 1.16 mt. The leakage calculation is demonstrated in the below table:

Leakage - Competing use of Biomass

	Parameter	Unit	Value
a	Total biomass available in the region (with in the in 50 Km radius)	t/y	16.31
b	Total conumption of the reigon	t/y	4.73
c	Biomass requirement of the project activities in the region (2 X 6 MW)	t/y	1.5
d	Total biomass consumption of the region including project activity (b+c)	t/y	6.23
e	Total surplus in the region after accounting for all types of consumption (a-d)	t/y	10.08
h	Percentage of surplus available biomass in the reigon (g/d%)	%	**162%**

The total quantity of surplus biomass in the region is 162% larger than the total biomass consumption in the region. Hence, the leakage emissions due to competing use of biomass is neglected.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

>>

The sum of E1.2.1 and E 1.2.2 is furnished in the following table.

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-06
Project emissions, **E.1.2.1**, tCO_2	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186
Leakage, **E.1.2.2**, tCO_2	0	0	0	0	0	0	0	0	0	0
Total, **E.1.2.1 + E.1.2.2,** tCO_2	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

>>

As explained in Section B.2 above, the baseline for the project activity is kWh produced by the biomass project multiplied by an emission co-efficient calculated in a transparent and conservative manner as the weighted average emissions (in tCO_2/kWh) of the current generation mix.

For the proposed project activity the Emission factor values published by the Central Electricity Authority for the Southern region is considered as the project is located in southern region.

i : Estimation of baseline or Emission Coefficient

Baseline emission factor is estimated as the weighted average of all existing generation sources using the following formula.

Baseline Emission factor	=	Baseline emissions	/	Total net energy in the system
tCO_2/GWh		tCO_2	/	GWh

The Baseline Emission factor is taken from CEA published values on Indian grid system for each regional grid. The emission factor published for the year 2004-05 for southern grid is 780 tCO_2/GWh. The emission factor value is applied for exante calculation of emission reductions. However, will be updated expost.

iv : Estimation of baseline emissions

Baseline emissions or emissions avoided by the project activity are estimated using the following formula.

Baseline Emissions or avoided emissions tCO_2	=	Emission co-efficient (From iii: above) tCO_2/GWh	x	Net power export from the project GWh

The power export from the project is anticipated at 45.19 GWh per year, based on which the baseline emissions are estimated and tabulated as below.

Baseline Emissions (tCO_2)

S.no	year	Gross Generation	Enrgy export	Emission Factor	Baseline Emissions
		GWh	GWh	tCO_2/GWh	tCO_2
1	2007	50.49	45.19	780	35247
2	2008	50.49	45.19	780	35247
3	2009	50.49	45.19	780	35247
4	2010	50.49	45.19	780	35247
5	2011	50.49	45.19	780	35247
6	2012	50.49	45.19	780	35247
7	2013	50.49	45.19	780	35247
8	2014	50.49	45.19	780	35247
9	2015	50.49	45.19	780	35247
10	2016	50.49	45.19	780	35247
Total Baseline Emissions					**352470**

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

>>

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-06
Baseline emissions, **E.1.2.4**, tCO_2	34,247	34,247	34,247	34,247	34,247	34,247	34,247	34,247	34,247	34,247
Project emissions, **E.1.2.3**, tCO_2	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186	11,186
Emissions Reductions, **E.1.2.4 – E.1.2.3,** tCO_2	24,061	24,061	24,061	24,061	24,061	24,061	24,061	24,061	24,061	24,061

E.2 Table providing values obtained when applying formulae above:

>>

S. No	Year	Annual estimation of emission reductions in tonnes of CO2 eq.
1	2007-08	24,061
2	2008-09	24,061
3	2009-10	24,061

4	2010-11	24,061
5	2011-12	24,061
6	2012-13	24,061
7	2013-14	24,061
8	2014-15	24,061
9	2015-16	24,061
10	2016-17	24,061
Total estimated reductions (tonnes of CO_2 eq.)		**240,610**
Total number of crediting years		**10**
Annual average over the crediting period of estimated reductions (tonnes of CO_2eq.)		**24,061**

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>

As per the prevailing regulations of the Host Party i.e. India (represented by the Ministry of Environment and Forests, Govt. of India and also the line ministry for environmental issues in India), the project activity need not conduct environmental impact assessment. However, before implementation of the project, project participants have to obtain clearance from local Pollution Control Board. As required for implementation of the project activity, project participants had studied the possibility of environmental impacts and concluded that no negative impacts are possible due to the project activity. Having satisfied with the project design, local pollution control board represented by the Karnataka State Pollution Control Board (KPCB) has accorded its consent for implementation and operation of the project.

The project does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. However the design philosophy of this biomass based project activity is driven by the concept of providing the low cost energy with carbon neutral fuel. Therefore the project will have no impact on the environment.

SECTION G. Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

>>

No specific public consultation / participation requirements are specified in Indian statutes for setting up of small-scale industries. However, there are certain procedural requirements, which every project investor needs to follow before implementing any project.

Before implementing any project, project investors / developers need to identify the stakeholders, prepare necessary documents, approach the identified stakeholders directly and obtain required clearances / approvals. The stakeholders after review of documents and investment profile, will accord approvals / licences or send comments in writing to project investors for further clarifications / corrections. In case they are not satisfied with the project design or they feel that the project impacts any of the local environment / social / economical environments, they will not issue clearances / approvals and stop the implementation of the project.

Identification of the Stakeholders:

The project participants identified the following stakeholders for the project activity.

Stakeholder Name	Function of Stakeholder	Description of Involvement
KREDL	Policy implementation body in respect of renewable energy projects in Karnataka. KREDL reviews the project documentation and accords clearance for utilizing renewable energy sources in the state	Issues clearance for setting up the project in Karnataka utilizing biomass potential available nearer to the project site.
KPTCL	The state owned electricity utility company that manages the electricity transmission and distribution in Karnataka state. Any electricity generation project proposed in Karnataka shall approach KPTCL for power evacuation arrangements. Both KPTCL and the project proponent shall sign a Power Purchase Agreement, before implementing the project.	Purchase power from the project proponent by executing Power Purchase Agreement to determine the tariff and other terms.
KSPCB	A statutory local body that oversees the pollution control aspects in the state. Any project activity shall obtain clearance from the KSPCB before implementation.	Issues clearance for setting up of the project
Local Village Panchayat	Elected statutory body of the local populace	Accords permission for setting up of the project under the jurisdiction of the village

Stakeholders Involvement:

The project participants prepared necessary documentation before implementation of the project activity and approached the above stakeholders individually. The project participants have received no negative comments, which is evident from the following clearances and approvals.

Department of Energy
The Department of Energy, Govt. of Karnataka has issued clearance for setting up of the project vide **DE/176/NCE/2000** dated 7th September 2001.

KREDL
Karnataka Renewable Energy Development Limited (KREDL) has issued clearance for the project.

Environment & Forest Dept.
The project has got clearance from Department of Forest, Environment and Biology, Govt. of Karnataka vide **FEB/148/ECO/2004** dated 23rd August 2004.

Pollution Control Board
The Karnataka State Pollution Control Board (KSPCB) has issued 'Consent for Operation' to the project vide **KSPCB/APC/DEO-TC/AEO-2/2005-06/403** dated 1st March 2005.

KPTCL
The project has got approval for power evacuations from Karnataka Power Transmission Corporation Limited (KPTCL) vide **CEE (P&C)/SEE(PLG)/EE (PSS)/F-117/CYS-80** dated 26th June 2003.

Inspector of Factories & Boilers
The project has obtained clearance from Inspector of Factories & Boilers vide **No: 4/10830** on 15th October 2005

PPA
The project has entered into Power Purchase Agreement with KPTCL on 10th June 2002.

Stakeholders comments:

All stakeholders have already issued their approvals/consents/licenses for setting up and commissioning of the project activity and no comments were received on the project, which is evident from the fact that the power plant is in operation for over a year.

G.2. Summary of the comments received:

>>
No negative comments are received on the project activity, which is evident from the licences / approvals / clearances accorded to the project activity by the stakeholders.

G.3. Report on how due account was taken of any comments received:

>>
No comments received; hence no report is applicable.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Ravikiran Power Projects {P} Limited
Street/P.O.Box, Building:	Plot No: 1071, Road No: 44, Jubilee Hills,
City:	Hyderabad
State/Region:	Andhra Pradesh
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Country:	India
Telephone:	+91- 40- 3291 5858 / 3294 6868
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E-Mail:	mahesh@greenkogroup.com
URL:	
Represented by:	
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Salutation:	Mr.
Last Name:	Kolli
Middle Name:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding from the parties included in Annex - I is involved in the project activity

Annex 3

Generation data published by CEA

GENERATION DATA

Gross Generation Total (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	144,292	151,185	155,385	165,735	168,438
East	58,936	64,048	66,257	75,374	85,776
South	128,983	131,902	136,916	138,299	144,086
West	162,329	165,805	177,399	172,682	183,955
North-East	5,314	5,292	5,811	5,880	7,904
India	499,854	518,231	541,766	557,970	590,158

Net Generation Total (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	135,230	141,415	144,741	155,043	157,290
East	53,350	58,097	59,841	68,428	77,968
South	121,144	123,612	127,780	128,165	134,691
West	150,412	153,125	164,448	159,780	170,726
North-East	5,185	5,169	5,669	5,758	7,776
India	465,321	481,417	502,480	517,174	548,451

20% of Net Generation (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	27,046	28,283	28,948	31,009	31,458
East	10,670	11,619	11,968	13,686	15,594
South	24,229	24,722	25,556	25,633	26,938
West	30,082	30,625	32,890	31,956	34,145
North-East	1,037	1,034	1,134	1,152	1,555
India	93,064	96,283	100,496	103,435	109,690

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	25.9%	25.7%	26.1%	28.1%	26.8%
East	10.8%	13.4%	7.5%	10.3%	10.5%
South	28.1%	25.5%	18.3%	16.2%	21.6%
West	8.2%	8.5%	8.2%	9.1%	8.8%
North-East	42.3%	42.1%	45.8%	41.8%	55.4%
India	19.2%	18.9%	16.3%	17.1%	18.0%

Net Generation in Operating Margin (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	100,189	105,076	106,940	111,449	115,151
East	47,570	50,308	55,377	61,378	69,746
South	87,100	92,085	104,441	107,396	105,584
West	138,071	140,173	150,889	145,264	155,731
North-East	2,992	2,995	3,071	3,350	3,469
India	375,923	390,638	420,718	428,838	449,681

Emission data published by CEA

EMISSION DATA

Absolute Emissions Total (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	97,863,848	102,743,113	106,777,065	109,980,786	112,199,697
East	58,025,890	61,436,757	66,595,529	75,515,998	83,956,860
South	88,017,676	91,784,223	103,446,194	107,552,285	105,109,971
West	135,042,877	141,495,889	148,207,853	144,019,674	157,664,483
North-East	2,009,681	1,976,535	2,090,087	2,088,985	2,294,430
India	380,959,970	399,436,516	427,116,728	439,157,728	461,225,442

Absolute Emissions OM (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	97,863,848	102,743,113	106,777,065	109,980,786	112,199,697
East	58,025,890	61,436,757	66,595,529	75,515,998	83,956,860
South	88,017,676	91,784,223	103,446,194	107,552,285	105,109,971
West	135,042,877	141,495,889	148,207,853	144,019,674	157,664,483
North-East	2,009,681	1,976,535	2,090,087	2,088,985	2,294,430
India	380,959,970	399,436,516	427,116,728	439,157,728	461,225,442

Absolute Emissions BM (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North					17,108,583
East					14,303,611
South					19,330,781
West					26,784,935
North-East					206,514
India					77,734,425

Emission factors (for each region) published by CEA

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE

VERSION	**1.0**
DATE	**27 Nov 2006**
BASELINE METHODOLOGY	**ACM0002 / Ver 06**

EMISSION FACTORS

Weighted Average Emission Rate (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.72	0.73	0.74	0.71	0.71
East	1.09	1.06	1.11	1.10	1.08
South	0.73	0.74	0.81	0.84	0.780
West	0.90	0.92	0.90	0.90	0.92
North-East	0.39	0.38	0.37	0.36	0.30
India	0.82	0.83	0.85	0.85	0.84

Simple Operating Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.98	0.98	1.00	0.99	0.97
East	1.22	1.22	1.20	1.23	1.20
South	1.01	1.00	0.99	1.00	1.00
West	0.98	1.01	0.98	0.99	1.01
North-East	0.67	0.66	0.68	0.62	0.66
India	1.01	1.02	1.02	1.02	1.03

Build Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North					0.53
East					0.90
South					0.71
West					0.77
North-East					0.10
India					0.70

Combined Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.76	0.76	0.77	0.76	0.75
East	1.06	1.06	1.05	1.07	1.05
South	0.86	0.85	0.85	0.86	0.85
West	0.88	0.89	0.88	0.88	0.89
North-East	0.39	0.38	0.39	0.36	0.38
India	0.85	0.86	0.86	0.86	0.86

Annex 4

Abbreviations

CEA	Central Electricity Authority
CFE	Consent for Establishment
CFO	Consent for Operation
CO_2	Carbon dioxide
EIA	Environment Impact Assessment
GHG	Greenhouse gas
GWh	Giga watt hour
IPCC	Inter Governmental Panel on Climate Change
kcal	Kilo Calories
KPTCL	Karnataka Power Transmission Corporation Limited
KREDL	Karnataka Renewable Energy Development Limited
KSPCB	Karnataka State Pollution Control Board
kWh	Kilo watt hour
MW	Mega watt
MNES	Ministry of Non Conventional Energy Sources
MoEF	Ministry of Environment & Forest
MT	Metric Tonne
NCV	Net Calorific Value
PDD	Project Design Document
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change

Attachment – 1

Government of Karnataka

176 NOV 2000

Karnataka Government Secretariat
Multistoreyed Building,
Bangalore-1, dated 7 -9 -2001

M/s. Ravikiran Power Projects (P) Limited,
No.1183/8-3-430/1/23, St.No.10,
Yellareddyguda,
Hyderabad - 500073.

Sir,

Sub : According in principle clearances for setting up Biomass Power Generation Plant by M/s.Ravikiran Power Projects(P) Limited at Marlnahalli village, Gangavati Taluk, Koppal District - reg.

Ref : Letter No.KREDD/03/BDPPL/00/1176 Dtd.9.11.2000 received from the Managing Director, KREDL, Bangalore.

With reference to the subject and recommendation of the Managing Director, Karnataka Renewable Energy Development Limited, Bangalore cited under reference above, I am directed to state that the Government are pleased to convey the Objection for setting up of 6 MW Biomass based power plant to M/s. Ravikiran Power Projects Private Limited at Marlanahalli Village, Gangavati Taluk, Koppal District, subject to the following conditions.

1. The Company shall obtain seperate clearances from Karnataka Power Transmission Corporation Limited, in respect of evacuation of power.

2. The company shall enter into a Wheeling and Banking Agreement with Karnataka Power Transmission Corporation Limited in case of selling power to Third party and PPA in case of selling power to KPTCL.

3. The Company shall obtain necessary statutary clearances wherever required from the respective Department/Organisation such as Forest Department, Revenue Department, Karnataka State Pollution Control Board for the Power Plant.

Attachment – 2

State Bank Of Indore
4-1-971/974, Triveni Complex
Abids Road, Hyderabad

Telefax : 040- 24754603
Tel : 040 - 24754898
e-mail- sbn3233@sbindore.co.in
Website : www.indorebank.org

12.04.2006

To
M/s.Ravikiran Power Projects(P) Ltd.,
Hyderabad.

Dear Sirs,

RE: SANCTION OF CREDIT FACILITIES: REVISED TERMS AND CONDITIONS

With reference to above, we have to inform you that the following credit facilities have been sanctioned to you, at your request, on the revised terms and conditions and shall be made available to you after execution of the required documents & on compliance of all the terms & conditions of sanction as mentioned below:

	Term Loan	Existing	Revised
1	Limit	Rs.1000.00 lac	**After repayment of 1 quarterly installment, the balance outstanding in the Term Loan is Rs.973.55 lac. Accordingly, the limit is reduced to Rs.973.55 lac.**
2	Interest	1.75% p.a above BPLR i.e.,10.75% p.a., effectively 12.50% p.a with monthly rests	1.25% p.a above BPLR i.e.,10.75% p.a., effectively 12.00% p.a with monthly rests
3	Repayment	Repayment to be made in 32 qtly instalments, with a moratorium of 2 years. (Repayment in 1st year Rs.105.77 lacs, 2nd year Rs.132.21 lacs, 3rd year Rs.137.02 lacs, 4th year onwards Rs.125.00 lacs)	See table below
			All other existing terms and conditions as advised to you earlier, shall remain unchanged.

Date	Amt. (Rs. in lacs)	Date	Amt. (Rs. in lacs)	Date	Amt. (Rs. in lacs)
3-Jan-07	26.45	3-Oct-09	31.25	3-Jul-12	31.25
3-Apr-07	26.45	3-Jan-10	31.25	3-Oct-12	31.25
3-Jul-07	26.45	3-Apr-10	31.25	3-Jan-13	31.25
3-Oct-07	33.05	3-Jul-10	31.25	3-Apr-13	31.25
3-Jan-08	33.05	3-Oct-10	31.25	3-Jul-13	31.25
3-Apr-08	33.05	3-Jan-11	31.25	3-Oct-13	31.25
3-Jul-08	33.05	3-Apr-11	31.25	3-Jan-14	31.25
3-Oct-08	34.25	3-Jul-11	31.25	3-Apr-14	31.25
3-Jan-09	34.25	3-Oct-11	31.25	3-Jul-14	31.25
3-Apr-09	34.25	3-Jan-12	31.25	TOTAL	973.55
3-Jul-09	34.25	3-Apr-12	31.25		

Interest to be paid as and when applied in the account.

In token of having accepted the above terms & conditions, please arrange to get the duplicate of this letter and the special covenants enclosed herewith signed by all the Guarantors & the

MD for Ravi Kiran Power Projects Pvt. Ltd.,
Managing Director

B A N G A L O R E

आवास तथा नगर विकास निगम लि., 'मणिपाल सेन्टर', सातवी मंजिल, युनिट 703 & 704, नार्थ ब्लाक, सख्या 47, डिकनसन रोड, बैंगलोर - 560 04
दूरभाष : EPABX : 5550482, 5587019, 5587010, 5587012, 5587014 फैक्स : 91-80-5598748 ई-मेल : hudcobro@vsnl.net

Housing and Urban Development Corporation Ltd., 'Manipal Centre', 7th Floor, Unit 703 & 704, North Block, No. 47, Dickenson Road, Bangalore-560 04
Tel : EPABX : 5550482, 5587019, 5587010, 5587012, 5587014 Fax : 91-80-5598748 E-mail : hudcobro@vsnl.net
(A Govt. of India Enterprise) (भारत सरकार का उपक्रम)

(LAW/43/1995)
(Modified as of 12-9-2002)[h1]

Letter of offer

(For Private Builders)

No. HUDCO/BRO/KAR/PB/RPPPL/2003-04/18019/2003/3885 24-6-2003

The Managing Director,
M/s. Ravi Kiran Power Projects (Private) Limited,
#494/A (Part), Road No. 22,
Jubilee Hills,
HYDERABAD – 500 033.

Dear Sir,

Ref:- Your loan application for Rs. 1080.00 lakhs for Setting Up of 7.5 MW Biomass Based Power Project at Gangawati, Koppal District, Karnataka (Scheme No. 18019) (A-2549).

Please refer to the loan application submitted by your Company for Setting Up of 7.5 MW Biomass Based Power Project at Gangawati, Koppal District for Rs. 1080.00 lakhs only. Your application has been processed and we are pleased to approve the project finance of Rs. 1080.00 lakhs for Setting Up of 7.5 MW Biomass Based Power Project at Gangawati, Koppal District subject to the terms and conditions stated below:-

1. PROJECT:-

Setting Up of 7.5 MW Biomass Based Power Project at Gangawati, Koppal District.

2. LOAN AMOUNT:

Rs.1080.00 Lakhs (Rupees One Thousand Eighty Lakhs only). The above sum of Rs. 1080.00 lakhs is sanctioned to your company as project finance.

hudco

1

3. SECURITY:

1. Pari-passu charge along with State Bank of Indore on all the properties of the company.
2. Mortgage of 9.17 acres of land and all the buildings to be constructed (present & future) in the project land.
3. Hypothecation of all movable and immovable assets including all equipments, plant and machinery of the project.
4. To furnish 25% of loan amount as collateral security to be accepted as per HUDCO norms.
5. Personal Guarantees of the Promoter-Directors.
6. Post Dated Cheques for the entire repayment period of HUDCO loan along with interest.
7. Operation of Escrow Account as per HUDCO norms.
8. Assignment of all contractual rights, insurance policies etc.,

4. (i) RATE OF INTEREST:

Interest will be charged @ **12.50%** per annum or any other rate as per the prevailing current financing pattern of HUDCO. HUDCO shall have the right to increase the rate of interest on un-disbursed portion of loan subject to the conditions which may be imposed by HUDCO.

(ii) RIGHT TO RESET THE INTEREST RATE:-

Interest rates shall be reset at the rates as per prevailing financing pattern along with payment of one time reset charges @1% on the principal outstanding loan amount. Further, HUDCO shall also have the right to vary any of the conditions contained herein at the time of resetting of the interest rate. The Borrower will have the option to reset the interest rate once during the total repayment period for the scheme.

(iii) INTEREST TO BE PAID QUARTERLY:-

The interest shall be payable quarterly on or before 31st day of March, 30th day of June, 30th day of September and 31st day of December each year. The first payment of interest for a proportionate period, if any, shall be due and payable on the due date immediately following after the date of first disbursement against the loan.

Attachment – 3

Annexure: IV

POWER PURCHASE AGREEMENT

BETWEEN

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

AND

RAVIKIRAN POWER PROJECTS PRIVATE LIMITED

DATED: 10/06/2002

THIS POWER PURCHASE AGREEMENT is made and entered into at Bangalore this Tenth day of June Two thousand two between KARNATAKA POWER TRANSMISSION CORPORATION LIMITED, incorporated in India under the Companies Act, 1956 and having its registered office located at Kaveri Bhavan, Bangalore, State of Karnataka (hereinafter referred to as the "Corporation" which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) as party of the first part, and RAVIKIRAN POWER PROJECTS PRIVATE LIMITED, a company formed and incorporated under the Companies Act, 1956, and a "Generating Company" under section 2(4-A) of the Electricity (Supply) Act, 1948 having its registered office at 494/A, (Part), Road No. 22, Jubilee Hills Hyderabad – 500 033, Andhra Pradesh, India hereinafter referred to as the "Company" (which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) as party on the second part.

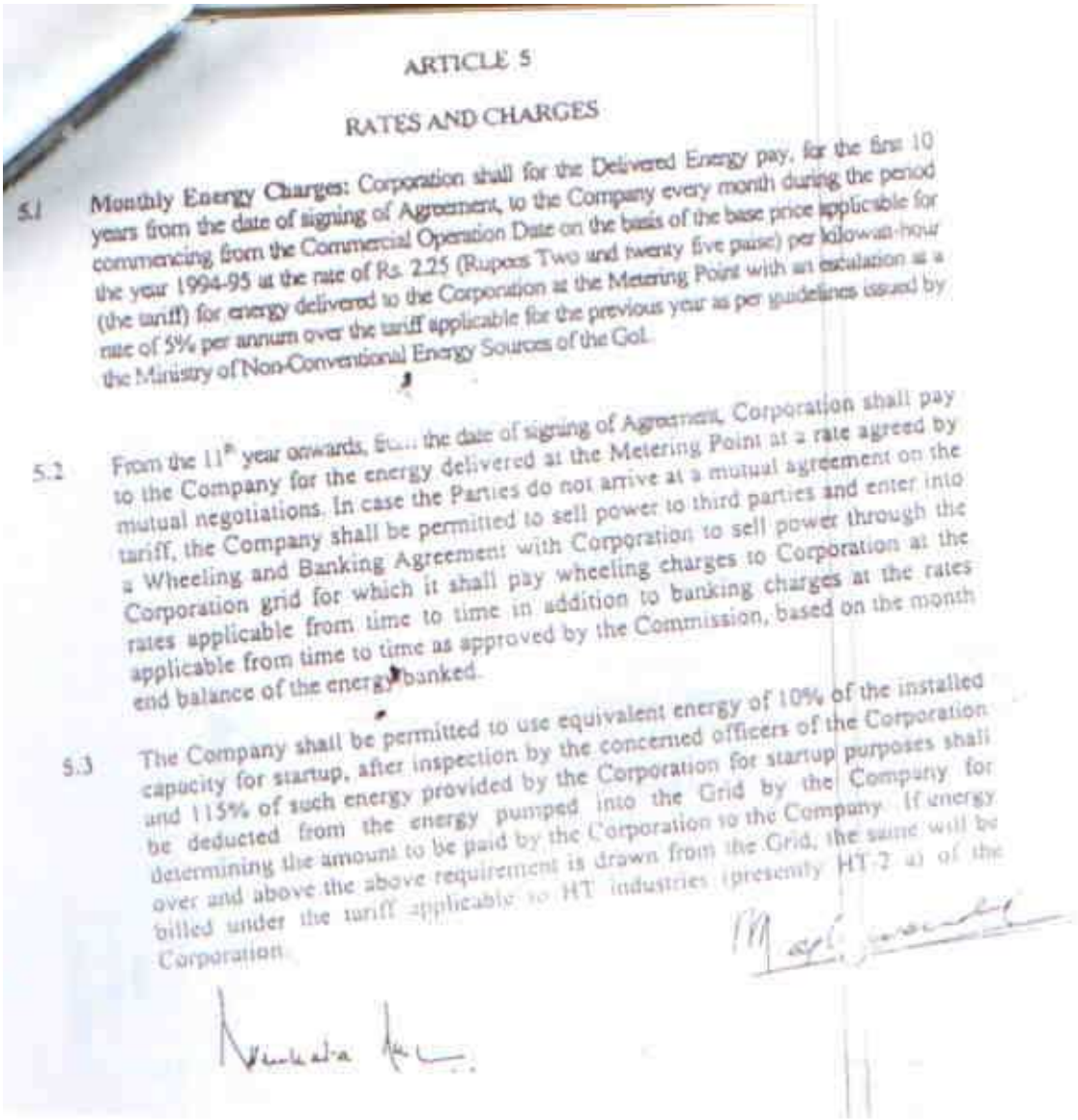
WHEREAS:

i) The Govt. of Karnataka by its No. DE 176 NCE 2000, Bangalore dated 07.09.2001, has conveyed 'No Objection' to the proposal of the Company for setting up 6 MW capacity Biomass based Power Generating Station near Marlanahalli Village, Gangavati Taluk, Koppal District in Karnataka and permitted Corporation to enter into an agreement with the Company for purchase of Electricity.

ii) Pursuant to (i) the Company plans to develop, design, engineer, procure finance, construct, own, operate and maintain a Biomass based Power Generating Station, (hereinafter defined as the Project), with a Gross capacity of 6 MW near Marlanahalli Village, Gangavati Taluk, Koppal District and desires to sell Exportable Capacity (as hereinafter defined) to Corporation, and Corporation has agreed to purchase the Exportable Capacity from the company.

iii) Corporation is engaged in the purchase, transmission, distribution and supply of electricity has agreed to purchase the Electricity (as hereinafter defined) from the company to be generated near Marlanahalli Village, Gangavati Taluk, Koppal District on the conditions setforth herein.

NOW THEREFORE IN VIEW OF THE FOREGOING PREMISES AND IN CONSIDERATION OF THE MUTUAL COVENANTS AND CONDITIONS HEREINAFTER SET FORTH, CORPORATION AND THE COMPANY, EACH TOGETHER WITH THEIR RESPECTIVE SUCCESSORS AND PERMITTED ASSIGNS, A PARTY AND COLLECTIVELY THE PARTIES, HEREBY AGREE AS FOLLOWS



ARTICLE 5

RATES AND CHARGES

5.1 **Monthly Energy Charges:** Corporation shall for the Delivered Energy pay, for the first 10 years from the date of signing of Agreement, to the Company every month during the period commencing from the Commercial Operation Date on the basis of the base price applicable for the year 1994-95 at the rate of Rs. 2.25 (Rupees Two and twenty five paise) per kilowatt-hour (the tariff) for energy delivered to the Corporation at the Metering Point with an escalation at a rate of 5% per annum over the tariff applicable for the previous year as per guidelines issued by the Ministry of Non-Conventional Energy Sources of the GoI.

5.2 From the 11th year onwards, from the date of signing of Agreement, Corporation shall pay to the Company for the energy delivered at the Metering Point at a rate agreed by mutual negotiations. In case the Parties do not arrive at a mutual agreement on the tariff, the Company shall be permitted to sell power to third parties and enter into a Wheeling and Banking Agreement with Corporation to sell power through the Corporation grid for which it shall pay wheeling charges to Corporation at the rates applicable from time to time in addition to banking charges at the rates applicable from time to time as approved by the Commission, based on the month end balance of the energy banked.

5.3 The Company shall be permitted to use equivalent energy of 10% of the installed capacity for startup, after inspection by the concerned officers of the Corporation and 115% of such energy provided by the Corporation for startup purposes shall be deducted from the energy pumped into the Grid by the Company for determining the amount to be paid by the Corporation to the Company. If energy over and above the above requirement is drawn from the Grid, the same will be billed under the tariff applicable to HT industries (presently HT-2 a) of the Corporation.

Attachment – 4

KARNATAKA POWER TRANSMISSION CORPORATION LTD.

Phone : 080-2215187
Fax : 080-2284023
Email pmg_kptcl@sify.com

Corporate Office
4th Floor, A Block
Kaveri Bhavan
Bangalore - 560 009.

No. KPTCL/BOS/SEE (P&M)/AEEE4/ 4495-05 Dated: 25.6.2003

The Managing Director
M/s. Ravi Kiran Power Projects Pvt. Ltd.,
No. 494/4 (Part), Road No. 22,
Jubilee Hills,
Hyderabad - 500 033.

Sir,

Sub: Termination of Power Purchase Agreement.

This is to inform that the Power Purchase Agreement entered into with your company on 10.06.2002 in respect of purchase of power from your proposed 6 MW capacity Biomass based Power project at Marlanahalli Village, Gangavathi Taluk, Koppal District, has been terminated with immediate effect.

In case you intend to continue to develop the project and sell power to KPTCL, you are requested to enter into a fresh agreement as per the following tariff, terms and conditions approved by KPTCL by submitting necessary relevant documents.

A. Tariff: Rs. 2.80 per Kwhr., with an annual escalation of 2% on base tariff of Rs. 2.80 per Kwhr.

B. Terms and Conditions:

1. The tariff proposed above will be applicable for the next 10 years and after which the tariff for purchase of power from Biomass projects will be based only on operating cost and some incentives.
2. Financial Closure shall be achieved within three (3) months of signing of Power Purchase Agreement.
3. Construction work should commence at site within three (3) months of date of achievement of Financial Closure.
4. In case of failure to achieve Financial Closure / commence construction work within the time allotted, the Power Purchase Agreement shall automatically become null & void.

Biomass/Termination

5. Benefits accruing on account of Carbon credits shall be shared between KPTCL and the Company in the ratio of 70:30.

6. The Power factor at which the project is operated shall be at the same level as that of KPTCL grid failing which compensation at the rate of Rs. 0.40 per KVARH shall be charged.

7. In case any of the developers desire to wheel the electricity generated by them to the third party they will be permitted to do so as per the provisions of the Tariff Order issued by KERC.

Receipt of this letter may please be acknowledged.

Yours faithfully,

20/2/03

General Manager (Technical)
KPTCL, Kaveri Bhavan, Bangalore.

Copy for information and needful to:-
1. The Chief Engineer, Electy., Planning & Co-ordination, KPTCL, Bangalore.
2. The Chief Engineer, Electy., Transmission Zone, KPTCL, Gulbarga.
3. The Chief Engineer, Electy., Load Despatch Centre, KPTCL, Bangalore.
4. The Chief Engineer, Electy., Regulatory Affairs, KPTCL, Bangalore.
5. The Financial Advisor (A&F), KPTCL, Bangalore.
6. The Superintending Engineer, Elecl., Works & Maintenance Circle, KPTCL, Munirabad.
7. The Superintending Engineer, Elecl., RT Circle, KPTCL, Bangalore.
8. The Superintending Engineer, Elecl., P&M, KPTCL, Bangalore.
9. The Executive Engineer, Elecl., O&M Division, GESOM, Koppal
10 The Executive Engineer, Elecl., RT Division, KPTCL, Bellary.

Attachment – 5

SUPPLEMENTAL AGREEMENT

THIS DRAFT **SUPPLEMENTAL AGREEMENT** modifying the PPA dated 10-06-2002 is made at Bangalore this 24th day of November Two thousand and Five between **GULBARGA ELECTRICITY SUPPLY COMPANY LIMITED,** a company formed and incorporated in India under the Companies Act, 1956 with its registered office located at Station Main Road, Gulbarga, GESCOM, Karnataka State, hereinafter referred to as the **"GESCOM"** represented by the Managing Director (which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) as party of the first part,

AND

M/s. Ravikiran Power Project Private Limited, a company formed and incorporated under the Companies Act, 1956 having its registered office at Plot No. 494/A(Part), Road No.22,Jubilee Hills,Hyderabad – 500 033,Andhra Pradesh India hereinafter referred to as the **"Company"** represented by the Managing Director (which expression shall, unless repugnant to the context or meaning thereof, include its successors, and permitted assigns) as party of the second part, each a Party and together the Parties.

WHEREAS

(i) The Government of Karnataka permitted M/s. **Ravikiran Power Project Private Limited** to set up a Bio mass power project with a gross capacity of 6MW and Exportable capacity up to 6MW at Marlanahalli Village, Gangavathi Taluk, Koppal District in Karnataka vide G.O No: DE 176 NCE 2000 dated 07-09-2001.

(ii) Persuant to the above a Power Purchase Agreement dated 10-06-2002 ("The Agreement") was entered into between Karnataka Power Transmission Corporation Limited and the Company for sale and purchase of Electricity, Generated by their 6MW capacity Biomass based electric power Generating station (the project).

(iii) The Power Purchase Agreement dated 10-06-2002 was terminated by KPTCLduring 2003, for the reasons stated therein.

(iv) The Company disputed the validity of the termination of the Agreement by KPTCL filing the writ petition No. 11266/2004 before Hon'ble High Court of Karnataka and the Hon'ble High Court of Karnataka vide its order dated 12-04-2004 has stayed the termination order issued by the Corporation, pending Writ Petition.

(v) The Government of Karnataka vide its Order No.EE 253 NCE 2002, dated 28-09-2002 accorded sanction to the company for enhancement of their Biomass power plant Capacity from 6.0MW to 7.5MW.

(vi) The Company has obtained the revised evacuation approval for evacuating the enhanced Capacity of 7.5MW from their Biomass power plant vide

For Ravi Kiran Power Projects Pvt. Ltd.,

Managing Director.

Director (Procurement)
KPCC, GOK, Bangalore

letter no. CEE (P&C)/SEE(PLG)/EE(PSS)/F-117/cys-80 dated 26-06-2003 of Chief Engineer Electy.(P&C).

(vii) During the pendency of the Writ Petition it has been agreed to reinstate the terminated contract subject to the condition that the company agrees to sell electricity at the rate of Rs. 3.10/unit for proportionate energy exported corresponding to the earlier capacity of 6.0 MW and at the rate of Rs. 2.85/unit for balance energy over and above 6.0MW andup to 7.5 MW (Presently agreed Capacity) and with escalation at 2% per annum is payable.

(viii) M/s. Ravikiran Power Project Private Limited has accepted the above and based on the same they have commissioned the project as enhanced on 01.06.2005.

(vi) As per Electricity Act 2003 KPTCL is barred from trading electricity with effect from 10-06-2005. Hence the PPA dated 10-06-2002 in respect of M/s. Ravikiran Power Project Private Limited was assigned to GESCOM by GOK vide its order dated 31-08-2005. For the enhanced capacity the supplemental Agreement with the Tariff as mutually accepted need to be executed between the parties.

(vii) Negotiations have been held between the Parties and they have arrived at a mutually acceptable settlement.

NOW THEREFORE, in view of the foregoing premises and in consideration of the mutual covenants and conditions hereinafter set forth, the Parties hereby agree to amend/modify the Agreement dated 10-06-2002 as follows;

1) Parties agree that the Power Purchase Agreement dated 10-06-2002 shall stand revived subject to the following modifications and approval by the Karnataka Electricity Regulatory Commission.

1) Article 1: "Definitions"

The following definitions in the Power Purchase Agreement shall stand modified as follows

a) **"GESCOM"** means Gulbarga Electricity Supply Company or its successor Entity.

b) **"GESCOM's Electrical System"** means which includes the GESCOM's power distribution lines, Transformers, Circuit Breakers, CT's, PT's, relays, towers, structures and associated equipments involved in the transmission of Electrical energy.

c) **"Installed Capacity"** means the capacity of the Project at the generating terminal(s) and shall be equal to one unit of 7.5 MW

"Project" means a Biomass based/Agricultural Residue Based Power Station to be established by the Company in Koppal District, in the State of Karnataka

For Ravi Kiran Power Projects Pvt. Ltd.,

Managing Director.

Director (Procurement)
KPCC, GOK, Bangalore

comprising of a Unit with an Installed capacity of 7.5 MW and shall include land, buildings, plant, machinery, ancillary equipment, material, switch-gear, transformers, protection equipment and the like necessary to deliver the Electricity generated by the Project to the Corporation at the Delivery Point.

e) **"State Load Despatch Center"** means the State Load Despatch Center located at Bangalore. The definition of Corporation Load Despatch center as defined in The Agreement dated 10-06-2002, herein after be replaced with State Load Despatch Center.

2) **Article 5.1 and 5.2 shall stand replaced as follows.**

"Article 5: Rates and Charges

5.1. **Monthly Energy Charges:** GESCOM shall for the Delivered Energy pay, for the first 10 years with effect from 10-06-2002, (the date of signing of "The Agreement") to the Company for the period commencing from the Commercial Operation Date, every month at the rate of Rs. 3.10 (Rupees Three and Ten paise only) per kilowatt-hour (" base tariff") for the proportionate energy corresponding to the earlier capacity of 6.0 MW and at the rate of Rs. 2.85 (Rupees Two and Eighty Five Paise only)Per Kilowatt-hour ("base tariff") for the energy over and above the Capacity of 6.0MW and upto 7.5 MW(Presently agreed capacity), delivered to GESCOM at the Metering Point with a respective escalation at the rate of 2% per annum over respective "base tariffs" every year. This shall mean that the annual escalation will be at the rate of Rs.0.062 per Kwhr and Rs. 0.057 per Kwhr. respectively.
For the purpose of clarity, the following is the calculation of energy

$$\text{Energy to be billed at Rs.3.10/Kwhr in MU (Y)} = \frac{\text{Net energy exported to the grid X 6.0MW}}{\text{7.5 MW}}$$

Energy to be billed at Rs.2.85/unit in MU = (Net energy exported to the grid –Y)

5.2. From the 11th year onwards, from the date of signing of ("The Agreement"), GESCOM shall pay to the Company for the energy delivered at the Metering Point at a rate to be determined by the Commission. In case the GESCOM is unwilling to purchase the power at the rates determined by the Commission, the Company shall be permitted to sell energy to third parties and enter into a Wheeling and Banking Agreement with GESCOM/Corporation to sell power for which it shall pay transmission and other charges to GESCOM/ Corporation at the rates applicable from time to time.

5.4. The Company shall agree to pay to the GESCOM, on or before signing of this supplemental Agreement, at the rate of Rs. 37,000/- [Rupees Thirty Seven Thousand only] per MW of installed Capacity of 7.5 MW and for fractions thereof on a pro rata basis as a one time lump sum payment for the sole purpose of providing the required MVAR capacity at the sub-station of the KPTCL/GESCOM to which the Project is interconnected to supply the requisite reactive power to the "Grid system."KPTCL/GESCOM shall install the capacitors of required capacity at the substation of the Corporation/GESCOM to which the project is interconnected before Commercial Operation Date of the Project.

3) This Supplemental Agreement shall form and be construed as a Part of the Agreement dated 10-06-2002, and all other terms and conditions and clauses as

3

For Ravi Kiran Power Projects Pvt. Ltd.,

Managing Director.

Director (Procurement)
SPPCC, GOK, Bangalore

contained in the Agreement dated 10-06-2002, shall remain unaltered and enforceable and binding on the Parties.

IN WITNESS WHEREOF, the Parties hereto have caused this Supplemental Agreement to be executed by their fully authorized representatives, and copies delivered to each Party, as of the day and year first above stated.

FOR AND ON BEHALF OF GESCOM

(Sri. S. PRATAP KUMAR)
Director (Procurement), SPPCC, GOK.

Director (Procurement), SPPCC, GOK, Bangalore

WITNESSES

1. George K M
EEE SPPCC Bangalore.

2. (C. SUJATHA)
AEE SPPCC Bangalore

FOR AND ON BEHALF OF COMPANY
For Ravi Kiran Power Projects Pvt. Ltd.,
Venkata Rao
(Sri. R. VENKATARAO) Managing Director.

M/s. Ravikiran Power Project Pvt Limited

Ravikiran Power Projects Pvt. Ltd. Hyderabad

WITNESSES

1. (D. SRIMANNARAYANA)

2. (T. RAJSHEKAR)