**PROJECT DESIGN DOCUMENT FORM
FOR SMALL-SCALE CDM PROJECT ACTIVITIES (F-CDM-SSC-PDD)
Version 04.1**

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	**Biomass Power Project in Haveri District of Karnataka State, India**
Version number of the PDD	Version – 08
Completion date of the PDD	25/07/2013
Project participant(s)	Vasuki Power Private Limited
Host Party(ies)	India
Sectoral scope(s) and selected methodology(ies)	Type I – Renewable Energy Projects Category: I.D – Grid connected renewable electricity generation AMS-I.D, Version 17
Estimated amount of annual average GHG emission reductions	46,900

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The proposed CDM project activity is undertaken by Vasuki Power Private Limited in Haveri District of Karnataka, India. The project involves the installation of 10MW biomass based power plant to generate electricity and export power to the regional grid. The primary fuels envisaged for the power plant are Groundnut Shells, Rice husk, Chilly Stalk, Coconut shells & fronds, and Cotton stalks. The plant will require about 65,239 MT of Biomass fuels at 75% Plant Load Factor (PLF), which is available within a radius of about 25 to 50 kms from the proposed plant location.

The purpose of the project activity is to utilize the surplus biomass in the region effectively for the generation of power. The power produced would be evacuated through Karnataka Power Transmission Corporation Limited (KPTCL) 110kV grid at Savanur Substation in Haveri District and further supplied to Electricity Supply Company (ESCOM) forms the part of Southern Regional Grid of India. The substation is located approximately 2 kms away from the proposed plant location. The necessary transmission lines from the power plant to the substation would be laid by the project proponent as per the KPTCL norms.

The capacity of the proposed biomass power plant is fixed as 10 MW and will operate 24 hours a day for 340 days in a year. The direct combustion based technology is proposed to be adopted for Power Generation. An Atmospheric Fluidized Bed Combustion (AFBC) type boiler, using the above mentioned biomass as primary fuels are proposed for generating 45 TPH steam at 87 ata and 525^{O} C.

A 10 MW Bleed cum condensing type Turbo Generator (TG) set has been proposed for the plant, along with related accessories and auxiliary system. The net power available for sale to ESCOM is estimated at 556.92 lakh units per annum after taking into account the in-house auxiliary power consumption at 9% of total units generated. The plant load factor is considered as 75%.

The project activity shall reduce GHG emissions and contribute to sustainable development, through the generation of electricity from renewable biomass, which is carbon neutral. The proposed project will further help to reduce the ever-increasing demand and supply gap of electricity in the host country, India..

In addition to GHG emission reduction, the project activity would also contribute to the following local benefits during its operation:

- Economic utilization of surplus biomass through controlled combustion that otherwise adversely affects the health during burning in field or in house.
- Generation of additional income to the rural farmers that arises out of selling of these biomass residues.
- Generation of less carbon intensive electricity through renewable energy generation and thus reducing the demand for fossil fuel based power.
- Contribution to enhance the electricity generation capacity of host country.
- Providing employment for rural youth and other underprivileged persons in the process of collection, transportation and chipping of biomass residue.
- Contribution in helping through supply of stable power.

The view of the project participants on the contribution of the project activity to sustainable development

Vasuki Power Private Limited has envisaged that the project activity through the production of energy from biomass would contribute to sustainable development through the reduction of GHG emissions in the region. The sustainable development potential of the project activity is highlighted through the following indicators for sustainable development stipulated by Designated National Authority for CDM i.e. Ministry of Environment and Forests (MoEF), Government of India:

- Environmental well-being.
- Social well being.
- Economic well-being.
- Technological well-being.

Contribution to environmental well-being

- The proposed project activity utilizes surplus biomass available for power generation. The power thus generated shall be supplied to ESCOM which forms a part of the southern regional grid of India. The project activity will result in GHG emission reduction of 0.8421 tCO2e per MWh of electricity generated in the project plant.

- The uncontrolled burning of biomass in the absence of proposed project activity is prevented by use in power plant under controlled conditions, thus reducing the production of carbon monoxide and other harmful gases.

- In addition to the reduction in Carbon Dioxide emissions, the project implementation will result in reduction of other harmful gases (NOx and SOx) that arise from the combustion of fossil fuel used in conventional power generation.

- It also helps in avoiding the emission of methane gas (CH_4) which would have been produced by the anaerobic degradation of the biomass, in absence of the project activity.

- The project would conserve the non-renewable resources such as coal and petroleum for more important applications.

Contribution to social well being

- The project activity will result in direct and indirect employment opportunities for local persons towards installation, operation and maintenance of the proposed project activity.

- Collection, transportation and handling of biomass residue from fields will involve manpower requirement throughout the year; hence generate employment opportunities to the rural people. This will contribute towards improvement of the local economic structure and the social status of the people involved, clearly indicating positive socio-economic impact in the local area.

  The proposed project would engage both genders in construction of the project, biomass collection and handling etc. during the entire operational lifetime of the project.

Contribution to economic well being

- The project will bring an investment of approximately Rs. 495.30 Millions as a green field project in the under developed site of project location.

- Proposed project activity will act as a nucleus for other economic activities such as setting up of shops, hotels etc in and around the area contributing to the economic development around the project site. It will result in increased business opportunities for local contractors and suppliers during the various phases.

- The plant will generate commercial value to crop residues enabling the farmers to get better price out of their produce augmenting their income.

Contribution to technological well-being

- The success of this project activity would enable other investors to replicate this project.

- The project activity helps to improve the technical expertise of the local manpower in the operation and maintenance of similar projects.

- The above aspects would help in further development of biomass based projects in the state of Karnataka.

In view of the points discussed above, the project activity profoundly contributes to sustainable development criteria stipulated by Government of India, host country.

A.2. Location of project activity
A.2.1. Host Party(ies)
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India

A.2.2. Region/State/Province etc.
>>
Karnataka State

A.2.3. City/Town/Community etc.
>>
Chillura Village, Savanur Taluk, Haveri District

A.2.4. Physical/ Geographical location
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The project is located in Chillura Village, Savanur Taluk, Haveri District of Karnataka State, India with Latitude and Longitude of 15˚00´ 17”N / 15.0047 N and 75˚19´48” E / 75 .3300 E. The following map shows the exact location of project activity

A.3. Technologies and/or measures

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The proposed project activity is designed to generate electricity for the grid system by combustion of locally available renewable biomass residues. The basic technology is Rankine cycle route where direct combustion of biomass materials takes place in an Atmospheric Fluidized Bed Combustion (AFBC) type boiler to generate high pressure and high temperature steam, which drives a Bleed cum Condensing type turbo generator set.

The main plant and machinery consists of one Steam turbine generator set of 10 MW capacity. The steam requirement for the turbo generator set will be met through one Atmospheric Fluidized Bed Combustion (AFBC) type boiler of 45 Tons Per Hour (TPH) capacity. Apart from the Steam Generator Set and Boiler units, the power plant will consist of various auxiliary plants and systems like DM/RO water system, Cooling Water System, Compressed air system, Firefighting equipment, Fuel and Ash handling systems, Switch gear & Switch yard and Transmission lines for evacuating power to ESCOM at 110kV Savanur substation which is about 4km from the plant. Based on the power generation capacity of 10 MW, various equipments are sized in accordance with standard engineering practices.

The principal fuels used will be Groundnut Shells, Rice husk, Chilly Stalk, Coconut shells & fronds, Maize cobs and Cotton stalk. The selection of any particular fuel will be made based on its ease of availability and price economy at any given point of time. Considering rice husk as the major fuel with GCV of 3275 kCal/kg (Rice husk) and other biomass 2000 kCal/kg (cotton stalk) etc., the biomass requirement would vary from 10.00 to 10.30 Tons Per Hour. The fuel conveying system is designed for 45 TPH, keeping in mind the different fuels and their physical properties.

The detailed description of the plant is furnished in the tables below:

Technical Parameters of the Boiler:

Description	Parameters
Number of Boiler(s)	One
Type	Atmospheric Fluidized Bed Combustion type boiler
Boiler Capacity (100% load) / Steam Flow Rate	45 TPH
Steam Pressure at super heater outlet	87 ata
Steam Temperature at super heater outlet	525 ± 5 ˚
Feed Water Temperature at Economizer inlet	170 ˚C
Water Requirement	51 m3/hour
Lifetime	25 years[1]

Technical Parameters of the Steam Turbine:

Description	Parameter
Number of Turbine(s)	One
Type	Bleed cum Condensing Type Turbo Generator
Rated Capacity of Turbo Generator Set	10 MW
Auxiliary Consumption	0.9 MW
Net Power to Export	9.1 MW
Steam Flow at the inlet	45 TPH
Steam Pressure at the inlet of the Turbine	87 ata
Steam Temperature at the inlet of Turbine	525 ˚C

[1] Tool to determine the remaining lifetime of equipment, Version 1.0 Annex 15, EB 50.

Exhaust Pressure	0.10 ata
Generator Parameters	11.0 kV 3 Phase 50 Hz
Lifetime	25[2]

The technology to be employed is domestically available in India and the main equipments, i.e. boiler and turbine would be supplied by well known Indian manufacturers. All equipments are designed as per industry standards and meet the national environmental and safety guidelines and comply with the guidelines prescribed by the Karnataka State Pollution Control Board.

The technology of Biomass based power generation is well established in India and the project does not involve any transfer of technology.

A.4. Parties and project participants

Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Vasuki Power Private Limited (Private entity)	No

A.5. Public funding of project activity

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The project has not received any public funding

A.6. Debundling for project activity

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Appendix C, paragraph 2 of the Simplified Modalities and Procedures for Small-Scale CDM project activities states:

A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small scale activity at the closest point.

The project participant wishes to confirm that the proposed project activity is the first biomass based renewable energy project and there are no other projects which have been submitted to CDM Regisration / Registered CDM projects and also no biomass based power project in the same region. The project participant wishes to confirm that the project activity satisfies the criteria mentioned above and thus is not a debundled component of a large scale project activity.

[2] Tool to determine the remaining lifetime of equipment, Version 1.0 Annex 15, EB 50.

SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

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Title: Type I – Renewable Energy Projects
Reference: AMS –I.D. – Grid connected Renewable electricity generation, Version 17
Tool to calculate emission factor for an electricity system, Version 02.2.1

B.2. Project activity eligibility

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This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: a) Supplying electricity to a national or regional grid; or b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The proposed project activity involves installation of 10.00 MW renewable biomass based power plant that supplies electricity to state electricity grid. Hence this condition is applicable.
This methodology is applicable to project activities that: a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); b) Involve a capacity addition; c) Involve a retrofit of (an) existing plant(s); d) Involve a replacement of (an) existing plant(s).	The proposed project activity is a Greenfield project, involving the installation of a new renewable energy power plant. Hence condition (a) is applicable.
Hydro power plants with reservoirs that satisfy atleast one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in volume of reservoir • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and power density of project activity, as per definitions given in Project Emissions section, is greater than 4 W/m^2 • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2	The proposed project activity is biomass based power generation. Hence, this condition is not applicable to the proposed project activity.
If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligible limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The proposed project activity does not involve any non-renewable components. The total installed capacity of project activity is 10 MW and shall remain below the threshold limit of 15 MW for the entire crediting period.
Combined heat and power (co-generation) systems are not eligible under this category.	The project activity involves only power generation and is not a co-generation unit.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity	Not Applicable, since the project activity is a Greenfield project.

of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	Not Applicable. The project activity is a Greenfield project.

The proposed project activity is a 10 MW, biomass based power project. The project activity is eligible to use the methodology since project activity generates and exports the renewable electricity to a grid system. The capacity of the project activity is well below the qualifying limit of project activities specified under the small scale methodology AMS-I.D. i.e. 15 MW. Hence, AMS-I.D. renewable electricity generation is applied for the proposed small scale project activity.

B.3. Project boundary

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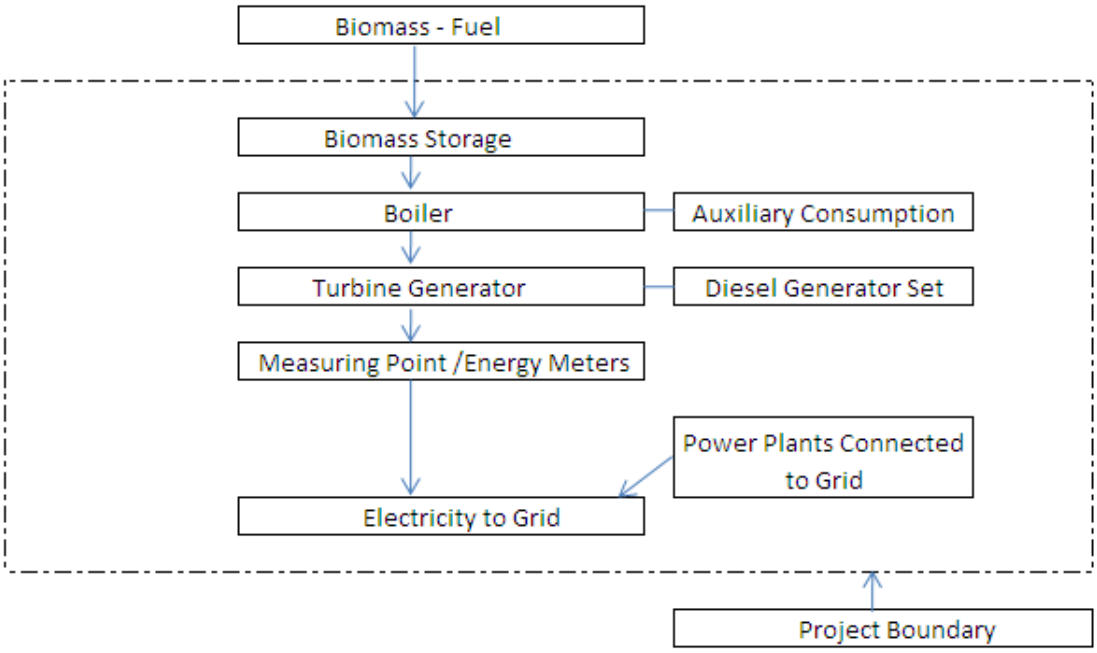
In line with the guidance in "Appendix B of the simplified modalities and procedures for small-scale CDM project activities" the boundary "encompasses the physical, geographical site of the renewable generation source".



Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	In the absence of the project activity equivalent amount of electricity would have been generated by the operation of existing/proposed power plants dominated by fossil fuel based power plants connected to Southern Regional grid
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project scenario	Grid connected biomass based power based electricity generation	CO_2	Yes	The electricity consumed / imported from the Grid and any onsite fossil fuel consumption and also leakage emissions if any.
		CH_4	No	
		N_2O	No	

For the purpose of the project activity the relevant grid is defined by the power generating units serving the same grid as the project activity. In line with the tool to calculate the emission factor for an electricity system, which states that "*If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used*", we have considered the regional grid that is delineated by the Central Electricity Authority of India.

In the case of India, there are regional grids which facilitate the transfer of electricity between states and which are supplied by central sector power stations operating in the region. The Indian power system is divided into two grids for the purposes of calculating the grid emission factor, namely the new integrated Northern, Eastern, Western, and North-Eastern regional grids and the Southern Regional grid. Karnataka is a part of the southern region as per the grid definitions outlined by the CEA and we have therefore utilized the analysis of the southern grid undertaken by the CEA in order to determine the baseline emission factor for electricity generation.

B.4. Establishment and description of baseline scenario

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According to AMS I.D, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. Accordingly the baseline for the project activity is the amount of electricity displaced or avoided in the grid system, calculated as the net energy displaced from the grid (MWh/y) multiplied by an emission factor for the regional grid system as applicable in host country.

The energy produced (MWh) by the renewable generating unit will be the net electricity exported to the ESCOM grid. The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor calculated in a transparent and conservative manner.

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y Baseline emissions in year, y (t CO_2)

$EG_{BL,y}$ Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO2,grid,y}$ CO_2 emission factor of the grid in year y (t CO_2/MWh)

To determine the emission factor of the grid, the methodology provides the option of choosing either

(a) Combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the Emission Factor for an electricity system";

Or

(b) The weighted average emissions (in t CO_2/MWh) of the current generation mix.

For the project activity, option (a) is chosen to determine the grid emission factor. This is referred in electricity system Version 02.2.1 for determination of CO_2 emission factor. The project employs the delineation of the project electricity system and connected electricity system published by Central Electricity Authority (CEA) India. The electricity generated by the project is supplied to the Southern Grid. This grid consists of independent state level electricity systems including public sector undertakings that exchange significant power within the region depending on the demand. The overall power flows are managed by the Southern Regional Load Despatch Centre. Therefore, the Sothern Regional Grid is considered as part of the relevant electric power system.

The baseline scenario for the project activity is grid based electricity generation and in India, national electricity policy 2005 & Electricity Act 2003, doesn't restrict the power producer for the choice of fuel for power production. Further there are no policies and circumstances which can prevent the implementation of baseline scenario.

In the host country India, Central Electricity Authority (CEA) is responsible for technical coordination and supervision of programmes and is also entrusted with a number of statutory functions. CEA publishes the emission factor data using combined margin approach based on approved methodology ACM0002. The project activity uses the latest CEA data as emission coefficient for baseline emission calculation.

The grid emission factor has been taken from the Central Electricity Authority, India "CO2 Baseline Database for the Indian Power Sector, Version 7.0, January 2012" (Source: http://www.cea.nic.in). The data provided by CEA database is tabulated below:

Simple Operating Margin (tCO_2/MWh)

Grid	2008-09	2009-10	2010-11
NEWNE	1.0202	0.9891	0.9820
South	**0.9704**	**0.9411**	**0.9396**
India	1.0094	0.9782	0.9725

Build Margin (tCO_2/MWh)

Grid	2010-11
NEWNE	0.8587
South	**0.7338**
India	0.8300

Emission Factor (tCO_2/MWh)

Operating Margin in tCO_2/MWh	0.9504
Build Margin in tCO_2/MWh	0.7339
Combined Margin in tCO_2/MWh	0.8421
Weight of OM	50%
Weight of BM	50%

Hence a combined margin (CM), for southern grid is 0.8421 is considered.

B.5. Demonstration of additionality

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The Project Participant has envisaged the project as a CDM project activity since it's conceptualisation. CDM related benefits have been seriously considered in the decision making of the Project Participant which is evident from the Board Meeting held on 10/11/2011 and the intimation sent to UNFCCC & MoEF (Host Party DNA) on 22/11/2011[3].

As per the applicable methodology AMS I.D., version 17, "The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid".

Additionality:

The project activity falls under the small scale category, the latest "Guidelines on the Demonstration of Additionality of Small-Scale Project Activities", Version 9.0, EB 68[4] is applied to demonstrate the additionality. The Project Participant is venturing first time into developing Greenfield biomass based power project and is convinced that registering the project activity under CDM would help the project to sustain in the long term. Some of the key barriers are discussed below:

Investment Barrier

Investment barrier: *a financially more viable alternative to the project activity would have led to higher emissions;*
Best practice examples include but are not limited to, the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis (where CDM is the only revenue stream such as end-use energy efficiency). It is recommended to use national or global accounting practices and standards for such an analysis.

[3] http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html
[4] Attachment A to Appendix B was available when the PDD was webhosted for GSCP.

Simple cost analysis is not applicable as the project activity sells electricity to the Utility and obtains economic benefits in the form of electricity tariffs.

The alternative to the project activity is continuation of current situation i.e. no project activity, in that case equivalent amount of electricity would have been produced by the grid electricity system. This option will not require capital investment. Hence **investment comparison analysis** (option II) cannot be applied.

The Project Participant proposes to use **Option III – Benchmark Analysis.** The guidance to investment analysis issued in EB 62 (paragraph 12) states that in cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity (Cost of Equity) are appropriate benchmarks for equity IRR.

The tool for demonstration and assessment of additionality [para-5, sub step 2(b)] states that in cases where the project has more than one potential developer, the benchmark shall be based on parameters that are standard in the market, considering the specific characteristics of the project type.

The project under consideration is a biomass based power project which has multiple potential investors; therefore as per paragraph 13 & 15 of guidance on assessment of investment analysis version 5.0, EB 62,

Para 13: In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market. The DOE's validation of the benchmark shall also include its opinion on whether a company-specific benchmark or a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity.

Para 15: If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors".

Based on above latest guidelines of EB 62 the cost of equity benchmark has also been calculated based on default values. As the analysis has been carried out in nominal terms, the default value of expected return on equity (given in real terms in EB 62 Annex 13) has been adjusted with the inflation. The inflation value has been taken as per the forecast by the Reserve Bank of India (RBI).

The PP compared the IRR with respect to the following benchmark: **17.78%** is the Return on Equity (RoE)
((1+ Benchmark real)*(1+ inflation rate)-1)

Default value for Real Benchmark provided by UNFCCC in "Guidelines on the Assessment of Investment Analysis, Annex 05, EB 62" Version 5.0, is = 11.75% and the Projected Inflation Rate for India in next 10 years is = 5.4%[5]

According to the version 05 of the "GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS", a project proponent can use either Project IRR or Equity IRR as a financial indicator. The investment decision for the project is taken by the equity investor and therefore the decision to invest in the project is based on the return derived by the equity investor based on an equity based return i.e.

[5] Expected Inflation rate for over 10 years period has been published by RBI (http://rbi.org.in/scripts/PublicationsView.aspx?id=13050). As per investment guidance, inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. The crediting period for the project activity is 10 years and the mean WPI and CPI inflation rate are 5.40% and 6.4%. Conservatively, PP has selected 5.40% inflation rate based on data published by RBI

Equity IRR. Project IRR does not take in to account effect of different financing structures on any project. Investment decisions are as much dependent on financing structures as they are on other project parameters and have significant impact on investment viability. Therefore it would not be appropriate to ignore the financing structure as it forms an important parameter to any investment decision. Considering above, Post Tax Equity IRR is considered to be the most appropriate financial indicator for investment analysis.

Financial Analysis / IRR:

The PP has envisaged that cost of biomass has pivotal role in defining the economic viability of the project activity. When the PP conceived the idea of developing the biomass power project the cost of biomass per tonne was Rs. 900 to 1,000 which as per the KERC Order 2005. The Porject Participant decided to assess the biomass availability and cost in the project vicinity and appointed Tide Technocrats Private Limited (third party) to perform the assessment in 3 distance ranges: 25km radius, 25-50 km radius and 50 -100 km radius from plant location. The assessment revealed that the average landed cost of biomass was varying from Rs. 1000 to 1400 per tonne.

The Project Participant has computed the IRR to assess the financial viability of the project activity the IRR related assumptions are presented in the table below:

Description	Value	Units	Source
Project Size	10	MW	Detailed Project Report.
Operating Hours	24	Hrs	Detailed Project Report.
Days of Operation	340	Days	Detailed Project Report.
Plant Load Factor	75	%	Detailed Project Report.
Annual Generation	612.00	MWh	Calculated
Auxiliary Consumption	9	%	KERC Order, 2009
Net Generation	556.92	MWH	Calculated
Plant Cost	495.30	INR. Million	Detailed Project Report.
Debt: Equity	70:30	%	KERC Order, 2009
Debt	346.70	INR. Million	Calculated - DPR
Equity	148.60	INR. Million	Calculated – DPR
Loan Repayment Period	10	Years	KERC Order, 2009
Interest Rate	14.75	%	State Bank of India, Prime Lending Rate. https://www.sbi.co.in/webfiles/uploads/files/1337418254421_PRIME_LENDING_RATE.pdf
Tariff	3.66	Rs. /kWh	KERC Order, 2009, this is fixed tariff for the first year. Tariff upto 10th year is provided in Appendix 7 of the PDD.
Escalation in Tariff from 11th Year	5%	Rs /kWh	As per the information available only Punjab State describes escalation for Biomass Projects, hence the same value is applied in the financial

			calculations. http://www.mnre.gov.in/schemes/grid-connected/biomass-powercogen
Biomass Landing Cost	1,320	INR. Per tonne	Based on Biomass Supplier Offer
Escalation in Biomass cost per tonne	5	%	KERC Order, 2009
Biomass Required	65, 239	MT/Year	Calculated
Operation & Maintenance (O&M) Cost	4	% of total capital cost	KERC Order, 2009
O&M Escalation from 2nd year onwards	5	%	KERC Order, 2009
Corporate Income Tax	32.45	%	http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/forms2010/pamphets/COMPANIES_2011_12.htm
Minimum Alternate Tax	20.01	%	http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/forms2010/pamphets/COMPANIES_2011_12.htm
MNRE Capital Subsidy for 10 MW (20 Lakhs * 10 MW ^0.646)	88.52	INR	http://www.mnre.gov.in/schemes/grid-connected/biomass-powercogen/

The results of Equity IRR (post tax) without CDM revenues are presented below:

Equity IRR post tax is: 11.07 **%.**

The IRR after considering CDM revenues (@ 6 Euros per CER) works out to be: 15.72% % (post tax) which is higher than the normal IRR but just below the benchmark. However, it is evident that consideration of CDM revenues in the computation of IRR boosts the returns and as well break even period.

The Project Participant has initiated the process for availing the debt from lenders and have performed the investment analysis - Internal Rate of Return (IRR) on both the scenarios, viz IRR without CDM and IRR with CDM revenues have been projected. The lenders would be convinced to lend if the project has better returns and at the same time, the debt is serviced as per the agreed terms. Hence the PP is convinced that CDM and its related benefits would help the project activity to be sustainable in the long term.

Sensitivity Analysis:

Sub-step 2d of the Investment Analysis: Sensitivity analysis (only applicable to Options II and III): Sensitivity Analysis

To assess how the project economics would work out under different scenarios, the PP has performed the sensitivity analysis for the following parameters:

1. Project Cost
2. Tariff
3. Fuel Cost
4. Plant Load Factor
5. Operation & Maintenance (O&M)

Sensitivity Analysis			
	Variation	IRR Post Tax	Base IRR
Project Cost			
Variation	-10%	12.88%	
	10%	9.49%	
Tariff			
Variation	-10%	3.43%	
	10%	18.81%	
Fuel Cost			
Variation	-10%	15.37%	
	10%	6.81%	**11.07%**
PLF			
Variation	-10%	7.97%	
	10%	14.46%	
	-15%	6.41%	
	15%	16.17%	
	-20%	4.78%	
	20%	18.05%	
O&M			
	-10%	12.00%	
	10%	10.17%	

In only one scenario, the IRR crosses the benchmark :

Tariff escalates 10% every year: The IRR works out to 18.81% . However, this is an unlikely scenario, since the first ten year's tariff is already fixed by KERC (Karnataka Electricity Regulatory Commission), as per the order dated 2009 & change in tariff offered is limited.

Scenarios where IRR would be breaching the benchmark;

Sensitivity Analysis			
	Variation	IRR Post Tax	Benchmark
Project Cost			
Variation	-32%	17.83%	
Tariff			
Variation	10%	18.81 %	

Fuel Cost			
Variation	-16 %	17.81%	**17.78%**
PLF			
Variation	20 %	18.05%	
O&M			
	-74%	17.82%	

Project Cost: The cost of project reducing by 32% % is unlikely since the cost of equipment projected in the Detailed Project Report was based on the best information available in 2011 and the possibility of increase in the project cost is quite likely and reduction is project cost is limited.

Tariff: Tariff increasing by 10% every year, this is an unlikely scenario, since the first ten year's tariff is already fixed by KERC (Karnataka Electricity Regulatory Commission) and also the year on year escalation has also been considered in the computation, as per the order dated 2009 & change in tariff offered is limited and further escalation of 10% on the tariff on year on year basis is quite unlikely scenario.

Fuel Cost: The probabilities of cost of fuel decreasing by 16 % are limited or unlikely the history of the fuel cost has always seen an increased trend rather than decrease.

Plant Load Factor: The PLF of 90% viz.,20 % more than the estimated PLF of 75%. The plant may achieve 90 % for short intervals of time, but not on continuous basis.

Operation & Maintenance Cost: The probability of O&M cost decreasing by 74 % is less, since the cost of spares, services are expected to increase due to inflation and the O&M cost reducing by 74 % is unlikely.

The PP is convinced that the foreseen risks such as increase in biomass cost and fixed tariff would be minimised through the additional CDM revenues and making the project economically viable in the long term. Registration of the project as a CDM project activity would increase the confidence of the lenders and the potential equity investors in this project.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

>>

Approved Simplified baseline and monitoring methodology AMS-I.D., Version 17, "Grid connected Renewable electricity generation" is chosen for the proposed project activity. As per paragraph 11 of the methodology, the baseline emissions are calculated as *the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.*

Baseline Emissions

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y	Baseline Emissions in year *y* (t CO_2)
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of implementation of the CDM project activity in year *y* (MWh)
$EF_{CO2,grid,y}$	CO_2 emission factor of the grid in year *y* (t CO_2/MWh)

The grid emission factor is calculated in a transparent and conservative manner in accordance with paragraph 12(a) of AMS-I.D., which states that **a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the '*Tool to calculate the Emission Factor for an electricity system*'**. The grid emission factor has been fixed ex-ante for the project activity, as explained in section B.4.

Project Emissions

According to paragraph 20 of AMS-I.D., the project emission from the proposed project is zero. However, the CO_2 emissions from chipping of biomass, onsite consumption of fossil fuels due to project activity and CO_2 emissions due to transportation of biomass are accounted.

Project Emissions for chipping / cutting of biomass:

The electricity consumed for chipping or cutting of biomass would be part of the auxiliary consumption in form of Electricity Import from Grid would be accounted.

Project emissions due to diesel consumption:
The project activity will be equipped with a diesel generator to meet the emergency requirements of the power plant. Hence, the emissions due to the usage of diesel will be accounted as project emissions.

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

Where:

PE_y	: Project emissions from on-site fossil fuel combustion in year y, tCO2e
$\Sigma FC\ Diesel,_y$	: Quantity of fossil fuel combusted in the project plant in year y, tone or volume
$NCV\ Diesel,_y$	: Net calorific value of fossil fuel in year y, TJ/tone or TJ/volume
$EF\ Diesel,_y$	: Emission factor for fuel i; IPCC default value, tCO2/ TJ

As per "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02)", Annex 11, EB 41. The data pertaining to the chemical composition of fossil fuel may not be available consistently, hence of the two options in the tool, Option B has been chosen.

Option B: The CO2 emission coefficient COEFi,y is calculated based on net calorific value and CO2 emission factor of the fuel type i, as follows:

$COEF_{i,y} = NCV_{i,y} \times EFCO2,_{i,y}$

Where:

$COEF_{i,y}$= Is the CO2 emission coefficient of fuel type i in year y (tCO2/mass or volume unit)

NCVi,y = Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)

EFCO2,i,y = Is the weighted average CO2 emission factor of fuel type i in year y (tCO2/GJ)
i = Are the fuel types combusted in process j during the year y

Leakage

As per paragraph 21 of AMS-I.D., leakage is only considered if the energy generating equipment is transferred from another activity. The proposed project activity is a Greenfield project and there is no such shift of equipment involved; hence leakage can be neglected.

As per Attachment C to the Appendix B, it has been specified for the small scale project activity, the leakage emission sources can be identified as follows:

Shifts of pre-project activities:
As the project activity utilises biomass residues such as cotton stalks, maize stalks, rice husk etc, the implementation of project activity do not lead to shifting of pre-project activities.

Emissions from production of renewable biomass:
The proposed project activity uses biomass residues from agricultural crops. This waste would have anyways been generated even in absence of project activity. The project activity only utilizes the biomass residues and does not involve the production of renewable biomass . Hence, there are no emissions from the production of biomass.

Competing uses for biomass:
.

The project proponent has conducted a detailed biomass survey in the region at three distance ranges: less than 25 km, 25 - 50 km and 50 - 100 km from the plant location. Within a limited band of 25 kms, the collectable surplus biomass availability is 2.31 lakh tonnes per annum and in the distance band of 0-50 km, the collectable surplus biomass availability is 3.92 lakh tonnes per annum. Whereas the biomass requirement for the proposed project activity is approximately 65,239 tonnes per year at 75% PLF which is about 20% of the collectible surplus biomass in the 50 km radius area and about 33% of the collectible surplus biomass in the 25 km radius area.

It is evident that the quantity of available biomass in the region is larger than 25%, after accounting the quantity of biomass that is utilised including the project activity. The leakage emissions would be considered if the biomass is transported from beyond the 200 Kilometres range.

The average biomass requirement as per the DPR varies from 10 to 10.30 tonnes per hour, when the same is calculated for 340 days of operation at 75%, the biomass requirement at 10.30 per hour for the entire year works out to be 63,036. The biomass requirement is stated as 65, 239 tons (10% more than the calculated value of 63, 036). The estimated value can be considered to be conservative since there may be wastages, difference in calorific value and moisture content these factors have an impact on the assumptions of fuel requirements.

As per the "Methodological tool Project and leakage emissions from transportation of freight" - Version 01.1.0 - EB 70, the transportation of biomass (65,239) related emissions works out to be 0.179% every year, hence the same is neglected. The detailed calculation of the same is provided in the emission reduction calculation work sheet.

Emission Reductions

The emission reductions from the project activity are calculated from the application of the following equation:

$ER_y = BE_y – PE_y – LE_y$

Where:

ER_y	Emission Reductions in year *y* (t CO_2/y)
BE_y	Baseline Emissions in year *y* (t CO_2/y)
PE_y	Project Emissions in year *y* (t CO_2/y)
LE_y	Leakage Emissions in year *y* (t CO_2/y)

B.6.2. Data and parameters fixed ex ante

Data / Parameter	**OM**
Unit	tCO_2/MWh
Description	Operating Margin of the Southern Regional Grid
Source of data	Value derived from the CEA CO_2 Baseline Database, Version 7.0
Value(s) applied	0.9504
Choice of data or Measurement methods and procedures	The value is deduced from the Central Electricity Authority (CEA) of India, which is a credible organisation, which is under Government of India (Ministry of Power). The information is available on the public domain and the values are calculated based on the "Tool to calculate the emission factor for an electricity system". Average calculated based on the last three years data.
Purpose of data	For calculating baseline emissions
Additional comment	Will be fixed ex-ante for the entire crediting period

Data / Parameter	BM
Unit	tCO_2/MWh
Description	Build Margin of the Southern Regional Grid
Source of data	Value derived from the CEA CO_2 Baseline Database, Version 7.0
Value(s) applied	0.7338
Choice of data or Measurement methods and procedures	The value is deduced from the Central Electricity Authority (CEA) of India, which is a credible organisation, which is under Government of India (Ministry of Power). The information is available on the public domain and the values are calculated based on the "Tool to calculate the emission factor for an electricity system".
Purpose of data	For calculating baseline emissions
Additional comment	Will be fixed ex-ante for the entire crediting period

Data / Parameter	CM
Unit	tCO_2/MWh
Description	Combined Margin of the Southern Regional Grid
Source of data	Calculated based on the values derived from the CEA CO_2 Baseline Database, Version 7.0
Value(s) applied	0.8421
Choice of data or Measurement methods and procedures	The value is deduced from the Central Electricity Authority (CEA) of India, which is a credible organisation, which is under Government of India (Ministry of Power). The information is available on the public domain and the values are calculated based on the "Tool to calculate the emission factor for an electricity system". The same is a calculated.
Purpose of data	For calculating baseline emissions
Additional comment	Will be fixed ex-ante for the entire crediting period

Data / Parameter	NCV of Diesel
Unit	TJ/Gg
Description	Net Calorific Value of Diesel
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, Table 1.2
Value(s) applied	43.3
Choice of data or Measurement methods and procedures	IPCC default value at the upper limit of the uncertainty at a 95% confidence interval is used
Purpose of data	For calculating baseline emissions
Additional comment	Will be fixed ex-ante for the entire crediting period

Data / Parameter	ρ_{diesel}
Unit	kg/m^3
Description	Density of Diesel
Source of data	Regional Values - http://www.iocl.com/products/dieselspecifications.pdf
Value(s) applied	860
Choice of data or Measurement methods and procedures	The value of the density of the diesel has been taken based on regional values available.
Purpose of data	For calculating baseline emissions
Additional comment	Will be fixed ex-ante for the entire crediting period

B.6.3. Ex-ante calculation of emission reductions

>>

The Ex-ante calculation of emission reduction is estimated according to the available equations provided in the methodology in a transparent and conservative manner:

Installed Capacity		MW	10
Auxiliary Consumption		%	9.00%
Operating Days		Days	340
Hours		Hours	24
Boiler Capacity		TPH	45
PLF		%	75%
Gross Generation		MWh	61,200
Net generation		MWh	55,692

Baseline Emissions:

BEy = EGBL, y x EFCO2,y = 55,692 * 0.8421 = 46,900 tCO_2

Project Emissions:

PEFC,j,y = ΣFCi,j,y x COEF i,y = 0

For the project activity, PEy = PEFC,j,y = 0

Leakage Emissions:

Ly = 0 (please refer section B.6.1)

Emission Reduction:

ERy = BEy – PEy – Ly = 46,900 tCO_2

B.6.4. Summary of ex-ante estimates of emission reductions

Year	Estimation of project activity emissions (tCO2 e)	Estimation of baseline emissions (tCO2 e)	Estimation of leakage (tCO2 e)	Estimation of overall emission reductions (tCO2 e)
Year 1	0	46,900	0	46,900
Year 2	0	46,900	0	46,900

Year 3	0	46,900	0	46,900
Year 4	0	46,900	0	46,900
Year 5	0	46,900	0	46,900
Year 6	0	46,900	0	46,900
Year 7	0	46,900	0	46,900
Year 8	0	46,900	0	46,900
Year 9	0	46,900	0	46,900
Year 10	0	46,900	0	46,900
Total (tonnes of CO2 e)	0	469,000	0	469,000

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter:	**$EG_{Facility, y}$**
Data unit:	MWh
Description:	Net Electricity supplied to the Grid
Source of data to be used:	Joint Meter Readings (JMR) and the subsequent Form – B statement
Value of data	Approximately 55,692 MWh per annum
Description of measurement methods and procedures to be applied:	The net electricity supplied to the grid is calculated value which is determined by subtracting the total import to the grid by total export to the grid. Monitoring: Continuous Measurement Frequency : Monthly Type of Meter : Tri-vector meter Type of Meter : Tri-vector meter Cross Checking: By means of invoice raised on the State Utility / Receipt of the payment from the State Utility.
QA/QC procedures to be applied:	The energy meter installed at the site is of 0.2s Accuracy class. Calibration Frequency of Energy Meter: Once in a year.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

Data / Parameter:	**$EG_{export, y}$**
Data unit:	MWh
Description:	Electricity Exported to Grid
Source of data to be used:	Joint Meter Readings (JMR) and Form B statements
Value of data	Approximately 61,200 MWh per annum
Description of measurement methods and procedures to be applied:	Gross electricity exported to the grid is measured in the energy meter located at the project site. Frequency: Continuous Measurement : Monthly Type of Meter : Tri-vector meter Cross Checking: The same can be cross checked from JMR Statements /By means of invoice raised on the State Utitliy / Receipt of the payment from the State Utility.

QA/QC procedures to be applied:	The energy meter installed at the site is of 0.2s Accuracy class. Calibration Frequency of Energy Meter: Once in a year.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

Data / Parameter:	**$EG_{import, y}$**
Data unit:	MWh
Description:	Electricity Imported from Grid
Source of data to be used:	Joint Meter Readings (JMR) and Form B statements
Value of data	0MWh per annum,
Description of measurement methods and procedures to be applied:	The electricity imported from the grid is measured in the energy meter located at the project site. The imported electricity would be monitored monthly and the project emissions related to the same would be accounted in the emission reduction calculations. Frequency: Continuous Measurement : Monthly Type of Meter : Tri-vector meter Cross Checking: The same can be cross checked from JMR Statements /By means of invoice raised on the State Utility / Receipt of the payment from the State Utility.
QA/QC procedures to be applied:	The energy meter installed at the site is of 0.2s Accuracy class. Calibration Frequency of Energy Meter: Once in a year.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

Data / Parameter:	**$FC_{i, j, y}$**
Data unit:	m^3/y or MT/y
Description:	Quantity of fossil fuel type i combusted in process j during year y.
Source of data to be used:	Log Book and Purchase Orders
Value of data	0.
Description of measurement methods and procedures to be applied:	The diesel generator set would be used only in case emergency and as back up. The consumption of diesel would be monitored monthly and would be recorded in log books at the project site. The diesel would be stored in daily tanks and rulers would be used to determine volume of the diesel consumed.
QA/QC procedures to be applied:	The ruler gauge will be part of the daily tank and the readings of the same would be recorded daily in the log books. The ruler gauge will be calibrated once in a year.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

Data / Parameter:	**$Biomass_{iy}$**
Data unit:	Ton/y
Description:	Total Biomass consumed in a year
Source of data to be used:	Log Book and Purchase Orders
Value of data	65,329 Ton/Year
Description of	Each type of dry biomass would be measured on a daily/weekly / monthly basis,

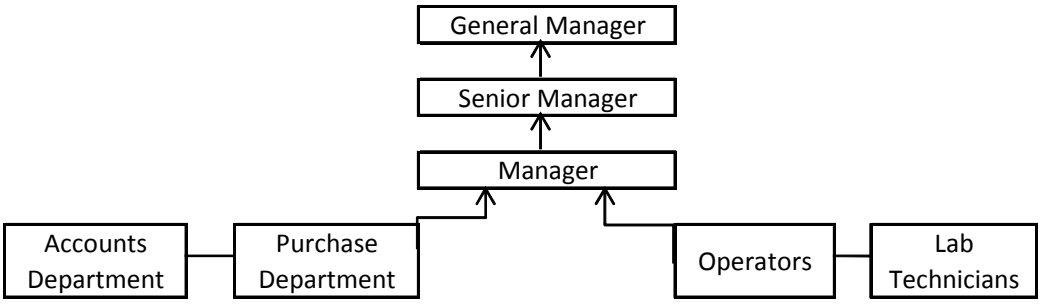
measurement methods and procedures to be applied:	the frequency of measurement would be based on the incoming biomass load. For different type of biomass separate records would be maintained Rice Husk : Cotton Stalks : Chilly Stalks : Coconut Shell :
QA/QC procedures to be applied:	Weighing bridge at the project site would be used for measuring the incoming dry biomass load. The biomass suppliers would also carry their own weigh bridge receipts for the biomass supplied. The biomass procured would be recorded in the log books. The weighing bridge would be calibrated once in a year.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

Data / Parameter:	**NCV_{iy}**
Data unit:	kCal/kg
Description:	Net Calorific Value of each biomass used
Source of data to be used:	Third Party Lab report
Value of data	Rice Husk : 3000 kcal/kg Cotton Stalks : 1700 kcal/kg Chilly Stalks : 1750 kcal/kg Coconut Shell : 3000 kcal/kg
Description of measurement methods and procedures to be applied:	Each biomass would be tested in a third party laboratory. Frequency of testing: Quarterly The testing would be performed in an Accredited Laboratory.
QA/QC procedures to be applied:	The project activity would use different types of biomass and for individual biomass NCV test would be carried out every quarter. The test reports would be made available to the DOE at the time of verification.
Any comment:	The data would be stored for 10 + 2 years (after the crediting period).

B.7.2. Sampling plan
>> Not Applicable

B.7.3. Other elements of monitoring plan
>>
The PP has systems and procedures in place to monitor the parameters which are essential for day to day operations which includes the parameters of the CDM project activity also.

The roles and responsibilities are defined as:



Operator: It is responsibly of the operator to monitor the daily biomass consumption in boiler, there are 3 operators for 3 different shifts (the plant has 8 Hrs x 3 Shifts = 24 Hrs). The operator is also responsible for monitoring and recording the feed (fuel), pressure, gas and temperature.

Stores Department: Is responsible for keeping the track of availability of biomass in the stock and also the biomass which are consumed in the plant. Based on the availability & consumption pattern, the stores would place a material request slip to the Purchase Department for placing the order for purchase of biomass.

Laboratory: The lab personnel are responsible for performing the physical check of the biomass and chemical check (Combustion Strength, Moisture Content, Ash Content & Volatile Matter).

Manager & Senior Managers: The log book data, stores data and laboratory report are submitted to the Manager – Production. The technical data collected by the operator, the biomass storage and consumption data are verified by the manager and in case of any discrepancies, corrective actions are suggested. The information & data assessed by the manager is then forwarded to the Senior Manager and upon his assessment, the same is forwarded to General Manager.

Purchase Department: Is responsible for placing the purchase orders for biomass based on the request from the stores. The department is also responsible for maintaining the records pertaining to the purchase of biomass, invoices of the suppliers & weigh bridge records of the incoming trucks carrying the biomass. Further records are collaborated and then sent finally to the accounts department.

Accounts Department: Is responsible for maintaining records pertaining to the biomass, such as purchase orders, invoices, consignment receipts and the payments made to the biomass suppliers.

General Manager: Is the person responsible for the day to day operations in the plant. The monthly consolidated reports submitted by respective Senior Managers & Managers are reviewed. In case of any mismatch or discrepancies, the GM would suggest corrective actions to be incorporated in the plant for effective operation and data collection.

QA & QC Procedures:
Data Archiving: Data would be archived in both physical (paper) and electronic format for the whole crediting period and additional two years after the crediting period.

Data Discrepancy: The data recorded is daily checked by the operators and further same data is checked and verified by the Manager and Senior Manager. Further the monthly consolidated reports of fuel purchase, usage, electricity generation are submitted to the General Manager. The reports are verified and cross checked, during this assessment if there is any mismatch or erroneous data found during this assessment, immediate corrective action is taken at the concerned level by the concerned Manager or Senior Manager.

Failure of Meter: The electricity measured would be monitored in two energy meter a) Main Meter and b) Check Meter. In case of faulty / failure of Main Meter the readings taken from check meter would be used for the recording, billing and determining the emission reductions. In case of faulty / failure of check meter, the main meter readings would be used for calculating emission reductions. In either cases when meter / s are found to be faulty, the concerned authorities would be requested to perform the calibration.

Emergency Preparedness: In case of failure of both main & check meter, the Project Participant would request the concerned authorities to perform meter replacement or meter calibration whichever is relevant. During this period there would be no monitoring of electricity generation and thereby no emission reduction be claimed during the process of meter calibration or meter / s change.

SECTION C. Duration and crediting period

C.1. Duration of project activity
C.1.1. Start date of project activity
>>
01/02/2013 (Date for placing the purchase order on the equipment supplier).

C.1.2. Expected operational lifetime of project activity
>>
25 years 00 months

C.2. Crediting period of project activity
Fixed crediting period has been chosen.

C.2.1. Type of crediting period
>>
The PP has chosen a fixed crediting period of 10 years 00 Months

C.2.2. Start date of crediting period
>>31/12/2012 or date of project registration with UNFCCC or commercial operation of the plant, whichever is later.

C.2.3. Length of crediting period
>>
10 years 00 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

The project activity does not require to perform Environmental Impact Assessment (EIA) as per 2006 EIA notification of the host country (India)[6].

There are no negative environmental impacts arising from the project activity. Hence the project participant does not consider the environmental impacts to be significant and no EIA study has been conducted.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>

The local stakeholders who face the immediate effect due to the project activity, which involves effect on the local environment, social life and economics, were identified on the basis of their involvement at various stages of project activity. The Project Participant invited the local stakeholders by

i) Publishing the notice on 31/10/2011 in Moodana (Local Newspaper) ;
ii) Personal invitations were sent to the stakeholders and,
iii) an invitation copy was also displayed on the notice board of the local Gram Panchayath.

The local stake holder meeting was organised by M/s. Vasuki Power Pvt. Ltd., on 5th November 2011, at the project site in Chillura Village, Savanur Taluk, Haveri District, Karnataka State, India. The management explained the stakeholders about the project, Kyoto protocol and various benefits of the project to local and global environment. The PP distributed feedback forms to the stakeholders and requested them to record their feedback & comments about the project activity. The duly filled stakeholder feedback forms will be made available to the DOE during validation.

E.2. Summary of comments received

>>

The local stakeholders were informed about possible generation of employment, additional income to the farmers by the purchase of biomass and mitigation of air pollution as a result of the proposed biomass based power plant. The villagers were appreciative of the project and its associated benefits and no adverse comments have been received. Some of the queries received during the stakeholders meeting are furnished below:

Stakeholder Name: Ms. Parvathi. P. Hommbal
Question: Whether there is any impact on the environment due this project activity?
PP Response: The project uses renewable biomass which is locally available in this region, there is no cutting of trees or use of any coal to produce power. The project is environmental friendly.

Stakeholder Name: Mr. Mohammed Ghous Nadaf. H
Question: Whether there is would be any affect on the local environment, human beings and other living beings?

[6] http://envfor.nic.in/legis/eia/so1533.pdf - EIA Notification -2006

PP Response: The project would procure the locally available biomass which is renewable and does not lead to any pollution, the same would be used for power generation. The project activity would not lead to any kind of pollution which would affect the local environment, human beings and other living beings.

Stakeholder Name: Mr. Moudeen Saab Nadaf
Question: Whether local electricity problem will be solved due to this project?
PP Response:
The electricity generated is fed to the state electricity grid, and the state decides to allocate the electricity at its disposal

E.3. Report on consideration of comments received
>>
All the queries and comments raised during the stake holder meeting were answered satisfactorily, as it is evident from the summary of comments above. No negative comments were received during the meeting and the project activity was appreciated by all the stakeholders. There were no adverse comments or specific appeals raised by any of the stake holders during the meeting. Hence the PP is not due on any account and hence no action is required.

SECTION F. Approval and authorization
>>
The PP submitted the relevant documents to Host Party DNA, the Host Country Approval was received on 12/10/2012, with reference no: 4/10/2012-CCC..

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Appendix 1: Contact information of project participants

Organization:	Vasuki Power Private Limted.
Street/P.O.Box:	51/22, 4th Floor, 8th E Main Road, 4th Block, Jayanagar,
Building:	
City:	Bangalore
State/Region:	Karnataka
Postfix/ZIP:	560011
Country:	India
Telephone:	+91-80-4100547
FAX:	+91-80-26651127
E-Mail:	info@vasuki.in
URL:	www.vasuki.in
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last Name:	V
Middle Name:	
First Name:	Suresh Babu
Department:	-
Mobile:	+91 98440 66511
Direct FAX:	+91-80-26651127
Direct tel:	+91-80-4100547
Personal E-Mail:	sureshbabu@vasuki.in

Appendix 2: Affirmation regarding public funding

There is no public funding available for this project activity.

Appendix 3: Applicability of selected methodology

Please refer B. 6.1 to B. 6.3 section of this PDD

Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A2) applies (as per Table-2 of AMS-I.D Version 17):

Table-2: Applicability of AMS-I.D, AMS-I.F and AMS-I.A based on project types

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		×	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			×
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		×	
4	Project supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			×
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	×		

The project activity supplies electricity to the Southern Regional Grid of India, hence AMS – ID is applicable.

Appendix 4: Further background information on ex ante calculation of emission reductions

The details of the same are already provided in section B.6.3 of this PDD.

Appendix 5: Further background information on monitoring plan

Refer B.7.3 section of this PDD.

Appendix 6: Summary of post registration changes

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Appendix 7 – Tariff Structure as per KERC Order, 2009

Year	Tariff (Rs./unit)
1st Year	3.66
2nd Year	3.69
3rd Year	3.72
4th Year	3.77
5th Year	3.81
6th Year	3.86
7th Year	3.92
8th Year	3.99
9th Year	4.06
10th Year	4.13

History of the document

Version	Date	Nature of revision
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for small-scale CDM project activities" (EB 66, Annex 9).
03	EB 28, Annex 34 15 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02	EB 20, Annex 14 08 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>.
01	EB 07, Annex 05 21 January 2003	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		