Project design document form
(Version 11)

BASIC INFORMATION	
Title of the project activity	Chambal Power Limited's (CPL) proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	09
Completion date of the PDD	04/01/2020
Project participants	1. Suryaa Chamball Power Limited[1] (India) 2. WeAct Pty Ltd. (Australia)
Host Party	India
Applied methodologies and standardized baselines	AMS-I.D. version 18.0 – Grid connected renewable electricity generation Standardized Baseline: N/A
Sectoral scopes linked to the applied methodologies	01: Energy industries (renewable -/ non-renewable sources
Estimated amount of annual average GHG emission reductions	44,493 tCO_2e

[1] Valid from 02/12/2011, Name Change document – Certificate of Incorporation. Also name change is approved by host country DNA and addressed under the CDM-MOC.

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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This is a registered CDM project activity (Ref ID 0347). Project activity has successfully completed its first crediting period & going to complete its second crediting period on 29th of February 2020. The Suryaa[2] Chamball Power Limited (SCPL) (hereafter referred as "PP") is hereby submitting request for third renewal of crediting period in line with the Project Cycle Procedure para 279.

The total capacity of the project is 7.5 MW. The main purpose of the project activity is to generate and export green power to the Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), which is a transmission company of the Rajasthan State Electricity Board (RSEB). SCPL is a public limited company. SCPL has implemented the power plant near village Rangpur, District Kota in Rajasthan.

The project activity utilises the renewable biomass for generation of electricity. The setting up of fossil fuel-based power projects leads to the GHG emission which is a severe concern globally, while this project utilizing biomass (a renewable source), which is sufficiently available within 50 km diameter of selected location.

Biomass being a renewable source and considering the established fact that there would be no net emissions of CO_2 (GHG) from such renewable energy projects, this 'project activity' will also lead to no net onsite emissions in comparison to the emissions from the alternative fossil fuel-based power plants.

The project activity helps in reducing the ever-increasing demand and supply gap of electricity besides contributing towards economic growth and development of the area. The project activity apart from generating employment locally will provide economic value to the agricultural wastes and will provide stable and quality power to the local industry, farmers and households. The project will also create a business opportunity for local stakeholders such as bankers/consultants, equipment suppliers, equipment manufacturers, contractors, biomass suppliers, farmers, local community and the related. The following are some additional benefits of the project:

- Appropriate utilisation of surplus biomass
- Avoidance of burning of wasted agricultural residues
- Generation of environment friendly green power
- Reduction in Green House Gas (GHG) i.e. CO_2 emissions

Scenario existing prior to the implementation of project activity:
The Indian grid is dominated by conventional fossil fuel- based sources of energy. In the absence of the project activity equivalent amount of electricity would have been generated from grid[3] connected conventional power plants.

Pre-project scenario & Baseline Scenario are same:
In line with the applicable methodology AMS-I.D. (Version 18), "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."

[2] Please refer to 'Certificate of Incorporation' for the name change of the company from "SURYACHAMBAL POWER LIMITED" to "SURYAA CHAMBALL POWER LIMITED".

[3] As per CEA database version 14 (released in Dec 2018), in previous years the Indian electricity system was divided into two grids, the NEWNE and Southern Grid (SR), which are now integrated as a single 'Indian Grid' covering all the states.

Salient Features of the Project

The project activity involves the installation of 7.5 MW fully condensing steam turbine and a steam generator of 35 Ton per hour (TPH) capacity The steam generator is designed to generate 35 Ton per hour (TPH) steam at 67 kg/cm^2 and temperature 450±5°C at the super heater outlet considering feed water and temperature at economizer inlet as 170°C.

Project steam generator utilizes (renewable biomass) mustard husk and stalks, corn cobs, bagasse and other available agricultural wastes as fuel. The project is likely to export surplus power to RRVPNL after meeting the in-house auxiliary demand (of about 700 kW). In this regard, the power purchase agreement (PPA) for a 20-year period has been signed with the RRVPNL, which is still valid, for the sale of entire power generated by the project.

The power plant is designed to generate 7.5 MW gross power with net exportable power of 6.8 MW at 33 KV voltage through a step-up transformer.

All design calculations are based on the fuel composition referred to in Table 1

Fuel	C	H2	O2	N2	S	M	ASH	GCV Kcal/kg
Baggase	22.5	3	23	-	-	50	1.5	2270
Mustard Husk	39.88	4.17	39.37	0.67	0.6	9.1	6.7	3620
Corn Cobs	30.33	4.35	-	-	-	30.64	1.55	3480

Along with the 35-TPH boiler and the 7.5-MW Turbo-generator (TG), the other auxiliary units of the plant would include:

- Fuel handling system with storage and processing arrangements
- Ash handling system
- Air pollution control device
- Cooling water system and cooling tower
- De-Mineralized (DM) water plant
- Sire protection system
- Air conditioning and ventilation
- Complete electrical system for power plants and grid interconnection including power evacuation, instrumentation and control system etc.

The power would be generated at the biomass-based power plant, then evacuated from the 11/33 KV, HV switch yard of the proposed plant and will be exported to the RRVPNL grid system.

Ash Disposal

The ash generation will be in the range of 5 MT – 6 MT per day. This ash will be collected in the silo and supplied to the farmers for their use in the field since this ash can be mixed with fertilisers.

Project's contribution to sustainable development

The project activity is located a rural belt, which will contribute positively to the 'Sustainable Development of India'. The four pillars of sustainable development have been addressed as follows:

Social Well-being:

The plant is located in a village and there is no significant development of industry in and around the project site. Project activity will help in alleviating poverty to some extent by generating both direct and indirect employment in the area of skilled and unskilled jobs for operation and maintenance of the power plant. The productive use of a renewable agro waste will bring in associated economic and social benefits.

Economic Well-being:
Firstly the project has created jobs locally. The increase in demand of biomass used by the project will further have a local effect on its price and will generate additional revenue for the biomass suppliers and farmers. Generation of electricity using the same (biomass) as fuel evidently contributed to the economic well - being by generating revenue and inflow of funds. Local and central government have also be financially benefited from the project as it will help in the rural up-liftment of the farmers in the locality and is also consistent with the Government's rural development programme.

Environmental Well-being:
The project activity is a renewable energy power project, which will use biomass generated from the agricultural fields in the locality as fuel for power generation and then export clean power to RRVPNL. This electricity generation will substitute the power generation by RSEB, dominated by conventional fossil fuel-based projects or make power available for additional demand. Also the project by utilisation of renewable energy source will positively contribute towards reduction in finite natural resource like coal/gas/ oil thereby minimizing the depletion. The project will help to reduce the CO_2 emissions by reducing equivalent quantity of conventional fuel, which is a carbon emissive non-renewable resource. Indian economy is highly dependent on "coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India. Changing coal consumption patterns will require a multi- pronged strategy focusing on demand, reducing wastage of energy and the optimum use of renewable energy sources. The project would contribute towards achieving the same.

Technological well-being:
The project activity uses energy efficient and environment friendly technology in the renewable energy sector which includes a modern boiler designed to operate with biomass like mustard and soya husk and other available agricultural wastes.

The project activity contributed in a great way to environmental and social aspects and therefore sustainable development by capacity building of local people towards operation of modern technology power generation.

The Power plant is under operation since 31st March 2006. CERs have been issued for the power exported to the grid during the previous crediting period. Details are provided in below table:

Crediting Period (CP)	Status	Period	Issued CER
First	Completed	1st Mar 2006 to 28th Feb 2013	2,08,153 tCO_2e
Second	On going	1st Mar 2013 to 29th Feb 2020	90,796* tCO_2e
*CER issued for the 1st Monitoring Period [1st Mar 2013 to 30th Jun 2015] of Second CP.			
Second Monitoring Period [1st Jul 2015 to 31st Dec 2018] of Second CP is ongoing.			

A.2. Location of project activity

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1. Host Party (ies) : India
2. Region/ State/ Province, etc. : Rajasthan
3. City/ Town/ Community, etc. : Village Rangpur, District Kota
4. Physical/ Geographical location : 25º16'36" N (25.2766) and 75º56'22"E (75.9394)


INDIA
States and Union Territories
JAMMU & KASHMIR
Srinagar
HIMACHAL PRADESH
Shimla
Chandigarh
PUNJAB
UTTARANCHAL
Dehradun
DELHI
HARYANA
PAKISTAN
CHINA (TIBET)
ARUNACHAL PRADESH
NEPAL
SIKKIM
Gangtok
BHUTAN
Itanagar
UTTAR PRADESH
RAJASTHAN
Jaipur
Lucknow
Patna
BIHAR
ASSAM
Dispur
NAGALAND
Kohima
Shillong
Imphal
MANIPUR
MEGHALAYA
Agartala
TRIPURA
Aizawl
MIZORAM
GUJARAT
Gandhinagar
Bhopal
MADHYA PRADESH
Ranchi
JHARKHAND
WEST BENGAL
Calcutta
CHHATTISGARH
MYANMAR
DIU
DAMAN
DADAR & NAGAR HAVELI
MAHARASHTRA
Mumbai (Bombay)
ORISSA
BANGLADESH
ARABIAN SEA
Panaji
GOA
KARNATAKA
Bangalore
LAKSHADWEEP
MAHE (Pondicherry)
KERALA
Thiruvananthapuram
RAJASTHAN
District Map
PUNJAB
HARYANA
PAKISTAN
UTTAR PRADESH
MADHYA PRADESH
GUJARAT
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Surya Chambal Power Plant, Rangp
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Google earth
Imagery Date: 2/4/2011
2002
25°16'27.98" N 75°56'08.90" E elev 825 ft
Eye alt 14364 ft

A.3. Technologies/measures

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The project meets the applicability criteria of the small-scale CDM project activity category;

Type-I: renewable energy projects (AMS-I.D. Grid connected renewable electricity generation) of the indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories. As per the applicable methodology para 2, "This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and **renewable biomass:** Supplying electricity to a national or a regional grid…

Project activity is a grid-connected biomass-based power plant with fuels such as mustard and soya husk and stalks, corncobs and baggase, fired in the boiler, with a high-pressure steam turbine configuration having a capacity of 7.5MW.

Sr. No	Steam Generator	Make
1.	35 TPH, 67 kg/cm^2, 450 ±5^{0}C	WEG Indusrias S.A.

Sr. No	Turbine Details	Make
1.	7.5 MW Fully Condensing	Triveni Engineering and Industries Ltd

The power plant is designed to generate 7.5 MW gross power with net exportable power of 6.8 MW at 33 KV voltage through a step-up transformer. The steam generator is designed to generate 35 Ton per hour (TPH) steam at 67 kg/cm2 pressure and 450± 5 °C temperature at the super heater outlet considering feed water and temperature at economizer inlet as 170°C. The steam pressure and temperature at the inlet to the turbine shall be 64 kg/cm2 pressure and 445 ± 5°C.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Suryaa Chamball Power Limited (Private entity)	No
Australia	WeAct Pty Ltd. (Private entity)	No

A.5. Public funding of project activity

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The project has not received any public funding or Official Development Assistance (ODA) from an Annex I party.

A.6. History of project activity

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This is a registered CDM project activity (Ref ID: 0347). Project activity has successfully completed its first crediting period & going to complete its second crediting period on 29th Feb 2020. The Project Participant is hereby submitting request for third renewal of crediting period in line with the Project Cycle Procedure para 279.

A.7. Debundling

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According to para 130 of Project Standard & tool for "Assessment of de-bundling for small-scale project activities";

A proposed small-scale project activity shall be deemed to be a de-bundled 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:

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

Note: As explained in section A.6 that project activity is a registered small-scale project activity and currently requesting for its third renewable of crediting period. Nevertheless, according to above-mentioned points of de-bundling, SCPL's project activity is not a part of any of the above, so it should be considered as small scale CDM project activity.

SECTION B. Application of selected methodologies and standardized baselines

B.1. Reference to methodologies and standardized baselines

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Methodology: “Grid connected renewable electricity generation” AMS-I.D. Version 18.

Tool:
“Tool to calculate the emission factor for an electricity system, version 07”
“Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, version 03”

Reference: https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

B.2. Applicability of methodologies and standardized baselines

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The project activity involves generation of grid connected electricity from the renewable biomass - based power generation project and a Greenfield project activity. The project activity is having 7.5 MW installed capacity; therefore, falls in small scale project activity and eligible under small scale methodology AMS-I.D. The project status corresponding to the methodology AMS-I.D. Version 18 and applicability of methodology is discussed below:

<table>
<tr><th>S. No</th><th>Applicability Criteria for AMS-I.D. Version 18</th><th>Justification</th></tr>
<tr><td>1.</td><td>This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:
a. Supplying electricity to a national or a regional grid; or
b. Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</td><td>The project comprises of renewable biomass-based electricity generation unit which will supply electricity to a regional grid on a contractual agreement signed with the state electricity board and thus satisfies the criteria. Hence, project activity satisfies this applicability criterion 1.a.</td></tr>
<tr><td>2.</td><td>Illustration of respective situations under which each of the methodology (i.e. “AMS-I.D.: Grid connected renewable electricity generation”, “AMS-I.F.: Renewable electricity generation for captive use and mini-grid” and “AMS-I.A.: Electricity generation by the user) applies is included in the appendix.
<table>
<tr><th>S.No</th><th>Project Type</th><th>AMS-I.A.</th><th>AMS-I.D.</th><th>AMS-I.F.</th></tr>
<tr><td>1</td><td>Project supplies electricity to a national/regional grid</td><td></td><td>X</td><td></td></tr>
<tr><td>2</td><td>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</td><td></td><td></td><td></td></tr>
</table>
</td><td>As per Table 1 of AMS-I.D ver 18, the proposed project activity fall under project type 1 i.e. project supplies electricity to a national/regional grid. Hence, project activity satisfies this applicability criterion</td></tr>
</table>

		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 grid1 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			
3.	This methodology is applicable to project activities that: a. Install a Greenfield plant b. Involve a capacity addition in (an) existing plant(s); c. Involve a retrofit of (an) existing plant(s); d. Involve a rehabilitation of (an) existing plant(s)/unit(s); or e. Involve a replacement of (an) existing plant(s).				The project activity installs a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. Hence, the proposed project activity is a Greenfield plant and satisfies this condition.
4.	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2; c. 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 criterion is not applicable to the project activity as the proposed project is a biomass project.
5.	If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires				The project activity involves the installation of a turbine generator with an installed capacity of 7.5 MW based on the renewable biomass and hence is within the 15 MW limit set by the

	fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	methodology.
6.	Combined heat and power (co-generation) systems are not eligible under this category.	The project is not a combined heat and power plant and hence this criterion is not applicable.
7.	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project is a Greenfield project as there is no addition to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.
8.	In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The project is a Greenfield project as there is no any retrofit or replacement to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.
9.	In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.	The project activity involves the installation of a turbine generator with an installed capacity of 7.5 MW based on the renewable biomass. Hence, this criterion is not applicable.
10.	In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	Project activity is not based on the biomass sourced from the dedicated plantations. Hence, this criterion is not applicable.

As the project adheres to all the applicability conditions of the methodology, the use of AMS I.D is justified.

Tool to calculate the emission factor for an electricity system - Version 07.0:

Applicability Criterion	Project Case
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project is a grid connected biomass-based power project and thus the tool is applicable.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option II.a and option II.b. If option II.a is chosen, the conditions specified in “Appendix 2: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total	Steps involved in calculation of Emission Factor are included in section B.6.1 of the PDD as per the requirement of the tool.

capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project is located in non-Annex I country and hence the tool is applicable.
Under this tool, the value applied to the CO_2 emission factor of bio fuels is zero.	The project is a biomass-based Power Project and there is no involvement of bio fuels.

B.3. Project boundary, sources and greenhouse gases (GHGs)

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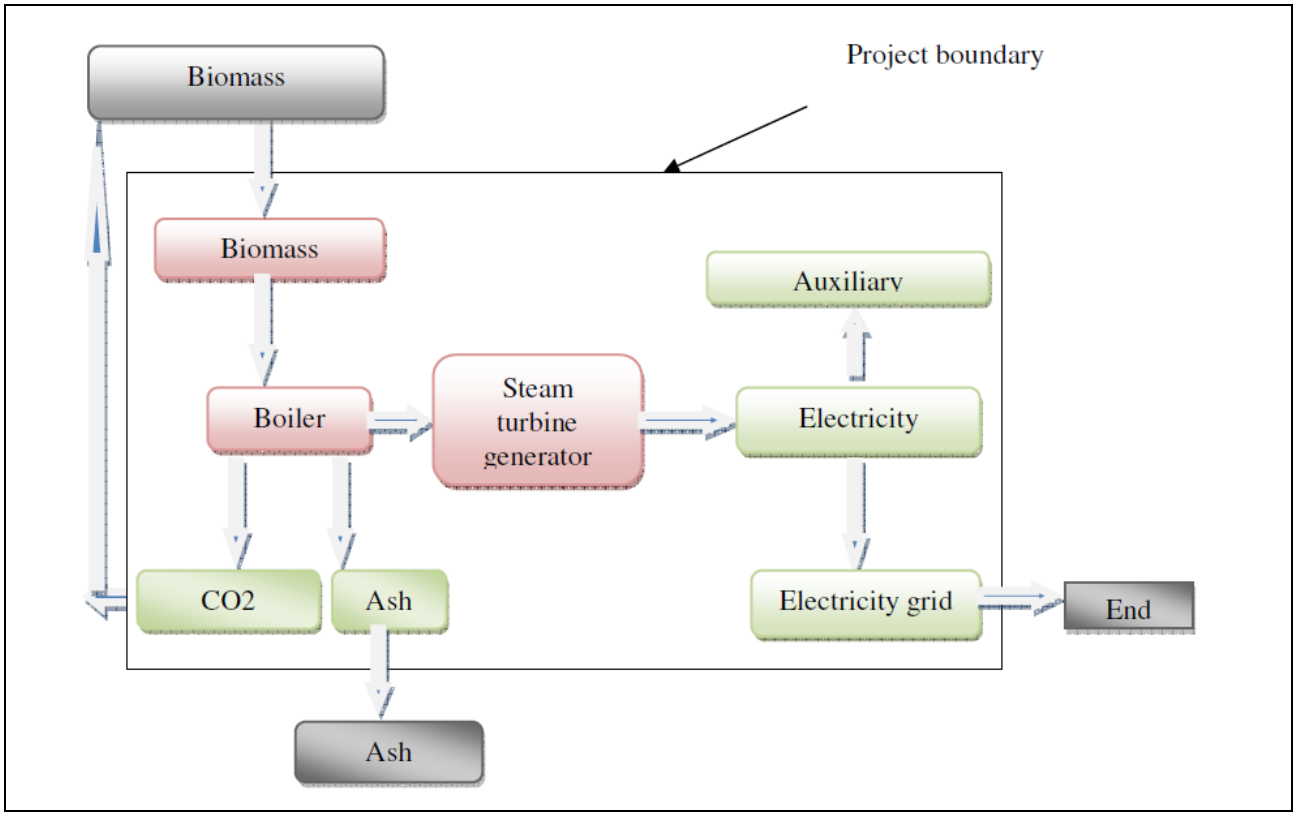
As per AMS-I.D. version 18 para 18, "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to."

The project boundary is therefore the physical boundary, which includes the area from where biomass is procured and stored, the boiler, turbine system and transmission system till the evacuation point. The electricity would be exported to the regional grid which is integral part of Indian grid. Hence for the purpose of baseline calculation, Indian grid is included in the project boundary.



The baseline study of Indian grid shows that the main sources of GHG emissions in the baseline are CO_2 emissions from the conventional power generating systems, the other emissions are that of CH_4 and N_2O but both emissions were conservative and are excluded for simplification of the

project. The project activity is the emission free electricity generation from renewable sources and hence emits no gases in the atmosphere.

Following table indicates the sources and gases included in the project boundary:

	Source	GHG	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	CO_2	Yes	In the baseline scenario the electricity would have been sourced from the Indian grid which in turn would be connected to fossil fuel fired power plants which emit CO_2.
		CH_4	No	No methane generation is expected to be emitted.
		N_2O	No	No nitrous oxide generation is expected to be emitted.
Project activity	Greenfield biomass based power generation project activity	CO_2	No	The project activity does not emit any emissions.
		CH_4	No	No methane generation is expected to be emitted.
		N_2O	No	No nitrous oxide generation is expected to be emitted.

B.4. Establishment and description of baseline scenario

>>

The project activity is feeding power to RRVPNL, the baseline for this project activity is a function of the generation mix of Indian regional grid. Using the methodology available for small scale project activities, the average of operating and build margin (in $kgCO_2e/kWh$) of current generation mix of Indian region is used for the calculation of baseline. Actual CO_2 emission factors are used for the purpose.

The project activity comprises the installation of a 7.5 MW turbine generator that generates electricity by combusting mustard residues and other agro wastes and the generated electricity is then supplied to the grid. This generated electricity would otherwise have been supplied by at least one fossil fuel fired unit connected to the grid.

The project activities meet the conditions of paragraph 18, of the applied methodology which states that —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".

Baseline scenario for the third crediting period has been assessed in line with the methodological tool **"Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period."** Version 03.0.1.

This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 300 of Project Standard & 49 (a) of the modalities and procedures of the Clean Development Mechanism.

The tool stipulates the following steps to be carried out.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

There is no legal and regulatory requirement that mandates the production of energy by the chosen technology. Investment in biomass energy projects in the State of Rajasthan and the

regional electricity grid is not mandatory. There are no national or local laws or regulations that require this investment to be undertaken, i.e. setting up of biomass power project. The setting up of biomass energy projects is a voluntary activity. Baseline for the project activity is in compliance with relevant mandatory national and sectoral policies.

Hence, it remains unchanged in the current situation also, i.e. in the 3rd crediting period.

Step 1.2: Assess the impact of circumstances
The baseline scenario identified at the validation of the project activity was grid i.e. the electricity delivered to the grid by the project activity which would have otherwise been taken directly from grid where power is generated predominantly by the operation of fossil fuel based power (which was also evident from the Combined Margin Emission factor calculated and detailed in the registered PDD). The baseline scenario for the project activity in the current context remains same i.e. grid and the grid still supplies primarily fossil fuel based electricity as reflected in the Combined Margin emission factor.

Hence, circumstances and the externalities for determining the baseline for the project activity are same. **Therefore, there is no change in baseline scenario for the last crediting period.**

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) **or an investment is the most likely scenario for the crediting period for which renewal is requested**

This sub-step has to be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment. The project activity is a Greenfield activity. Since this is not the case with the project activity under consideration, hence this condition is not applicable.

Step 1.4: Assessment of the validity of the data and parameters
This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the project activity.”

In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor

Step 2: Update the current baseline and the data and parameters
As evident from the explanation provided above the baseline scenario remains unchanged. Only the approach used to calculate the baseline emission factor is updated as per the latest version of CEA database available at the time of PDD submission for renewal.

The approved consolidated baseline methodology, AMS-I.D, (Version 18), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology “Tool to calculate the emission factor for an electricity system” (version 07.0) has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

The details of CM Emission Factor calculation are reported under the Section B.6.1 of this PDD.

It is evident from below table that the installed capacity in the Indian Grid is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO_2 emissions in the country by way of fuel substitution, increased use of renewable energy sources, and also by improving the thermal efficiency of power generation.

Source: CEA Database Version 14

Table 1: Sector- wise installed capacity (MW) as on 31.03.2018

Sector	Thermal				Nuclear	Hydro	RES	Total
	Coal	Gas	Diesel	Total				
State	64670.50	7078.95	363.93	72113.38	0.00	29858.00	2003.37	103974.75
Central	56955.00	7237.91	0.00	64192.91	6780.00	12041.42	1502.30	84516.63
Private	75546.00	10580.60	473.70	86600.30	0.00	3394.00	65516.72	155511.02
All India	197171.50	24897.46	837.63	222906.59	6780.00	45293.42	69022.39	344002.39

In line with the "Tool to calculate the emission factor for an electricity system" - The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 25%) and build margin (BM) (having weightage 75%). Calculations for this combined margin must be based on data from an official source (where available) and made publically available. Therefore, latest CEA database version 14[4] is used to evaluate the emission factor for the project activity.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,y}$	0.8885 tCO_2e/MWh	Combined margin CO_2 emission factor for the project electricity system in year y	Calculated as the weighted -average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO_2 Emission Database, Version 14 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9610 tCO_2e/MWh	Operating margin CO_2 emission factor for the project electricity system in year y	Calculated as the last 3 year (2015-16, 2016-17 & 2017-18) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 14, published by Central Electricity Authority (CEA), Government of India
$EF_{grid,BM,y}$	0.8600 tCO_2e/MWh	Build margin CO_2 emission factor for the project electricity system in year y	2nd Crediting Period Registered PDD Build Margin Value is used in compliance to Para 72 of "Tool 7: which states that - For the third crediting period, the build margin emission factor calculated for the second crediting period should be used."

[44] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

B.5. Demonstration of additionality

>>

As explained in section A.1 of the PDD, project participant is requesting for the renewal of third crediting period.

In accordance with the CDM Project Standard para 280, ***"For renewal of crediting period of a registered CDM project activity, the project participants are not required to reassess the additionality of the project activity nor update the section of the PDD relating to additionality."***

The project additionality has been demonstrated and established under the registered PDD. The section B.5 of the registered PDD version 05.2, dated 27th Feb 2013, has demonstrated additionality using the relevant guidelines which confirms that project activity is additional.

However, regulatory surplus shall be demonstrated, and the project description shall be updated accordingly".

"The project shall not be mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework. For UNFCCC non-Annex I countries, laws, statutes, regulatory frameworks or policies implemented since 11 November 2001 that give comparative advantage to less emissions intensive technologies or activities relative to more emissions-intensive technologies or activities need not be taken into account. For all countries, laws, statutes, regulatory frameworks or policies implemented since 11 December 1997 that give comparative advantage to more emissions-intensive technologies or activities relative to less emissions-intensive technologies or activities shall not be taken into account."

As per the registered PDD, section B.5, "There is no legal or regulatory requirement for the project activity considered. Hence any enforced law, statute or other regulatory framework, cannot mandate the project. "At current scenario also the project activity is not a legal or regulatory requirement. Thus, project activity is additional.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

>>

Baseline emissions include only CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$\mathbf{BE_y} = \mathbf{EG_{PJ,y}} \times \mathbf{EF_{grid,y}} \quad \text{……. (1)}$$

Where:

$\mathbf{BE_y}$ = Baseline emissions in year *y* (tCO_2e)

$\mathbf{EG_{PJ,y}}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh)

$\mathbf{EF_{grid,y}}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2e/MWh)

The methodology provides following approaches for emission factor calculations:

(a) Combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology "Tool to calculate the emission factor for an electricity system".

OR

(b) The weighted average emissions (in tCO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Option (a) has been considered to calculate the grid emission factor as per the 'Tool to calculate the emission factor for an electricity system' since data is available from an official source.

CO_2 Baseline Database for the Indian Power Sector, Version 14, published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per *Methodological tool: Tool to calculate the emission factor for an electricity system* (Version 07), following six steps have been followed:

Step 1: Identify the relevant electricity systems;
Step 2: Choose whether to include off-grid power plants in the project electricity system (optional);
Step 3: Select a method to determine the operating margin (OM);
Step 4: Calculate the operating margin emission factor according to the selected method;
Step 5: Calculate the build margin (BM) emission factor;
Step 6: Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems
As described in tool "For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems." It also 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." Keeping this into consideration, the Central Electricity Authority (CEA), Government of India has divided the Indian Power Sector into five regional grids viz. Northern, Eastern, Western, North-eastern and Southern. However, all the 5 zones have now been synchronized and called as Indian Grid.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)
Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I:
Only grid power plants are included in the calculation.

Option II:
Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant has chosen only grid power plants in the calculation.

Step 3: Select a method to determine the operating margin (OM)
The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

The data required to calculate Simple adjusted OM and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on generation of electricity from low-cost/ must-run sources. In the context of the methodology low cost/must-run resources typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

The CEA database 2018 clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50% of the total generation. Thus, the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

a. **Ex ante option:** if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

OR

b. **Ex post option:** if the ex-post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has chosen ex-ante option for calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the VCS-PD to the VCS registry for listing.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

Step 4: Calculate the operating margin emission factor ($EF_{grid,OM\ Simple,y}$) according to the selected method

The operating margin emission factor has been calculated using a 3-year data vintage:

Net Generation in Operating Margin (MWh) (incl. imports)		
2015-16	**2016-17**	**2017-18**
871,753,243	916,277,834	9,60,692.882

Simple Operating Margin Emission Factors (tCO2/MWh) (incl. Imports)		
2015-16	**2016-17**	**2017-18**
0.97	0.96	0.95

Weighted Generation Operating Margin (tCO2/MWh)	0.9610

Step 5: Calculate the build margin (BM) emission factor ($EF_{grid,BM,y}$)
As per Methodological tool: “Tool to calculate the emission factor for an electricity system” (Version 07.0):

In terms of vintage of data, project participants can choose between one of the following two options:

(a) ***Option 1*** *- for the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.*

(b) ***Option 2*** *- For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex-ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.*

In both Option 1 & 2, it is stated that "For the third crediting period, the build margin emission factor calculated for the second crediting period should be used." Hence, BM calculated in second crediting period is used for the calculation of combined margin emission factor calculation in the third crediting period.

Build Margin (tCO_2/MWh)	
	IInd CP - BM
Indian Grid	**0.8600**

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)
As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version - 7)

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:
(a) Weighted average CM; or
(b) Simplified CM.

PP has chosen option (a) i.e., weighted average CM to calculate the combined margin emission factor for the project activity.

The combined margin emissions factor is calculated as follows:

$EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2e/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y* (tCO_2e/MWh)

w_{OM} = Weighting of operating margin emissions factor (per cent)

w_{BM} = Weighting of build margin emissions factor (per cent)

The following default values should be used for W_{OM} and W_{BM}:

a. Wind and solar power generation project activities: wOM = 0.75 and wBM = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;

b. All other projects: W_{OM} = 0.5 and W_{BM} = 0.5 for the first crediting period, and W_{OM} = 0.25 and W_{BM} = 0.75 for the second and **third crediting period**, unless otherwise specified in the approved methodology which refers to this tool.

Project activity satisfies the option b (W_{OM} = 0.25 and W_{BM} = 0.75 for the second and **third crediting period**.)

Therefore, $EF_{grid,CM,y}$ = 0.9610*0.25 + 0.8600*0.75
= **0.88525** t CO_2e/MWh

Baseline emission factor (EF_y) :

The baseline emission factor is calculated using the combined margin approach as described in Step 6 above:

Therefore, $EF_{grid,y}$ = $EF_{grid,CM,y}$ = **0.88525** t CO_2e/MWh.

Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh):

The quantity of electricity generated is equal to the difference between gross electricity generated and the electricity used for auxiliary consumption and is based on factors such as installed capacity, operating days and the plant load factor (PLF). It is initially assumed that the 7.5 MW plant will operate at 85% PLF. Therefore, for the calculation of baseline emission PP has considered 85% PLF.

Hence, $EG_{pj,y}$ which is given as:

$EG_{BL,y} = EG_{export} - EG_{import}$ ……(2)

Where:
EG_{export} - Electricity exported due to the project activity in the year y, MWh

EG_{import} - Electricity imported due to the project activity in the year y, MWh

Now,

$EG_{export} = EG_{gross} - EG_{aux}$ …….(3)

Where:
EG_{gross} - Gross electricity generated due to the project activity in the year y, MWh

EG_{aux} - Auxiliary consumption due to the project activity in the year y, MWh

Using the fixed carbon dioxide emissions factor determined in this section, this equation may be simplified to the following:

$BE_y = EG_{PJ,y} \times EF_{grid,y}$ .....(4)
= $EG_{PJ,y}$ (MWh) X **0.88525** (t CO_2e/MWh)

Project Emissions:

Project emission due to coal or any fossil fuel consumption: as per para 40 of the applied methodology used says, "CO_2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". The project activity will be using fossil fuel like coal and lignite as alternate fuel to meet the emergency requirements of the power house; hence emissions due to usage of fossil fuel will be accounted as project emissions. As per the latest guidelines of Government of Rajasthan, 15% of conventional fossil fuel can be used in case of any emergency.

CO_2 emissions from fossil fuel combustion in the project activity are calculated based on the quantity of fuels combusted and the CO_2 emission coefficient of those fuels, as follows:

$$PE_{FC,J,y} = \sum_i FC_{i,j,y} \times COEF_{i,y} \quad \text{…….(5)}$$

Where:

$PE_{FC,J,y}$ - Are the CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2e/yr);

$FC_{i,j,y}$ - Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)

$COEF_{i,y}$ - Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)

i - Are the fuel types combusted in process *j* during the year *y*

As per the tool the CO_2 emission coefficient $COEF_{i,y}$ can be calculated using one of the following two Options, depending on the availability of data on the fossil fuel type i, as follows:

The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on the chemical composition of the fossil fuel type i,

Or

The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO_2 emission factor of the fuel type i,

We used the second option due to easy availability of the data required for it which is calculated as:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y} \quad \text{.....(6)}$$

Where:

$NCV_{i,y}$ - Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)

$EF_{CO2,i,y}$ - Is the weighted average CO_2 emission factor of fuel type i in year y (tCO_2e/GJ)

i - Are the fuel types combusted in process j during the year y

In the 1st & 2nd crediting period PDD, the project emission was considered to be zero, as there was no consumption of conventional fuel. Therefore, for the third crediting period the project emission will be considered zero for renewal. Although at the time of verification as per the monitoring procedure the project emission will be considered and on the basis of same total emission reduction will be calculated.

Leakage:
With reference to the latest methodology applicable para 42, "General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues." Also, the tool "Leakage in biomass small-scale project activities" version 4 has been considered to identify the leakage associated with the projects if any.

As per the para 23 of the tool "Leakage in biomass small-scale project activities" version 4, under "Competing uses for the biomass" category – *"The project participant shall evaluate ex-ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions."*

In order to assess the availability of biomass in the project region, a biomass availability survey has been conducted by a credible third party agent. Based on the biomass availability survey report it has been confirmed that there is sufficient biomass available in the region less than 50 km surrounding the site of the project activity. It confirms that there is no such leakage anticipated. The biomass availability survey report has been submitted to DOE for verification.

Availability of biomass:

As per the third party certified biomass availability report assessment[5], it was found that, on an average of about 1,24,64,714 MT per year of biomass was generated. 91,99,500 MT per year of the biomass generated from agricultural activity goes for consumption in local for fodder, manure, fuel for thermal energy consuming industries including the project activity, biomass power plants, brick kiln, etc, and about 32,65,213 MT per year is available for other activities or exported to nearby states.

Table 6 District-wise Average Generation Consumption & Surplus Biomass in Rajasthan

Sr. No.	Districts	Generation Tons/Year	Consumption Tons/Year	Surplus Tons/Year
1	Kota	4807716.6	2644244.15	2163472.483
2	Baran	4062542	3859414.94	203127.1019
3	Bundi	3594455.3	2695841.5	898613.8329
TOTAL		**12464714**	**9199500.58**	**3265213.418**

Source: *Biomass consumption arrived from primary data (the primary data collected at field level by discussion with farmers, local people, biomass and food grain traders, other biomass consuming industries and personal observation by the field enumerators). Surplus biomass calculated from biomass generation and consumption.*

The capacity of power plant based on 100% biomass (Mustard Husk, JuliFlora etc.) at 50% collection efficiency is 7.5 MW. It can be concluded from the merit order that Mustard Husk, JuliFlora, Soya Husk, wood chips and baggase are the attractive fuels for the proposed power plant. Due to abundant availability of Mustard Husk, JuliFlora, Baggase, Wood chips, leaf cuttings etc. no fuel shortage is expected.

Quantity of available biomass in the region =

[5] Please refer page 15 of biomass availability report.

(Available Surplus biomass X 100%) / (Total Biomass consumption in the area (0 - 50 km) including the project activity)

= 32,65,213 X 100% / 124,64,714
= 26.20% (Which above 25%)

Thus, it can be concluded that available biomass quantity in the region "*is at least 25% larger than the quantity of biomass that is utilised including the project activity".*

Extracts from Biomass availability report provides better understanding about the production and consumption pattern in the project area:

Table 2 Area and Production of Kharif and Rabi crops in Rajasthan

CROPS / Financial Year	Area in Lakh Hectares			Production in Lakh Tons		
	FY 2015-16	FY 2016-17	FY 2017-18	FY 2015-16	FY 2016-17	FY 2017-18
(A) Cereals	91.50	94.86	90.81	162.97	196.87	190.52
Kharif	57.82	58.57	58.07	50.93	63.43	70.53
Rabi	33.68	36.29	32.74	112.04	133.44	119.99
(B) Pulses	38.67	57.45	57.80	19.90	34.17	35.30
Kharif	28.31	41.00	42.40	10.47	18.77	18.94
Rabi	10.36	16.45	15.40	9.43	15.40	16.36
(A+B) Food Grains	130.17	152.31	148.61	182.87	231.04	225.82
Kharif	86.13	99.57	100.47	61.40	82.20	89.47
Rabi	44.04	52.74	48.14	121.47	148.84	136.35
(C) Oil Seeds	48.43	48.11	40.99	55.11	65.12	57.44
Kharif	22.84	20.21	18.94	22.44	25.56	24.23
Rabi	25.59	27.90	22.05	36.67	39.56	33.21
(D) Sugar	0.06	0.07	0.05	5.31	4.89	4.04
(E) Cotton	4.48	4.71	5.84	12.14	15.60	17.28

Note : Production in Lakh bales (each bale of 170 kg) Source: Rajasthan Economic Review 2017-18

As per preliminary forecast for the year FY 2019-20, the total food grain production in the State is expected to be 550 lakh tonnes, which is showing an increase as compared to the production of 531.04 lakh tonnes during the year 2017-18.

Crop residue forms the major portion of the biomass generation. The main crop residues of the study area are:

Table 3 Biomass Generation – Crop Residue

Sr. No.	Crops	Biomass
1	Paddy	Paddy Straw
2	Jowar	Jowar Stalks
3	Bajra	Bajra Stalks
4	Maize	Maize Stalks
5	Moong	Moong Stalks
6	Urad	Urad Stalks
7	Moth	Moth Stalks
8	Seasamum	Seasamum Stalks
9	Ground Nut	Ground Nut Stalks
10	Soya Bean	Soya Bean Stalks
11	Castor	Castor Stem
12	Cotton	Cotton Stalks
13	Guar	Guar Stalks
14	Wheat	Wheat Stalks
15	Barley	Barley Stalks
16	Gram/Soyabean	Gram/Soyabean Stalks
17	Mustard	Mustard Stalks & Husk
Prosopis Juliflora – Grown in Wasteland and Forestland		
18	Prosopis Juliflora	Prosopic Juliflora Wood

Table 4 Biomass Residue Generation in Tons per Ha per year in Rajasthan

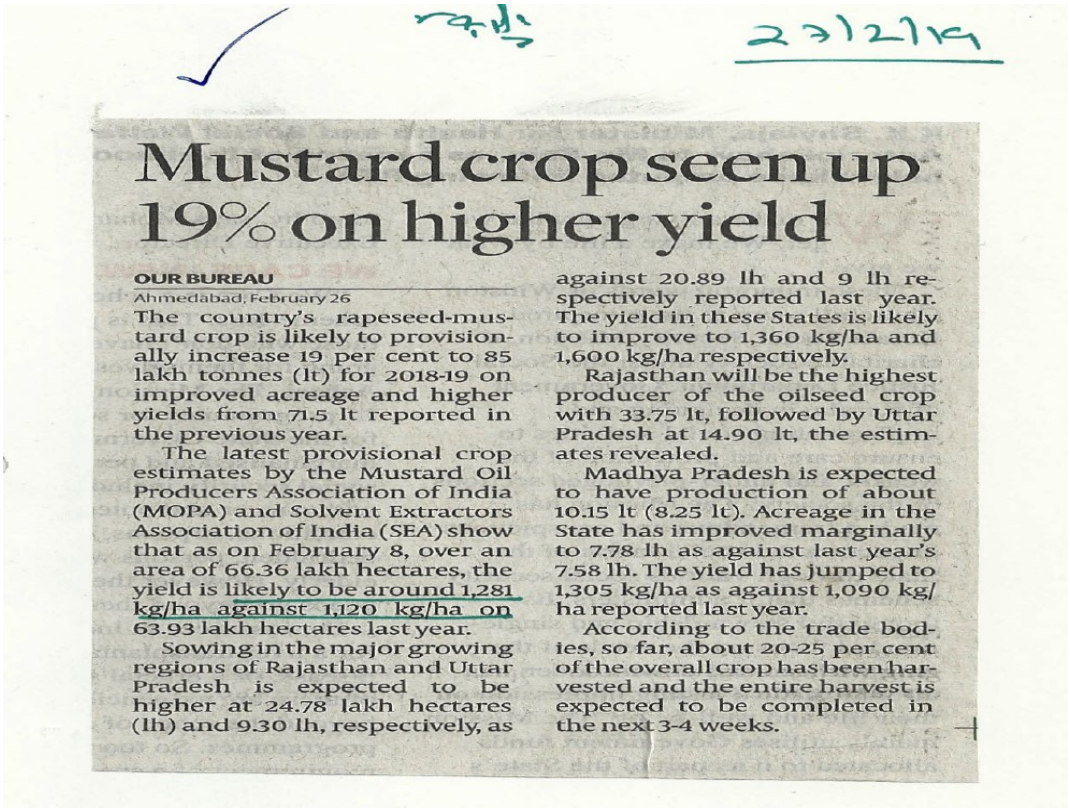
Sr. No	Crops	Biomass	Average Yield	CRR
1	Paddy	Paddy Straw	1.601	1.7
2	Jowar	Jowar Stalks	0.716	2.4
3	Bajra	Bajra Stalks	1.149	2.63
4	Maize	Maize Stalks	1.407	2.3
5	Moong	Moong Stalks	0.496	1.25
6	Urad	Urad Stalks	0.430	1.3
7	Moth	Moth Stalks	0.275	1.8
8	Seasamum	Seasamum Stalks	0.324	1.5
9	Ground Nut	Ground Nut Stalks	1.749	2.3
10	Soya Bean	Soya Bean Stalks	0.524	1.7
11	Castor	Castor Stem	0.789	4
12	Cotton	Cotton Stalks	0.486	3.8
13	Guar	Guar Stalks	0.693	1.8
14	Wheat	Wheat Stalks	3.456	1.5
15	Barley	Barley Stalks	2.903	1.3
16	Gram	Gram Stalks	1.129	1.1
17	Mustard	Mustard Stalks & Husk	1.233	1.8

Source: Indian Institute of Science (IISc.) Bengaluru

Table 5 Biomass Generations from Agricultural Activity in Rajasthan

Sr. No	Crops	Biomass	Biomass Generated Tons / Year
1	Paddy	Paddy Straw	1,68,465
2	Jowar	Jowar Stalks	1,17,139
3	Bajra	Bajra Stalks	1,15,07,04
4	Maize	Maize Stalks	9,87,233
5	Moong	Moong Stalks	1,73,948
6	Urad	Urad Stalks	91,774
7	Moth	Moth Stalks	1,89,945
8	Seasamum	Seasamum Stalks	1,02,488
9	Ground Nut	Ground Nut Stalks	9,93,248
10	Soya Bean	Soya Bean Stalks	10,88,564
11	Castor	Castor Stem	0,19,661
12	Cotton	Cotton Stalks	3,55,652
13	Guar	Guar Stalks	9,77,206
14	Wheat	Wheat Stalks	10,13,418
15	Barley	Barley Stalks	9,64,140
16	Gram	Gram Stalks	9,25,063
17	Mustard	Mustard Stalks & Husk	31,46,066
Total			**1,24.64,714**

Biomass Generation from Agricultural Activity = 1,24.64,714 tons/year.



Mustard crop seen up 19% on higher yield

OUR BUREAU
Ahmedabad, February 26

The country's rapeseed-mustard crop is likely to provisionally increase 19 per cent to 85 lakh tonnes (lt) for 2018-19 on improved acreage and higher yields from 71.5 lt reported in the previous year.

The latest provisional crop estimates by the Mustard Oil Producers Association of India (MOPA) and Solvent Extractors Association of India (SEA) show that as on February 8, over an area of 66.36 lakh hectares, the yield is likely to be around 1,281 kg/ha against 1,120 kg/ha on 63.93 lakh hectares last year.

Sowing in the major growing regions of Rajasthan and Uttar Pradesh is expected to be higher at 24.78 lakh hectares (lh) and 9.30 lh, respectively, as against 20.89 lh and 9 lh respectively reported last year. The yield in these States is likely to improve to 1,360 kg/ha and 1,600 kg/ha respectively.

Rajasthan will be the highest producer of the oilseed crop with 33.75 lt, followed by Uttar Pradesh at 14.90 lt, the estimates revealed.

Madhya Pradesh is expected to have production of about 10.15 lt (8.25 lt). Acreage in the State has improved marginally to 7.78 lh as against last year's 7.58 lh. The yield has jumped to 1,305 kg/ha as against 1,090 kg/ha reported last year.

According to the trade bodies, so far, about 20-25 per cent of the overall crop has been harvested and the entire harvest is expected to be completed in the next 3-4 weeks.

The biomass consumption as explained as under

Table 9 Biomass consumption in catchment area

Districts	Consumption	Unit	Consumption Up to 50 Km including annual consumption of project
Wheat residue	Fodder	%	91.87%
Paddy Husk	Industrial fuel	%	95%
Rice husk	Raw material for paper mills/ agro-industries and very minimum used as fodder	%	25%
Bagasse	Fuel in sugar mills	%	95%
Cane top & trash	Tops-Used as fodder/ thatching	%	25%
Cotton Stick	Domestic fuel	%	60%
Mustard residue	Husk is use for brick kiln & straw is use as domestic fuel	%	70%
Bajara residue	Cattle feed	%	100%

Total biomass consumption of the catchment area including the biomass consumption of the 7.5 MW project is estimated to be **91,99,500.58** MT/Annum which estimate the overall consumption from Fodder, Domestic and Industrial Fuel etc.

Hence, it can be concluded that there is surplus biomass available in the state of Rajasthan.

However, as per the clarification provided by the SSC WG, emissions related to transport of biomass are not being considered as these are transported over a distance of less than 200 kilometres. And the biomass availability is within the permissible transportable distance i.e. under 50 km radius.

PP has demonstrated that quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity. Hence, considering that the biomass requirement for the project is small and there is sufficient biomass available less than 50 km surrounding the site of the project activity, no such leakage is anticipated.

Therefore,
LEy = 0 ……..(7)

In the 1st crediting period PP has considered leakage due to transportation of biomass from its production site to the project site. And in the first crediting period the amount of leakage calculated was less than 10% of the total project emission reduction. Therefore, with the above-mentioned scenarios PP has not considered leakage in the 2nd crediting period and continuing the same approach in third crediting period as well.

Emission Reductions
The emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$

B.6.2. Data and parameters fixed ex ante

Data/Parameter	$EF_{OM,y}$
Data unit	tCO_2e/MWh
Description	Operating Margin for the Indian grid[6]
Source of data	CO_2 baseline database for the Indian power Sector, Central Electricity Authority, India (Version 14)
Value(s) applied	0.9610
Choice of data or measurement methods and procedures	Tool to calculate emission factor has been used to calculate the Operating Margin emission factor based on the data published by Indian power Sector, Central Electricity Authority, India.
Purpose of data	Baseline emissions calculations
Additional comment	This has been fixed ex-ante for third crediting period.

Data/Parameter	$EF_{BM,y}$
Data unit	tCO_2e/MWh
Description	Build Margin for the Indian grid
Source of data	The build margin emission factor calculated for the second crediting period in the registered PDD of 2nd Crediting Period.
Value(s) applied	0.8600
Choice of data or measurement methods and procedures	EB 100 Annex 4: Tool to calculate emission factor para 72 states that "For the third crediting period, the build margin emission factor calculated for the second crediting period should be used."
Purpose of data	Baseline emissions calculations
Additional comment	This has been fixed ex-ante for third crediting period.

Data/Parameter	$EF_{grid,y} = EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	Combined Margin Emission Factor used for the project activity for the Indian grid
Source of data	CO2 baseline database for the Indian power Sector, Central Electricity Authority, India (Version 14) and 2nd Crediting Period registered PDD.
Value(s) applied	0.88525
Choice of data or measurement methods and procedures	Tool to calculate emission factor has been used to calculate the Operating Margin emission factor based on the data published by Indian power Sector, Central Electricity Authority, India.
Purpose of data	Baseline emissions calculations
Additional comment	This has been fixed ex-ante for third crediting period.

[6] As per CEA database version 14 (released in Dec 2018), in previous years the Indian electricity system was divided into two grids, the NEWNE and Southern Grid (SR), which are now integrated as a single 'Indian Grid' covering all the states. (http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf)

B.6.3. Ex ante calculation of emission reductions

>>

From section B.6.1 putting the respective values, the emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$

Based on equation 3 from section B.6.1, EG_{gross} of 7.5 MW is 55,845 MWh and after considering 10% auxiliary consumption and the net electricity import

$EG_{BL,y}$ = 50,260.5 MWh.

$EF_{grid,y}$ fixed ex- ante as per Section B.6.2 at 0.88525 based on the CEA value for the Indian grid.

Using the value of EF_y = 0.88525 tCO_2e/MWh gives

BE_y = 44,493tCO_2e.

Project emissions

As specified and details described in section B.6.1, there might be emission due to usage of coal or lignite in case of emergency.

Leakage

It has been described above that the biomass being used by the project activity does not lead to any leakage emissions due to the surplus availability of biomass in the region considered for the project activity.

The quantity of available biomass in the region is 50% greater than the quantity of biomass residue utilized.

Therefore,

$LE_y = 0$

Emission Reductions

Emission reductions are provided by the following equation:

$ER_y = BE_y - PE_y - LE_y$

$ER_y = 44,493 - 0 - 0$

$= 44,493\ tCO_{2e}$

From the analysis above the emission reductions are calculated as 44,493 tCO_2e. Detailed calculation is provided in Emission Reduction excel sheet.

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

Year	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage (tCO_2e)	Emission reductions (tCO_2e)
Year 1	44,493	0	0	44,493
Year 2	44,493	0	0	44,493
Year 3	44,493	0	0	44,493
Year 4	44,493	0	0	44,493

Year 5	44,493	0	0	44,493
Year 6	44,493	0	0	44,493
Year 7	44,493	0	0	44,493
Total	3,11,451	0	0	3,11,451
Total number of crediting years	7			
Annual average over the crediting period	**44,493**	0	0	**44,493**

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data/Parameter	$EG_{BL,y}$
Data unit	MWh/year
Description	Quantity of net electricity supplied to the grid in year y
Source of data	Joint Meter Reading (Electronically archived)
Value(s) applied	50,260.5
Measurement methods and procedures	Monitoring equipment – Energy Meter Accuracy class - 0.2 Serial number - "RJB 89896" - Main Meter and "RJB 89897" - Check Meter Calibration frequency- Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard outgoing feeder grid interconnection point. This will be recorded every month jointly by representative officials of SCPL and the state electricity board. This record will be archived and stored.
Monitoring frequency	Data will be monitored continuously through DCS (Distribution Control System).
QA/QC procedures	The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data	Calculation of baseline emission.
Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

Data/Parameter	EG_{gross}
Data unit	MWh/year
Description	Quantity of gross electricity supplied to the grid in year y
Source of data	Log book record (manually and Electronically archived).
Value(s) applied	55,845
Measurement methods and procedures	Monitoring equipment – Energy Meter Accuracy class - 0.5 Serial number - 4223178 Calibration frequency - Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard outgoing feeder grid interconnection point. This will be recorded every month by representative officials of SCPL. This record will be archived and stored.
Monitoring frequency	Data will be monitored continuously.

QA/QC procedures	The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data	Calculation of baseline emission.
Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

Data/Parameter	EG_{aux}
Data unit	MWh/year
Description	Quantity of electricity used for auxiliary consumption in year y
Source of data	Log book record (manually and electronically archived).
Value(s) applied	10% of the gross electricity generated
Measurement methods and procedures	Monitoring equipment – Energy Meter Accuracy class - 1 Serial number - 10-05-UNI-6756 Calibration frequency - Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard . This will be recorded every month by representative officials of SCPL. This record will be archived and stored.
Monitoring frequency	Data will be monitored continuously.
QA/QC procedures	The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data	Calculation of baseline emission.
Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

Data/Parameter	EG_{import}
Data unit	MWh/year
Description	Electricity imported from the grid in year y
Source of data	Log book record (manually and Electronically archived).
Value(s) applied	0
Measurement methods and procedures	Monitoring equipment – Energy Meter Accuracy class - 0.2 Serial number - “RJB 89896” - Main Meter and “RJB 89897” - Check Meter Calibration frequency - Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard outgoing feeder grid interconnection point. This will be recorded every month jointly by representative officials of SCPL and the state electricity board. This record will be archived and stored.
Monitoring frequency	Data will be monitored continuously.
QA/QC procedures	The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data	Calculation of baseline emission.
Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

Data/Parameter	$M_{biomass,y}$
Data unit	Ton/y

Description	Quantity of biomass consumed in year y
Source of data	Load cell available on belt conveyor (Archived on paper)
Value(s) applied	257,563
Measurement methods and procedures	Monitoring equipment – load cell available on belt conveyor Type - Electronic belt conveyor/ weigher Accuracy class - 5kg Calibration frequency - Once in 2 years All the biomass is weighed at the load cell available on belt conveyor installed at the factory. The load cell is used daily to measure the exact weight of biomass purchased. And the same reading is transferred to SCPL office for the regular data record
Monitoring frequency	Monitoring of biomass will be continuous and aggregated monthly
QA/QC procedures	Internal QA/QC procedure is available at the project site and same is being followed for data monitoring and archiving.
Purpose of data	Calculation of quantity of biomass in a year.
Additional comment	The data will be kept for the later of, two years after the end of the crediting period or the last issuance of CERs for the project activity.

Data/Parameter	$W_{biomass}$
Data unit	%
Description	Moisture content of the biomass (wet basis)
Source of data	Laboratory Log Books
Value(s) applied	---
Measurement methods and procedures	The biomass residue will be tested internal SCPL laboratory by moisture testing procedure which is as follows: W1 (weight of empty dish) = x gm W2 (weight of dish + sample) = y gm The y gm sample taken in hot air oven at 110±50C for 25 to 30 minutes then it is cooled in desicator for 10 mins. W3 (weight of W2 sample after 10 minutes cooling) = z gm Therefore, Moisture (%) = $\frac{W2 - W3 \ X100}{W2 - W3}$
Monitoring frequency	-
QA/QC procedures	The procedure is cross checked against bomb calorimeter at a regular interval to get calibrated by pre-determined standard test weight method.
Purpose of data	-
Additional comment	The data will be kept for the later of, two years after the end of the crediting period or the last issuance of CERs for the project activity.

Data/Parameter	$NCV_{k,y}$
Data unit	GJ/mass or volume unit
Description	Net calorific value of biomass type k
Source of data	Laboratory record (Archived on paper)
Value(s) applied	3,121.43 (average value)

Measurement methods and procedures	Monitoring equipment – Bomb Calorimeter Accuracy class- 0.1 Serial number- 3284 Calibration frequency- Annual Date of last calibration-06/08/2018 NCV = 2332 x Temperature x 30.32/ weight of the sample 2332 = water equivalent weight 30.32 = calorific value of Nicrom wire and calorific value of cotton thread. Water equivalent = H x M x (CVt + CVw) / T Where: H = Calorific value of Benzoic acid in cal/gm M = Mass of sample in gm CV_t = calorific value of thread (per cm = 2.1 cal) CV_w = calorific value of ignition wire (per cm = 2.331 cal) T = final rise in temperature
Monitoring frequency	Monthly
QA/QC procedures	Internal QA /QC procedure are available at the project site and being followed for data monitoring and archiving.
Purpose of data	--
Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

Data/Parameter	$FC_{i,j,y}$
Data unit	Mass or volume unit/y
Description	Quantity of fossil fuel consumed in year y
Source of data	Log book maintained to record onsite consumption of diesel.
Value(s) applied	---
Measurement methods and procedures	The data will be monitored continuously and aggregated monthly.
Monitoring frequency	Daily
QA/QC procedures	Internal QA /QC procedure are available at the project site and same is being followed for data monitoring and archiving.
Purpose of data	Calculation of project emission
Additional comment	The data will be kept for the later of, two years after the end of the crediting period or the last issuance of CERs for the project activity.

Data/Parameter	$NCV_{i,y}$
Data unit	MJ per unit volume or mass unit
Description	Net calorific value of fossil fuel type i
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, Table 1.2
Value(s) applied	0.0433
Measurement methods and procedures	The net calorific value of diesel has been sourced from IPCC 2006 default value at the upper limit of the uncertainty at a 95% confidence interval and any future revision of the IPCC guidelines will be taken into account in determining the same.
Monitoring frequency	---
QA/QC procedures	Project participants have no control on the parameter. Hence, No QA/QC procedures are applicable.
Purpose of data	Calculation of project emission.

Additional comment	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

B.7.2. Sampling plan

>>
The project is located in one site and hence there is no sampling plan for the project activity.

B.7.3. Other elements of monitoring plan

>>
This monitoring plan is developed in accordance with the modalities and procedures for small-scale CDM project activities and is a grid-connected biomass based renewable energy project. The monitoring plan, is implemented by the project proponent, describes the monitoring organization, the parameters to be monitored, the monitoring practices, quality assurance, quality control procedures, data storage and data archiving.

Monitoring requirement
The monitoring plan includes monitoring of energy parameters such as

- Type and Quantity of each type of biomass fuel/fossil fuel consumption of the project activity, (tons)
- Net quantity of electricity exported by the project activity (MWh)

The Monitoring and Verification (M&V) procedures define a project-specific standard against which the project's performance (i.e. GHG reductions) and conformance with all relevant criteria will be monitored and verified. It includes developing suitable data collection methods and data interpretation techniques for monitoring and verification of GHG emissions with specific focus on technical / efficiency / performance parameters. It also allows scope for review, scrutiny and benchmarking of all this information against reports pertaining to M & V protocols.

The M&V Protocol provides a range of data measurement, estimation and collection options/techniques in each case indicating preferred options consistent with good practices to allow project managers and operational staff, auditors, and verifiers to apply the most practical and cost-effective measurement approaches to the project. The project has a clear, credible, and accurate set of monitoring, evaluation and verification of project performance procedures. The purpose of these procedures is to direct and support continuous monitoring /key project indicators to determine project outcomes, greenhouse gas (GHG) emission reductions.

The project revenue is based on the units exported as measured by power meters at plant and check meters at the high-tension substation of the RSEB. The monitoring and verification system mainly comprise of these meters as far as power export is concerned. The biomass (mustard and soya husk, corncobs, bagasse, agricultural wastes) input is also monitored. The export of electricity is through invoices to RSEB. The invoices based on a meter reading are also covered in audit.

The project employs latest state of art monitoring and control equipment that is measured, recorded, reported, monitored and control various key parameters. These monitoring and controls is part of the distributed control system (DCS) of the entire plant. All monitoring and control functions is done as per the internally accepted standards and norms of CPL.

The instrumentation system proposed for the project mostly comprises microprocessor-based instruments of reputed make with desired level of accuracy. All instruments is calibrated and marked at regular intervals so that the accuracy of measurement can be ensured all the time.

The collection of biomass (i.e. mustard husk and stalks, soya husk and stalks, corncobs & agricultural residues) will be done through farmers who will transport the biomass from their fields

to the fuel processing centres in their own vehicles (i.e. by trucks & tractors). Biomass collection centres are proposed and trucks will transport about 85% of biomass and tractors will transport the rest 15%. 70% of biomass will be collected within 5 km distance, 15% of it will be collected within 6-10 km and the rest would be collected between 11 –15 km from the project site.

However, as per the clarification provided by the SSC WG, emissions related to transport of biomass are not being considered as these are transported over a distance of less than 200 kilometres. And the biomass availability is within the permissible transportable distance i.e. under 50 km radius.

Monitoring Approach
The general monitoring principles are based on:

- Frequency
- Reliability Registration and reporting

As the emission reduction from the project is to be determined by the number of units exported to the RRVPNL (and then multiplying with appropriate emission factor), it becomes important for the project to monitor the net export of power to the grid on real time basis.

Frequency of monitoring
The project developer installed all metering and check metering facilities at switchyard within the plant premises where exported power is connected to the grid. The measurement is recorded and monitored on a continuous basis by both RRVPNL and the project developer through DCS. The project developer has no control over RRVPNL procedure and all the meter calibration & JMR preparation is solely under control of DISCOM (i.e. RRVPNL)

The amount of emission reduction is proportional to the net energy generation from the project. Thus, the final kWh meter reading is the final value from project side. All measurement devices is of microprocessor based with best accuracy and procured from reputed manufacturers and calibrated. Since the reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment to produce the result all power measuring instruments must be calibrated once a year for ensuring reliability of the system. All instruments carry tag plates, which indicate the date of calibration and the date of next calibration. Therefore the system ensures the final generation is highly reliable.

Daily, weekly and monthly reports are prepared stating the generation. In addition to the records maintained by SCPL, RRVPN also monitors the actual power exported to the grid and certify the same.

Operational Parameters of the power-generating unit
As per the small-scale methodology AMS I.D, version 18, monitoring shall consist of metering the electricity generated by the renewable technology. The generation data from the biomass plant will be continuously recorded using the electricity meters in the control room.

The total power generated by the power project is measured in the plant premises to the best accuracy and is recorded, monitored on a continuous basis through DCS. All measurement devices are microprocessor based with best accuracy and was procured from reputed manufacturers. All instruments are to be calibrated at regular intervals. All instruments carry a tag plate, which indicates the date of last calibration and the date of next calibration. The parameter substantiates the smooth operations of the power plant. During verification the total power generated would be verified as compared to the power exported to the grid.

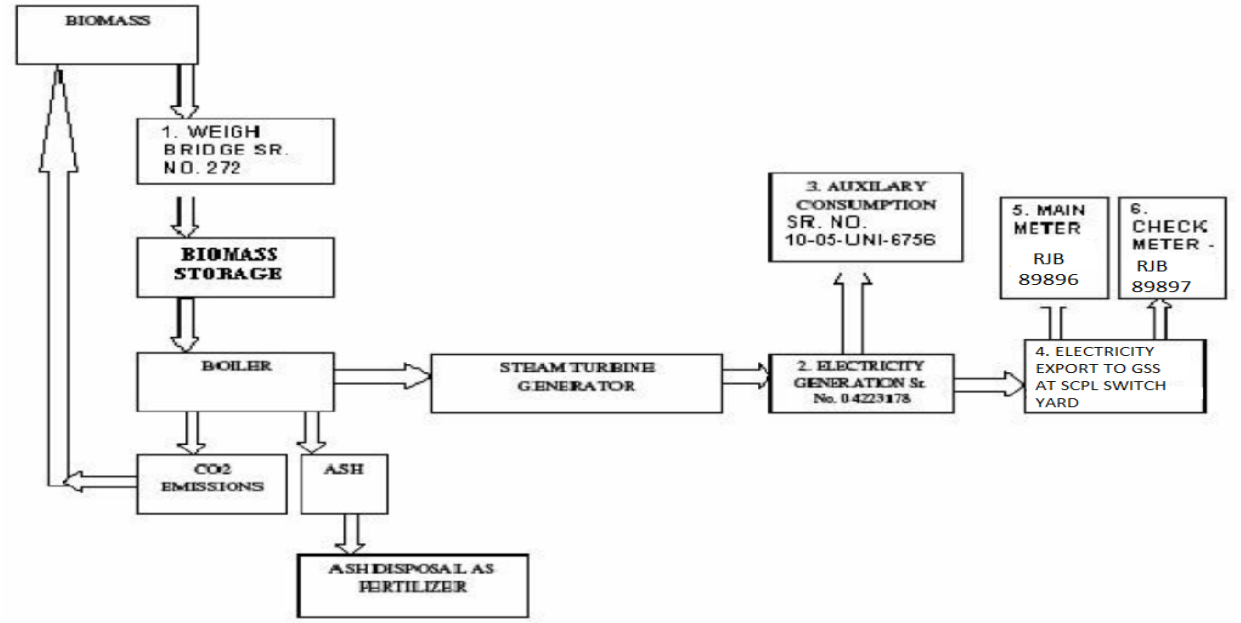
The power consumed by plant auxiliaries is recorded in the plant premises to the best accuracy. This will be recorded and monitored on a continuous basis through DCS. All measurement devices are microprocessor based with best accuracy and was procured from reputed manufacturers. All instruments will be calibrated at regular intervals.

The total quantum of power consumed by the auxiliaries would affect the total power to be exported to the grid and therefore the amount of GHG reductions. Therefore, any increase in the consumption pattern of the auxiliary system would be attended to.

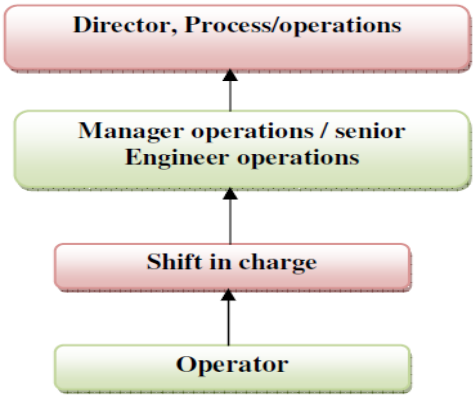
Net Power exported to the grid

The project revenue is based on the net units exported as measured by main metering system and/or backup metering system. The monitoring and verification system mainly comprises of these meters as far as power export is concerned. RRVPNL will be billed by SCPL based on joint meter reading promptly following the end of each month for energy supplied.

Details of the monitoring equipment involved in the project activity:



For the adequate monitoring of the emission reduction, SCPL has been following the structure of monitoring and reporting as under.



Role and responsibility:-

1. Director/ CEO, Process / Operations:-
   - Decision on the contents of the training program
   - Internal audit and project conformance review

2. Manager operations / senior engineer operation:-

- Organizing and conduct training program
- Implementing all monitoring control procedure
- Association with Manager QA toward maintenance and calibration of monitoring equipment
- Has the overall responsibility for record handling and maintenance
- Reviewing of records and dealing with monitoring data
- Organizing internal audit for checking the data recorded
- Has the overall responsibility for closing project non-conformance and Implementing
- Corrective actions before the verification

3. Shift In charge:-
   - Supervision and training the operators and maintaining training records
   - Has the overall responsibility of monitoring measurement and reporting
   - Will assist the Manager Operations in record handling, record checks and review during
   - Internal audit
   - Check the data recorded

4. Operator:-
   The responsibility of operator to record appropriate data of the project activities represented in the monitoring table. Based on the monitoring frequency, the operator will measure and record the data in the logbook as per the instruction of his supervisor. The operational procedures for the training, emergency preparedness, maintenance and calibration of monitoring equipment, monitoring measurements and reporting, record handling and maintenance, reviewing monitoring data, internal audit, performance reviews and corrective action are available at the plant.

General

The trained staffs are kept to ensure that the monitoring process is appropriate and effective. The CDM data are collated monthly and maintained by the Plant Manager.

The meters used are calibrated regularly as per requirements. In case, the meters are found outside the acceptable limits of accuracy or if not functioning properly, necessary action is taken and the meters are repaired or replaced immediately as per the PPA. The Instrumentation engineer will be in charge of calibrations and of maintaining the records of calibrations on site.

The project proponent keep complete and accurate records of all the data as a part of monitoring for at least a period of 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

>>
01/03/2004

C.2. Expected operational lifetime of project activity

>>
25 years[7] 0 month

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>>
Renewal crediting period

C.3.2. Start date of crediting period

>>
Starting date of the current (i.e. third) crediting period: 01/03/2020

Starting date of the first crediting period: 01/03/2006
Starting date of second crediting period: 01/03/2013

C.3.3. Duration of crediting period

>>
7 years 0 months.

[7] As per lifetime assessment for various equipment based on Companies Act under the Depreciation schedule, the technical lifetime of the project is considered by PP as more than 25 years. The Commissioning date of project activity is 31/03/2006. So, PP has considered a minimum lifetime of 25 years, thus the project plant has validity at least upto 31/03/2031.

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

As per the clearance, the assessment of environmental impact for the project activity has been carried out as required under Environmental (Protection) Act 1986, Government of India, mandatory for expansion or modernization of any activity or for setting up new projects listed in Schedule I of the notification.

Rajasthan State Pollution Control Board (RSPCB) has issued Consent to Establish (CTE) to CPL under the provisions of Water (Prevention and Control of Pollution) Act, 1974 & Air (Prevention and Control of Pollution) Act, 1981, Environment Protection Act, 1986.

The treated effluent shall confirm to the limits of the general standards prescribed under the provisions of EP act 1986 for discharge of effluent into inland surface water. Air emissions shall confirm to Emission Regulations issued by the Central Pollution Control Board (CPCB) and as adopted by the State Pollution Control Board (SPCB). The infrastructure facility for monitoring of stack emissions on each stack and flow measuring devices at each unit of effluent treatment plant shall be provided.

D.2. Environmental impact assessment

>>

As explained in section D.1, all the necessary consents relevant to the project operation has been received and PP is adhered to all the compliance of the consents.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

>>

Suryaa Chamball Power Limited (SCPL) has proposed to implement a 7.5 MW non-conventional renewable energy source (i.e. biomass) based power plant at Rangpur village, Kota district. The project proposed to use biomass like mustard and soya husk / residue / stalks, corncobs and other agricultural residues generated in the fields & located within a radius of 50 Km from the project site. The GHG emissions of the combustion process, mainly CO_2 are sequestered by mustard / soya/ corn crop plantation, representing a cyclic process. So, the project leads to zero net GHG on-site emissions. The stakeholders identified for the project are as under.

- Elected body of representatives administering the local area (village Panchayat)
- Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RRVPNL)
- Rajasthan Renewable Energy Corporation Limited (RREC)
- Rajasthan State Pollution Control Board (RSPCB)
- Ministry of Environment & Forest (MoEF), Government of India
- Ministry of Non Conventional Energy Sources (MNES)
- Non-Governmental Organizations (NGOs)
- Consultants
- Equipment Suppliers
- Biomass suppliers and farmers
- Biomass collectors

Stakeholder list includes the government and non-government parties, which are involved in the project at various stages. SCPL has not only communicated with the relevant stakeholders under statutory obligations but also has engaged the other stakeholders in a proactive manner in expressing and accounting their opinions on the project.

E.2. Summary of comments received

>>

The village Panchayat /local elected body of representatives administering the local area are a true representative of the local population in a democracy like India. Hence, their consent / permission to set up the project is necessary.

SCPL has obtained consent from the biomass collectors, suppliers and farmers and have already completed the necessary consultation and documented their approval for the project.

Local population comprises of the local people in and around the project area. The role of the local people is as a beneficiary of the project. They supply of raw material i.e., mustard husk/residue/stalks, corncobs from agricultural fields for the power plant. In addition to this, it also includes local manpower working at the plant site. Since, the project will provide good direct and indirect employment opportunities the local populace is encouraging the project.

The project has not displaced any local population. In addition, the local population is also an indirect consumer of the power that is supplied from the power plant. This is essentially because the power sold to the grid has improved the stability in the local electricity network. Since, the distance between the electrical substation for power evacuation and the plant is not very high, installation of transmission lines did not create any inconvenience to the local population. Thus, the project has not caused any adverse social impacts on local population rather has helped in improving their quality of life.

Rajasthan State Pollution Control Board (RSPCB) has prescribed standards of environmental compliance and monitors the adherence to the standards. The project has already received Consent to Establish from RSPCB to start commissioning of the plant.

Rajasthan Renewable Energy Corporation Limited (RREC) implements policies in respect of nonconventional renewable power projects in the State of Rajasthan and has accorded approval to the project. Further, State's apex body of power has already issued consent for the installation and operation of the biomass-based power plant of 7.5 MW capacity.

As a buyer of the power, the RRVPNL will be a major stakeholder in the project. They hold the key of the commercial success of the project. RRVPNL has already cleared the project and SCPL has signed the Power Purchase Agreement (PPA) with RRVPN for a period of 20 years.

The tariff will be Rs-3.6824 per kWh in the year 2004-05 and will escalate by 5% per annum on compounded basis for a period of 8 years thereafter. The tariff beyond this period will be mutually settled between RRVPNL and SCPL

The Government of India, through Ministry of Non-conventional energy Sources (MNES), has been promoting energy conservation, demand side management and viable renewable energy projects including wind, small hydro, solar and biomass power generation projects.

Projects consultants are to be involved in the project to take care of the various pre contact and post contract issues / activities like preparation of detailed project report (DPR), preparation of basic and detailed engineering documents, preparation of tender documents, selection of vendors / suppliers, supervision of project operation, implementation, successful commissioning and trial run.

Stakeholder's Comments

SCPL has received the necessary approvals and consents from various authorities prior to project implementation. The approvals include those from RSPCB, RRVPNL, Panchayat (Public and local people around Kota).

E.3. Consideration of comments received

>>

The relevant comments and important clauses mentioned in the project documents / clearances like Detailed Project Report (DPR), environmental clearance, Power Purchase Agreement (PPA), local clearances etc, were considered while preparing the CDM Project Design Document.

The SCPL representative met with the local NGOs and apprised them about the project and sought their support for the project.

As per UNFCCC requirement the PDD was put up at the validator's web site for public comments for 30 days starting 14 September to 13 October 2005. However, no comments were received.

SECTION F. Approval and authorization

>>

The links of approval and authorization of the MoEF and all the Parties involved in the project activity are as below:

Parties Involved	Reference number	Date
India (Host)[8]	4/4/2005-CCC	18th February, 2008
Australia[9]	AUSCDM0403WA_CPL	23rd October, 2015

[8] http://cdm.unfccc.int/filestorage/C/L/R/CLRRVWRWQBO565NJ04PIFHIZFZ9QRL/LOA.pdf?t=UmV8bWI2ZWhlfDCgoLptb_iwUzrhXfWT0S3V

[9] https://cdm.unfccc.int/filestorage/3/H/A/3HALUVYIWE52Z0FTG86R41CS9XNJOQ/0347%20Australia%20LOA.pdf?t=aEp8cTA0eDA5fDB-Z74mL4xKUphNAjKfZ8Gr

Appendix 1. Contact information of project participants

Organization name	Suryaa Chamball Power Limited
Country	India
Address	602, 'A' Wing, Prathmesh Tower Premises CHS Ltd S. B. Marg, Lower Parel (W), Mumbai, Maharashtra - 400 013
Telephone	+91-22-61524300
Fax	+91-22-61524325
E-mail	power@suryachambalpowerltd.com
Website	
Contact person	Mr. S. Bagrodia

Appendix 2. Affirmation regarding public funding

There is no public funding for the project activity.

Appendix 3. Applicability of methodologies and standardized baselines

Applicability and eligibility of selected methodology (AMS I. D) has already been mentioned in section B.2 of the PDD.

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

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE	
VERSION:	14
DATE:	Dec 18
BASELINE METHODOLOGY	ACM0002 / Ver 17.0 and "Tool to Calculate the Emission Factor for an Electricity System", Version 6.0

http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

Net Generation in Operating Margin (GWH) (incl. Imports)			
	2015-16	**2016-17**	**2017-18**
Indian Grid	8,71,753.243	9,16,277.834	9,60,692.882

Simple Operating Margin (tCO2/MWh) (incl. Imports) (1) (2)			
	2015-16	**2016-17**	**2017-18**
Indian Grid	0.97	0.96	0.95

Build Margin (tCO2/MWh) (not adjusted for imports)			
As per Tool 07: EB100 Annex 4	**Para 72**	**BM**	**CP-II**
Indian Grid			0.8600

Weighted Generation Operating Margin	
Indian Grid	0.9610

Combined Margin Emission Factor	
Indian Grid	0.88525

Appendix 5. Further background information on monitoring plan

Please refer to section B.7.

Appendix 6. Summary report of comments received from local stakeholders

Please refer to section E.

Appendix 7. Summary of post-registration changes

This section has been left for purpose.

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Document information

Version	*Date*	*Description*
11	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for project activities" and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the "CDM project standard for project activities" (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the "Project design document form for small-scale CDM project activities" (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.

Version	*Date*	*Description*
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for CDM project activities" (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project activities, project design document