VALIDATION REPORT OF CREDITING PERIOD RENEWAL

HENAN XINXIANG 24MW BIOMASS BASED COGENERATION PROJECT

Document Prepared by China Classification Society Certification Company (CCSC)

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Summary:

China Classification Society Certification Company (CCSC), commissioned by Climate Bridge (Shanghai) Ltd., has performed the validation of the renewal of crediting period of the Henan Xinxiang 24MW Biomass based Cogeneration Project (hereafter referred to as "the Project") on the basis of requirements of Verified Carbon Standard (VCS) Version 4.1, VCS Validation and Verification Manual, and the approved Clean Development Mechanism (CDM) methodology ACM0006 (Version 15.0), as well as criteria given to provide for consistent project operations, monitoring and reporting. The validation report and the validation protocol are summarizing the findings of the validation.

The validation scope is defined as an independent and objective review and ex-ante determination of the estimated GHG emission reductions, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using CCSC's internal procedures.

The Project is a biomass residues based cogeneration project located in Xinxiang city, Henan Province, in the People's Republic of China which utilize of biomass residues for cogeneration of power and heat. The installed capacity of the project activity is 24 MW, consisting of 2 sets of steam turbine and generator with unit capacity of 12 MW. The average annual power delivered to the grid by the project is expected to be 126,709 MWh and the generation of heat with 909,200GJ/yr. Due to the project doesn't claim the emission reductions due to displacement of heat. The annual emission reductions in the second crediting period are 55,874 tCO_2.

The first output of the validation process is a list of 3 Clarification Requests, 2 Corrective Action Requests and 0 Forward Action Request (CL, CAR and FAR), presented in APPENDIX D. Taking into account this output, the project proponent revised its project document.

In summary, it is CCSC's opinion that the Project correctly applies the VCS approved CDM methodologies ACM0006 (Version 15.0) and meets the relevant VCS Standard v4.1 requirements and the relevant host country criteria.

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1 INTRODUCTION

1.1 Objective

Climate Bridge (Shanghai) Ltd. (hereafter referred to as "the PP") has commissioned CCSC to conduct the validation of the "Henan Xinxiang 24MW Biomass based Cogeneration Project" (here after referred as the Project), which is located in Huixian County, Xinxiang city, Henan Province, in the People's Republic of China.

CCSC as the validation/verification body (VVB) of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065.

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third-party assessment of the project baseline. In particular, the project's baseline and the monitoring plan (MP) are validated in order to confirm that the updated project baseline in the renewal of the crediting period, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Assessment of validation is a requirement for all VCS projects seeking renewal of crediting period and is seen as necessary to provide assurance to stakeholders of the quality of the project and its continuous generation of Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the VCS project description (VCS-PD) for the new 2nd crediting period, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against VCS Version 4.1 requirements, UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

CCSC has undertaken a reasonable assurance engagement in accordance with VCS Version 4.1 /21/. It requires a reasonable level of assurance in validation that GHG assertions are free of material errors, omissions and misrepresentations. The validation conclusion is based on the VCS Project Description (VCS-PD) /2/, supporting evidences made available to the verifier and information collected through performing interviews.

1.4 Summary Description of the Project

The Project is to utilize of biomass residues for cogeneration of power and heat. Due to the project doesn't claim the emission reductions due to displacement of heat, hence, the Project can reduce

GHG emissions by replacing the electricity generated by fossil fuel fired power plants Central China Power Grid (CCPG) and CH_4 emissions will be reduced by avoiding dumping of biomass residues.

The installed capacity of the project activity is 24 MW, consisting of 2 sets of steam turbine and generator with unit capacity of 12 MW. The average annual power delivered to the grid by the project is expected to be 126,709 MWh and the generation of heat with 909,200GJ/yr.

2 VALIDATION PROCESS

2.1 Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was performed using CCSC internal procedures.

CCSC validated the Project against the requirements set in VCS standard Version 4.1.

2.2 Document Review

The VCS-PD was submitted by Climate Bridge (Shanghai) Ltd. and additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the VCS-PD and information from sources other than those used.

The validation conclusions presented in this report relate to the Project as described in the VCS-PD version 01 dated 10-August-2021 /1/. To address CCSC's corrective action and clarification requests, the VCS-PD was revised to version 1.1 /2/ and resubmitted on 13-October-2021.

Appendix B of this report contains a complete list of all documents and proofs reviewed by the validation team.

2.3 Interviews

The follow-up interview was conducted during the site visit from 12-August-2021 to 14-August-2021 by the validation team from CCSC, which is focused on the issues identified during the desk review. The main topics of the interviews are summarized in Table 1.

2.4 Site Inspections

A site visit and interviews with project stakeholders was conducted by CCSC from 12-August-2021 to 14-August-2021 to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed Organization	Interview Topics
Climate Bridge (Shanghai) Ltd.	↳ Continuous implementation of the project and any modifications with respect to the VCS-PD for 2nd crediting period. ↳ Applicability of selected methodology. ↳ National policies and changes ↳ Baseline of the project and its updates ↳ Emission Factors, GWPs and their updates ↳ Monitoring plan and changes.
Xinxiang Tianjie Bio-Power Generation Co., Ltd.	

2.5 Resolution of Findings

The objective of this phase of the validation is to resolve issues that require further elaboration, research or expansion prior to CCSC's positive conclusion on the project design.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable, verifiable and additional emission reductions;

b) The applicable VCS requirements have not been met;

c) There is a risk that emission reductions cannot be monitored or calculated.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A Forward Action Request (FAR) may also be raised during validation, to identify issues related to project implementation that require review during the first validation of the project activity.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the VCS-PD or supporting annexes are documented in the Appendix D.

2.5.1 Forward Action Requests

No Forward Action Requests were raised during this validation.

3 VALIDATION FINDINGS

3.1 Project Details

The relevant information is listed below, which is consistent with the VCS-PD for the 1st crediting period:

Table 2 The Project information

Project Title:	*Henan Xinxiang 24MW Biomass based Cogeneration Project*
Sectoral Scope:	*01, "Energy Industries (renewable- /non-renewable resources)"*
Methodologies Used	*ACM0006 Version 15.0*
Project Start Date:	*28-October-2009*
Project Participants:	*Climate Bridge (Shanghai) Ltd. (P.R. China)* *Xinxiang Tianjie Bio-Power Generation Co., Ltd. (P.R. China, Host Party)*
Project Location:	*The project is located in Huixian County, Xinxiang city, Henan Province, in the People's Republic of China. The coordinates of the project location are longitude of 113°30'40" E and latitude of 35°19'50" N.*
Annual ERs	*55,874 tCO_2e*

CCSC also confirmed the location, technical information etc. of the project provided in the revised VCS-PD for 2nd crediting period is same with the VCS-PD for the 1st crediting period. It is confirmed that there is no change of the project implementation since the project started.

Table 3 The Project technical specifications

Parameter		*Value*
Installed capacity (MW)		*24*
Model of Boiler		
YG-75/3.82-T	*Units*	*2*
	Rated evaporative capacity	*75t/h*
	Steam-gas pressure	*3.821MPa*
	Water temperature	*150°C*
	Efficiency	*83%*
	Manufacture	*Jinan Boiler Group Co., Ltd.*

Model of steam turbine		
C12-3.43/0.98	*Units*	*2*
	Rated installed capacity	*12MW*
	Inlet pressure	*3.43MPa*
	Inlet temperature	*435°C*
	Rated steam flow	*75t/h*
	Rated revolution	*3,000r/min*
	Manufacture	*China Changjiang Energy Corp (Group)*
Model of generator		
QF-15-2	*Units*	*2*
	Rated power	*15MW*
	Rated voltage	*6,300V*
	Rated power factor	*0.8*
	Rated revolution	*3,000r/min*
	Manufacture	*China Changjiang Energy Corp (Group)*

Project crediting period

Renewable crediting period has been chosen by the Project, the 2nd 10 years crediting period is from ***28-October-2019 to 27-October-2029*** *which is in compliance with the VCS Standard ver 4.1.*

*Furthermore, due to the project is registered as a CDM project (UNFCCC Ref. 3054) and the crediting period under CDM is 21 years (7*3 renewable), therefore the total length of VCS crediting period should be no more than 21 years which is from 28-October-2009 to 27-October-2030 and the project is not eligible for VCU issuance beyond 27-October-2030.*

Project scale and estimated GHG emission reductions or removals

According to VCS standard, Projects are categorized by size according to their estimated average annual GHG emission reductions or removals:

1) Projects: Less than or equal to 300,000 tonnes of CO_2e per year.

2) Large projects: Greater than 300,000 tonnes of CO_2e per year.

The estimated annual average GHG emission reductions of the Project are 55,874 tCO_2e. CCSC confirmed that the Project is a project.

Conditions prior to project initiation

Prior to the initiation of the Project, the electricity estimated to be generated was obtained from CCPG; the heat was generated by coal-fired boilers with low efficiency; and the biomass residues was dumped or left to decay without utilizing for energy purpose. This is also the baseline scenario.

Project compliance with applicable laws, statutes and other regulatory frameworks

As described in the validation report of the 1st crediting period registered VCS-PD, the Project complies with relevant laws and regulations. CCSC also confirmed the Project is compliance with applicable laws, statutes and other regulatory frameworks.

Via checking the 2nd crediting period VCS-PD, CCSC also confirmed the Project is compliance with the eligibility of VCS program.

Participation under other GHG programs

- *Projects registered (or seeking registration) under other GHG program(s)*

The Project was registered as CDM project activity with the UNFCCC Reference No.3054 and the project also registered as a VCS project with the Ref. No. 1140.

CERs of 186,473 tCO_2 generated in monitoring period from 11-July-2011 to 31-December-2012 has been issued in CDM system, the emission reductions of 153,838 tCO_2 from 28-October-2009 to 10-July-2011 and the emission reductions of 454,707 tCO_2 from 01-January-2013 to 31-December-2017 was issued as VCUs in VCS system.

Since China has initiated ETS in July 2021, and as per the Notice (Huan ban qi hou [2021] No.9) issued by Ministry of Ecology and Environment of P.R.China (MEE), the fossil fuel power and/or heat generation plants in Henan Province are covered by China ETS, and also other seven industries will be included in the future.

However, as per the notice, the project activity is not covered by the mandatory emission control scheme and there is no emission cap enforced for the project owner.

Also, the CCSC verification team reviewed the regulation, and realises that the allowance (CEA) for power generation industries will be allocated on the basis of carbon emission intensity, i.e. the CEA allocation is not related with the components of local grid.

Furthermore, the CCSC verification team checked the No Double Counting Statement issued by the project owner, and confirms the PP will not issue the GHG emission reductions generated during the 2nd crediting period.

- *Rejection by other GHG programs*

The Project has not been rejected by other GHG programs as confirmed through the GS, VCS and CDM project data base.

Other forms of credit:

- *Emissions trading programs and other binding limits*

Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or for meeting binding limits on GHG emissions.

- *Other forms of environmental credit sought or received and eligible to be sought or received*

The Project has not created another form of Environmental Credit.

Additional information relevant to the project, including:

- *Leakage management for AFOLU projects*
- *N.A. for it's non-AFOLU project.*
- *Commercially sensitive information*
- *N.A.*
- *Sustainable development contributions*

The validation team confirms the implementation of the Project will contribute to sustainable development of the local community, the host country and the world by means of

- *SDG 7 Affordable and Clean Energy – verified by checking the Emission Reduction Calculation sheet;*
- *SDG 8 Decent Work and Economic Growth– verified by checking the employment contracts and monthly payroll to the plant staffs;*
- *SDG 13 Climate Action – verified by checking the Emission Reduction Calculation sheet.*

Project ownership

The ownership of the emission reductions will belong to the project owner as confirmed through the FSR Approval, EIA Approval and Business licence.

3.2 Safeguards

3.2.1 No Net Harm

According to the VCS-PD, there is no potential negative environmental and socio-economic impact of the continuous implementation of Project. CCSC confirmed it by verifying the registered VCS-PD and the relevant validation report and the follow-up interview.

3.2.2 Local Stakeholder Consultation

According to the CDM-PDD, local stakeholders were invited to provide comments by carried out the stakeholders meeting on 03-March-2008 which was prior to the start date of the construction. The processes by which comments from local stakeholders have been invited and compiled, has been described within the CDM-PDD. There is no need to change the project design based on the stakeholder inputs.

CCSC validation team confirmed that all the processes have been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals which in compliance with the VCS requirements in the monitoring process of 1st crediting period.

Furthermore, representatives from the local community were interviewed, the relevant evidences were presented to CCSC for assessment, it is confirmed that communications with Local stakeholders will be carried out at periodic intervals. The project owner will continuously carry out questionnaire survey for the local stakeholder to collect the relevant comments and suggestions during the 2nd crediting period.

In general, the interviewees show adequate understanding of the nature of the Project and agreed that the Project would benefit the environment, society and economic development. The response is overall supportive.

3.2.3 Environmental Impact

The environmental impacts of the Project were sufficiently assessed by means of an Environmental Impact Assessment (EIA) Study during the 1st crediting period. The Project have implemented the EIA and obtained the approval from local government before VCS registration.

And via checking the MR and verification reports in previous verification, CCSC validation team confirmed that after the completion of the construction, the project was put into operation after inspection and acceptance by the local environmental protection department. During the project operation, the project continues to contribute to the local society and economy by using clean renewable energy to reduce greenhouse gas emissions and the environmental pollution.

Hence, the validation team is able to confirm that the EIA has been conducted in accordance with the relevant Chinese Environmental Regulations and the environmental impact of the Project is insignificant.

3.2.4 Public Comments

No public comment was received.

3.2.5 AFOLU-Specific Safeguards

The project is not an AFOLU-Specific project.

3.3 Application of Methodology

3.3.1 Title and Reference

The VCS-approved methodology applied to the Project is the approved consolidated CDM baseline and monitoring methodology ACM0006 Version 15.0 "Electricity and heat generation from biomass" /14/.

The methodology also refers to:

- *Combined tool to identify the baseline scenario and demonstrate additionality, Version 07.0;*

- *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, Version 03.0;*
- *Project and leakage emissions from transportation of freight, Version 01.1.0;*
- *Project and leakage emissions from biomass, Version 04.0;*
- *"Tool to calculate the emission factor for an electricity system" (Version 07.0);*
- *"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).*

More information concerning the above methodology and tools can be referred to:

https://cdm.unfccc.int/methodologies/PAmethodologies/approved

and https://cdm.unfccc.int/Reference/tools/index.html

3.3.2 Applicability

CCSC has checked the definitions of ACM0006 Version 15.0 of the applicability of this methodology, and confirmed the comparison in the following table, which explains the reason why the methodology applies to the Project:

Table 3 the project applicability

ACM0006 Version 15.0	*Explanation*	*Validation Opinion*
This methodology is applicable to project activities that operate biomass (co-)fired power and-heat plants. The CDM project activity may include the following activities or, where applicable, combinations of these activities: *(a) The installation of new plants at a site where currently no power or heat generation occurs (Greenfield projects);* *(b) The installation of new plants at a site where currently power or heat generation occurs. The new plant replaces or is operated next to existing plants (capacity expansion projects);* *(c) The improvement of energy efficiency of existing biomass-based power-and-heat plants (energy efficiency improvement projects), which can also lead to a capacity expansion, e.g. by retrofitting the existing plant;*	*The project is new-build project, and which is to generate electricity and heat by utilizing surplus stalks and waste wood in the project region.*	*By site visit and checking FSR and project approval, it is able to confirm the Project is applicable to this criteria.*

(d) The total or partial replacement of fossil fuels by biomass in existing power-and-heat plants or in new power-and-heat plants that would have been built in the absence of the project (fuel switch projects), e.g. by increasing the share of biomass use as compared to the baseline, by retrofitting an existing plant to use biomass.		
Biomass used by the project plant is limited to biomass residues, biogas, RDF and/or biomass from dedicated plantations;	*Fuel fired in this project plants is agricultural stalks and waste wood, no other biomass types are used.*	*By site visit and checking FSR and project approval, it is able to confirm the Fuel fired in this project plant is agricultural stalks and waste wood which are biomass residues.*
Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired does not exceed 80% of the total fuel fired on energy basis;	*Not applicable. The project does not co-fire fossil fuels.*	*By site visit and checking FSR and project approval, it is able to confirm that there are no fossil fuels co-fired in the project plant.*
For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generating the residues) raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process;	*Not applicable. The biomass residues used in this project are not from a production process.*	*By site visit and checking FSR and project approval, it is able to confirm that the biomass residues used in this project are not from a production process.*
The biomass used by the project plant is not stored for more than one year;	*Not applicable. As the biomass residues used for this project are agricultural stalks and waste wood, and the storage period is 4-6 months, less than*	*By site visit and checking FSR, project approval and the validation report for 1st crediting period, it is able to confirm that the biomass residues*

	one year.	*used by the project plant is not stored for more than one year.*
The biomass used by the project plant is not processed chemically or biologically (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio- or chemical-degradation, etc.) prior to combustion. Drying and mechanical processing, such as shredding and pelletisation, are allowed.	*The project only involves drying and shredding.*	*By site visit and checking FSR, project approval and the validation report for 1st crediting period, it is able to confirm that the biomass residues used by the project plant is not processed chemically or biologically but only physical drying and shredding.*
In the case of fuel switch project activities, the use of biomass or the increase in the use of biomass as compared to the baseline scenario is technically not possible at the project site without a capital investment in: *(a) The retrofit or replacement of existing heat generators/boilers; or* *(b) The installation of new heat generators/boilers; or* *(c) A new dedicated supply chain of biomass established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); or* *(d) Equipment for preparation and feeding of biomass.*	*Not applicable. The project is new-build biomass generation power project by utilizing surplus stalks and waste wood in the project region.*	*By site visit and checking FSR, project approval and the validation report for 1st crediting period, it is able to confirm that the project new-built, no fuel switch involved.*
If biogas is used for power and heat generation, the biogas must be generated by anaerobic digestion of wastewater, and: *(a) If the wastewater generation source is registered as a CDM project activity, the details of*	*Not applicable. The project does not involve utilization of biogas for power or heat generation.*	*By site visit and checking FSR, project approval and the validation report for 1st crediting period, it is able to confirm that*

the wastewater project shall be included in the PDD, and emission reductions from biogas energy generation are claimed using this methodology; *(b) If the wastewater source is not a CDM project, the amount of biogas does not exceed 50% of the total fuel fired on energy basis.*		*no biogas involved in the project.*
In the case biomass from dedicated plantations is used, the applicability conditions of the "TOOL16: Project and leakage emissions from biomass" apply.	*Not applicable. The biomass residues used in this project plants are from surrounding the project region.*	*By site visit and checking FSR, project approval and the validation report for 1st crediting period, it is able to confirm that the biomass residues used in this project plants is from surrounding the project region and no biomass from dedicated plantations involved in the project.*

Also, the applicable of tools used for the project activity are justified in the PD, validation team find the correctness of the applicable.

It can be concluded from the above analysis that the Project complies with the applicability requirement of the methodology ACM0006 Version 15.0.

3.3.3 Project Boundary

According to ACM0006 Version 15.0, spatial extent of the project boundary includes the site where the biomass residues would have been left for decay or dumped. Electricity generated by the Project was delivered to CCPG. According to 2019 Baseline Emission Factors for Regional Power Grids in China issued by China's DNA which provides the delineation of grid boundaries, CCPG is the grid boundary of the Project. CCPG is composed of includes provinces of Jiangxi, Henan, Hubei, Hunan, Chongqing, Sichuan. And the project doesn't claim the emission reductions due to displacement of heat from coalfired boilers.

Overall, the project proponents provided an accurate description of the project boundary and the greenhouse gases and emission sources included in or excluded in the project activity have been correctly determined in the VCS-PD.

3.3.4 Baseline Scenario

The validation team confirms that according to CDM-PDD of 1st crediting period and the methodology, the baseline scenario is determined as the electricity estimated to be generated was obtained from CCPG and the biomass residues was dumped or left to decay without utilizing for energy purpose.

Due to this is the validation of renew of crediting period, in order to check the validity of the original baseline or its updates the validation team has applied the following stepwise approach:

Step 1: Check of assessment to the validity of the current baseline for the next crediting period

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

The baseline of the registered CDM-PDD has been assessed to be compliant with the national legislation and policies applicable for the project activity at the time of validation.

During the first crediting period the PP has frequently reviewed the legal requirements and policies relevant for the baseline of the project. On the basis of this the PP has arrived at the conclusion that there are no new national and/or sectoral policies that could affect the baseline scenario during the renewal of the crediting period, and CCSC confirmed that the baseline is still in line with all applicable legislations and policies.

Step 1.2: Check of assessment to the impact of circumstances

CCSC validation team has independently checked whether there are changes in circumstances which have an impact on the original baseline, such as searching the website of national government and interview with the PP and local officer. No such changes have been identified and thus it is deemed appropriate not to revise the baseline due to changes in circumstances.

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

There is no baseline equipment involved.

Step 1.4: Check of assessment of the validity of the data and parameters

In accordance with the methodology, the grid emission factor and all the values in its calculation are updated. IPCC default value, the weighted average CO_2 emission factor of diesel 0.0748 tCO_2/GJ has been updated from IPCC 2006. Global warming potential of CH_4 28 tCO_2e/tCH_4 have been updated from 2006 IPCC Guideline and IPCC Fifth Assessment Report (AR5). These changes have been appropriately considered in the updated PD /2/.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Check of the update to the current baseline

As per the check in step 1 above, it is confirmed that the current baseline does not need to be updated.

Step 2.2: Check of the update to the data and parameters

Refer to above step 1.4 and below section 3.3.6 for details assessment of the updated data and parameters.

In conclusion, the original baseline scenario of the project as per the registered CDM-PDD is still valid for the 2nd crediting period.

Most of the data and parameters determined ex-ante are still valid except for the $EF_{grid,CM,y}$ and GWP_{CH4} and $EF_{CO2,diesel,y}$ were re-determined in the baseline emission calculation.

3.3.5 Additionality

According to the Verified Carbon Standard (VCS) Version 4.1 a reassessment of additionality is not required when renewing the project crediting period.

3.3.6 Quantification of GHG Emission Reductions and Removals

As per applied methodology ACM0006 Version 15.0, the emission reductions are the difference between baseline emissions and project emissions and leakage.

Baseline Emissions

The calculation of the baseline emissions followed the procedures described in the methodology ACM0006 Version 15.0. Baseline emissions are to be calculated as follows:

$$BE_y = EL_{BL,GR,y} \times EF_{EG,GR,y} + \sum_f FF_{BL,HG,y,f} \times EF_{FF,y,f} + EL_{BL,FF/GR,y} \times min\left(EF_{EG,GR,y}, EF_{EG,FF,y}\right) + BE_{BR,y} \quad (1)$$

Where:

BE_y	=	*Baseline emissions in year y (t CO_2)*
$EL_{BL,GR,y}$	=	*Baseline electricity sourced from the grid in year y (MWh)*
$EF_{EG,GR,y}$	=	*Grid emission factor in year y (t CO_2/MWh)*
$FF_{BL,HG,y,f}$	=	*Baseline fossil fuel demand for process heat in year y (GJ)*
$EF_{FF,y,f}$	=	*CO_2 emission factor for fossil fuel type f in year y (t CO_2/GJ)*
$EL_{BL,FF/GR,y}$	=	*Baseline uncertain electricity generation in the grid or on-site or off-site power-only units in year y (MWh)*
$EF_{EG,FF,y}$	=	*CO_2 emission factor for electricity generation at the project site or off-site plants in the baseline in year y (t CO_2/MWh)*
$BE_{BR,y}$	=	*Baseline emissions due to disposal of biomass residues in year y (t CO_2e)*
f	=	*Fossil fuel type*

Step 1: Determine the total baseline process heat generation, electricity generation and capacity

constraints, and efficiencies

Step 1.1: Determine the total baseline process heat generation

The project doesn't claim the emission reductions due to displacement of heat, therefore, this step is not applicable.

Step 1.2: Determine the baseline capacity of electricity generation ($CAP_{EG,total,y}$)

As the project is a green-field project, there is no heat engines employed in the baseline scenario. Therefore, the baseline capacity of electricity generation is set to be zero to further consider the minimum baseline electricity generation in the grid in step 2

Step 1.3: Determine the efficiencies of heat generators, and efficiencies and heat-to-power ratio of heat engines

The project doesn't claim the emission reductions due to displacement of heat, therefore, this step is not applicable.

Step 2: Determine the baseline electricity sourced from the grid and emission factors;

Step 2.1: Determine the baseline electricity generation ($EL_{BL,y}$)

The amount of electricity that would be generated in the baseline in year y equals the amount of electricity generated in the project scenario as follows:

$$EL_{BL,y} = EL_{PJ,gross,y} + EL_{PJ,imp,y} - EL_{PJ,aux,y} \quad (2)$$

Where:

$EL_{BL,y}$	=	*Baseline electricity generation in year y (MWh)*
$EL_{PJ,gross,y}$	=	*Gross quantity of electricity generated in all power plants included in the project boundary in year y (MWh)*
$EL_{PJ,imp,y}$	=	*Project electricity imports from the grid in year y (MWh)*
$EL_{PJ,aux,y}$	=	*Total auxiliary electricity consumption required for the operation of the power plants in year y (MWh)*

Since there is no off-site electricity consumption in the project, $\mathrm{EL_{PJ,aux,y}}$ *sources from* $\mathrm{EL_{PJ,gross,y}}$ *and* $\mathrm{EL_{PJ,imp,y}}$*. And* $\mathrm{EL_{PJ,exp,y}}$ *is that the project electricity exports to grid in year y (MWh). Therefore, the difference between* $\mathrm{EL_{PJ,gross,y}}$ *and* $\mathrm{EL_{PJ,aux,y}}$ *equals the* $\mathrm{EL_{PJ,exp,y}}$ *minus* $\mathrm{EL_{PJ,imp,y}}$*. Hence*

$$\mathrm{EL_{BL,y}} = \mathrm{EL_{PJ,gross,y}} + \mathrm{EL_{PJ,imp,y}} - \mathrm{EL_{PJ,aux,y}} = \mathrm{EL_{PJ,exp,y}} \quad (3)$$

And the ex ante estimated value for both parameters are derived from FSR.

Step 2.2: Determine the baseline electricity sourced from the grid ($EG_{BL,GR,y}$)

The amount of electricity that would be sourced from the grid in the baseline is calculated assuming that the amount of electricity generated on-site and off-site in the baseline shall be limited by the installed capacity of power generation available in the baseline scenario (on-site and off-site), hence based on above assessment, $EL_{BL,GR,y} = EL_{BL,y}$

Step 2.3: Determine the emission factor of grid electricity generation ($EF_{EG,GR,y}$)

$EF_{EG,GR,y}$ is equal to $EF_{grid,CM,y,}$ and the $EF_{grid,CM,y}$ is determined as Combined Margin (CM), combination of the Operating Margin (OM) and Build Margin (BM), which is calculated ex ante and fixed for the second crediting period following the "Tool to calculate the emission factor for an electricity system" (version 07.0).

***Operating Margin (OM)**. Ex-ante option was selected. Simple OM method was chosen and this is justified since the low cost/must run resources constitute less than 50% of total grid generation in the average of the five recent years. 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", as per "Tool to calculate the emission factor for an electricity system".*

Because (1) the net electricity generation and a CO_2 emission factor of each power unit are not available in China, and (2) the nuclear and renewable power generations are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known in China, at the same time, (3) off-grid power plants are not included in the calculation. The "Option B - Calculation based on total fuel consumption and electricity generation of the system" is adopted for Simple OM calculation, which is "based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system".

Net calorific values of each fuel type were obtained from the China Energy Statistical Yearbook. IPCC 2006 default values were used for the CO_2 emission factors of each type of fossil fuel. The values used and the calculation of the simple OM is considered to be reasonable, and is in line with official data published by the Government of China.

*The OM emission factor is calculated as the weighted average of the three years. The **$EF_{grid,OM,y}$** is calculated to be 0.8587 tCO_2/MWh, which is in line with the 2019 Baseline Emission Factors for Regional Power Grids in China. The sources and calculation have been verified by CCSC.*

***Build Margin (BM)**. BM emission factor was calculated with Option 1 of "Tool to calculate the emission factor for an electricity system" with ex-ante approach. Because plant specific fuel consumption and electricity generation data are not publicly available in China, the guidance given by the CDM Executive Board for a deviation from methodology AM0005 has been applied for calculation of the BM emission factor for the proposed project, which suggests to "use the*

efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM)" .

In accordance with this guidance, the build margin consists of the set of power capacity additions in the electricity system that comprises 20% of the generation capacity (in MW) of the system, that have been built most recently, based on the aggregate incrementally installed capacity of all generation sources in year y. The emissions factor of fossil fuel fired power generation in CCPG is calculated using the proportions of GHG emissions from solid, liquid and gaseous fuels in the total GHG emissions related to power generation as the weights, and the emission factors of the most advanced commercial generation technologies available in the host country (as published by the DNA).

Finally, based on data in the China Electric Power Yearbook 2016-2018, $EF_{grid, BM, y}$ is calculated to be 0.2854 tCO_2/MWh, which is in line with the 2019 Baseline Emission Factors for Regional Power Grids in China. The sources and calculation have been verified by CCSC.

Combined Margin (CM). *CM emission factor is calculated following "weighted average CM method (option A)" of "Tool to calculate the emission factor for an electricity system"(version 07.0). The weighting is set to be 0.25 and 0.75 for OM and BM emission factors respectively for biomass residues power generation. For this project, the combined baseline emission factor will remain fixed during the second crediting period, via $EF_{grid,CM,y}=EF_{grid,OM,y}\times \omega_{OM} + EF_{grid,BM,y}\times \omega_{BM}$ $=0.8587\times0.25+ 0.2854\times0.75=0.4287tCO_2/MWh$.*

As validated above, the $EF_{EG,GR,y}$ which equal to $EF_{grid,CM,y,}$ of the project is $0.4287tCO_2/MWh$.

Step 2.4: Determine the emission factor of on-site electricity generation with fossil fuels ($EF_{EG,FF,y}$)

Via site visit, it is confirmed no fossil fuel combusted for power generation in the project site, hence $EF_{EG,FF,y} = EF_{EG,GR,y}= EF_{grid,CM,y}$.

Step 3: Determine the baseline biomass-based heat and power generation

Not applicable due to project doesn't claim the emission reductions due to displacement of heat.

Step 4: Determine the baseline demand for fossil fuels to meet the balance of process heat and the corresponding electricity generation

Not applicable due to project doesn't claim the emission reductions due to displacement of heat.

Step 5: Determine the baseline emissions due to uncontrolled burning or decay of biomass residues

Step 5.1: Determine $BE_{BR,B1/B3,y}$

As per the re-assessment the baseline scenario, it is confirmed the emissions are determined separately for biomass residues categories for which scenarios B1 (aerobic decay) apply.

$$BE_{BR,y} = BE_{BR,B1,y} = GWP_{CH4} \times \sum_{n} BR_{B1,n,y} \times NCV_{BR,n,y} \times EF_{BR,n,y} \quad (4)$$

Where:

$BE_{BR,y}$	=	*Baseline emissions due to disposal of biomass residues in year y (t CO_2e)*
$BE_{BR,B1,y}$	=	*Baseline emissions due to aerobic decay of biomass residues in year y (t CO_2)*
GWP_{CH4}	=	*Global Warming Potential of methane valid for the commitment period (t CO_2/t CH_4)*
$BR_{B1,n,y}$	=	*Quantity of biomass residues of category n used in the CDM project activity in year y for which the baseline scenario is B1 (tonnes on dry-basis)*
$NCV_{BR,n,y}$	=	*Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis)*
$EF_{BR,n,y}$	=	*CH_4 emission factor for uncontrolled burning of the biomass residues category n during the year y (tCH_4/GJ)*
n	=	*Biomass residue category*

For the 2nd crediting period,

GWP_{CH4} is 28 tCO_2e/ tCH_4 from IPCC Fifth Assessment Report (AR5) compliance with VCS standard.

$NCV_{BR,n,y}$ and $EF_{BR,n,y}$, a default value of 0.0027 t CH_4/ t biomass is recommended, adjusted by a conservativeness factor (i.e. 0.73) to address the high level of uncertainty, hence 0.001971 t CH_4/t is used.

The quantity of the dry matter of maize stalk $BF_{maize\ stalk,y}$ is 88,080t, and $BF_{waste\ wood,y}$ is 88,080t derived from estimated value in FSR.

Therefore, based on above assessment for each step, the ex ante estimated baseline emissions are finally calculated as below,

$BE_y = EL_{BL,GR,y} \times EF_{EG,GR,y} + BE_{BR,y}$

$=EL_{BL,y} \times EF_{grid,CM,y} + GWP_{CH4} \times \sum_n BR_{B1,n,y} \times NCV_{BR,n,y} \times EF_{BR,n,y}$

*=126,709MWh*0.4287tCO_2e/MWh+28tCO_2e/tCH_4*(88,080t+88,080t) * 0.001971tCH_4/t*

= 54,320 tCO_2e + 9,722 tCO_2e= 64,042 tCO_2e

Project Emissions

According to the methodology ACM0006 (version 15.0), the project emissions are calculated as follows:

$$PE_y = PE_{FF,y} + PE_{GR1,y} + PE_{GR2,y} + PE_{TR,y} + PE_{BR,y} + PE_{WW,y} + PE_{BG2,y} + PE_{BC,y} \quad (5)$$

Where:

PE_y	=	*Project emissions in year y (t CO_2)*
$PE_{FF,y}$	=	*Emissions during the year y due to fossil fuel consumption at the project site (t CO_2)*
$PE_{GR1,y}$	=	*Emissions during the year y due to grid electricity imports to the project site (t CO_2)*
$PE_{GR2,y}$	=	*Emissions due to a reduction in electricity generation at the project site in year y (t CO_2)*
$PE_{TR,y}$	=	*Emissions during the year y due to incremental transport of biomass to the project plant (t CO_2)*
$PE_{BR,y}$	=	*Emissions from the combustion of biomass during the year y (t CO_2e)*
$PE_{WW,y}$	=	*Emissions from wastewater generated from the treatment of biomass in year y (t CO_2e)*
$PE_{BG2,y}$	=	*Emissions from the production of biogas in year y (t CO_2e)*
$PE_{BC,y}$	=	*Project emissions associated with the cultivation of land to produce biomass in year y (t CO_2)*

1. Determination of PE_{FFy}

As per the "TOOL03: Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Option B is chosen, the formula is:

$$PE_{FFy} = \sum_i FC_{projectsite,i,y} \cdot NCV_{i,y} \cdot EF_{CO_2,i,y} \quad (6)$$

Where:

PE_{FFy}	=	*Are the CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2/yr)*
$FC_{projectsite,i,y}$	=	*Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)*
$NCV_{i,y}$	=	*Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit), due to i only related to diesel, hence it is $NCV_{diesel,y}$*
$EF_{CO_2,i,y}$	=	*Is the weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ) , due to i only related to diesel, hence it is $EF_{CO2,diesel,y}$*
i	=	*Are the fuel types combusted in process j during the year y*

For the 2nd crediting period, i only related to diesel for this project.

$FC_{projectsite,i,y}$ is ex ante estimated as 15t confirmed as conservative,

$NCV_{diesel,y}$ is 42.652GJ/t based on China Energy Statistical Yearbook 2018

$EF_{CO2,diesel,y}$ is 0.0748 tCO_2/GJ soured from 2006 IPCC default value at the upper limit of the uncertainty at a 95% confidence interval.

Hence, ex ante estimated value of $PE_{FF,y}$ is calculated as 48 tCO_2

2. Determination of $PE_{GR1,ye}$

For the 2nd crediting period, as assessed above, $EL_{PJ,imp,y}$ is 0 MWh, hence $PE_{GR1,y}$=0 tCO_2

3. Determination of $PE_{TR,y}$

As per the "TOOL12: Project and leakage emissions from transportation of freight", Option B is chosen, the formula from applied methodology is:

$$PE_{TR,y} = PE_{TR,m} = \sum D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6} \quad (7)$$

Where:

$PE_{TR,m}$	=	*Project emissions from transportation of freight monitoring period m (t CO_2)*
$D_{f,m}$	=	*Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (km)*
$FR_{f,m}$	=	*Total mass of freight transported in freight transportation activity f in monitoring period m (t)*
$EF_{CO2,f}$	=	*Default CO_2 emission factor for freight transportation activity f (g CO_2/t km)*
f	=	*Freight transportation activities conducted in the project activity in monitoring period m*

For the 2nd crediting period,

$D_{f,m}$ is ex ante estimated as 100km confirmed as conservative,

$FR_{f,m}$ is 193,091t included 93,902t of maize stalks and 99,189t of waste wood derived from FSR,

$EF_{CO2,f}$ is 245 g CO_2e/t km soured from TOOL12 and confirmed as conservative,

Hence, ex ante estimated value of $PE_{TR,y}$ is calculated as 4,731 tCO_2

4. Determination of $PE_{BR,y}$

As per the applied methodology, the formula is:

$$PE_{BR,y} = GWP_{CH4} \times EF_{CH4,BR} \times \sum_{n} BR_{PJ,n,y} \times NCV_{BR,n,y} \quad (8)$$

Where:

$PE_{BR,y}$	=	*Emissions from the combustion of biomass residues during the year y (tCO_2e)*
GWP_{CH4}	=	*Global Warming Potential of methane valid for the commitment period (tCO_2/tCH_4)*
$EF_{CH4,BR}$	=	*CH_4 emission factor for the combustion of biomass residues in the project plant (tCH_4/GJ)*
$BR_{PJ,n,y}$	=	*Quantity of biomass residues of category n used in the CDM project activity in year y (tonnes on dry-basis)*
$NCV_{BR,n,y}$	=	*Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis)*

For the 2nd crediting period,

GWP_{CH4} is 28 tCO_2e/ tCH_4 from IPCC Fifth Assessment Report (AR5) compliance with VCS standard.

$EF_{CH4,BR}$ is default value as 30 kg CH_4/TJ, and the uncertainty is estimated to be 300%, thus a conservativeness factor of 1.37 is applied to the CH_4 emission factor

$BR_{PJ,n,y}$ including quantity of dry matter $BR_{BL,maize\ stalk,y}$ is 88,080t, and $BR_{BL,waste\ wood,y}$ is 88,080t derived from FSR.

$NCV_{BR,n,y}$ including $NCV_{maize\ stalk}$ is 17.79 GJ/t, and $NCV_{waste\ wood}$ is 15.64 GJ/t derived from FSR.

Hence, ex ante estimated value of $PE_{TR,y}$ is calculated as 3,389 tCO_2

5. Determination of $PE_{WW,y}$

Not applicable to the project by site visit and checking the registered PDD.

6. Determination of $PE_{BG2,y}$

Not applicable to the project by site visit and checking the registered PDD.

7. Determination of $PE_{BC,y}$

Not applicable to the project by site visit and checking the registered PDD.

Finally, ex ante estimated project emissions are calculated as 8,168 tCO_2 which has been assessed by CCSC as correct.

Leakage

In accordance with ACM0006. TOOL 16 "Project and leakage emissions from biomass"(version 04.0) is used to determination of the leakage.

As above re-assessment of the baseline scenario, the alternative scenario of the biomass

residues in absence of the project activity is defined as B1. And for biomass residues categories for which scenarios B1, the following procedure should be used,

"Demonstrate that there is an abundant surplus of the biomass residue in the project region which is not utilized. For this purpose, demonstrate that the total quantity of that type of biomass residues annually available in the project region is at least 25 per cent larger than the quantity of biomass residues which is utilized annually in the project region (e.g. for energy generation or as feedstock), including the project facility."

For 2nd crediting period, via checking the biomass residues quantities survey in the 2018 biomass residues fuel special report of Hui Xian City and calculation as provided in PD, CCSC verified that the quantity of each type of biomass residues available in the region is at least 25% larger than the quantity of biomass residues of that type which is utilized in the region.

Emission Reductions

In accordance with ACM0006, Version 15.0, summary of emission reductions during the 2nd crediting period is as below formula,

$$ER_y = BE_y - PE_y - LE_y \quad (9)$$

where

ER_y	=	*Emissions Reductions in year y (tCO_2e)*
BE_y	=	*Baseline Emissions in year y (tCO_2e)*
PE_y	=	*Project Emissions in year y (tCO_2e)*
LE_y	=	*Leakage Emissions in year y (tCO_2e)*

*Hence, based on above calculation for this project, the estimated average annual emission reductions of 55,874tCO_2e, resulting in estimated amount of GHG emission reductions (**ER_y**) is 558,740 tCO_2e during the 2nd crediting period with 10 years (28-October-2019 to 27-October-2029).*

CCSC has checked the Emission Reduction calculation sheet and found correct and transparent and confirmed,

- *All assumptions and data used by the project participants are listed in the PD, including their references and sources;*
- *All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PD;*
- *All values used in the PD are considered reasonable in the context of the proposed project activity;*

- *The methodology ACM0006 and* all the related tools *have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;*

- *All estimates of the emission reductions can be replicated using the data and parameter values provided in the PD.*

3.3.7 Methodology Deviations

For 2nd crediting period, the Build Margin CO_2 emission factor ($EF_{grid,BM,y}$) sources directly from the 2019 Baseline Emission Factors for Regional Power Grids issued by China DNA. And there is a deviation for the calculation method of $EF_{grid,BM,y}$ which follows the conservative principle and not impact the application of the methodology.

3.3.8 Monitoring Plan

The VCS PD applies the approved consolidated monitoring methodology ACM0006 Version 15.0. CCSC confirmed that the selected monitoring methodology is applicable to the Project and is materially the same as the PD for the 1st crediting period with some monitoring parameters updated according to the methodology ACM0006 Version 15.0.

Data and Parameters ex ante determined

- *$EF_{grid,CM,y}$, baseline grid emission factor*

  Derived from 2019 Baseline Emission Factors for Regional Power Grids issued by China DNA following the requirements in "Tool to calculate the emission factor for an electricity system version 07.0"

- *GWP_{CH4}, Global warming potential of CH_4*

  Default value of 28 tCO_2/tCH_4 from IPCC Fifth Assessment Report (AR5). Shall be updated according to any future VERRA decisions.

- *$EF_{CO2,f}$, Default CO_2 emission factor for freight transportation activity f*

  Conservative default value of 245 g CO_2e/t km from TOOL 12 Project and leakage emissions from transportation of freight version 1.1.0"

- *$NCV_{BR,n,y} \bullet EF_{BR,n,y}$, The CH_4 emission factor for the combustion of biomass residues in the project plant in year y*

  Default value of 0.001971 tCH_4/t from ACM0006 version 15.0.

- *$EF_{CH4,BR}$, CH_4 emission factor for the combustion of biomass residues in the project plant*

  Default value of 41.1 $kgCH_4/TJ$ from ACM0006 version 15.0.

- *$NCV_{diesel,y}$, The net calorific value (energy content) of diesel*

  Country-specific default value of 42.652 GJ/t from China Energy Statistical Yearbook 2018

- *$EF_{CO2,diesel,y}$, The CO_2 emission factor of diesel in year y*

  Default value of 0.0748 tCO_2/GJ from 2006 IPCC Guidelines, Volume 2, Chapter 1, Table 1.4, default value at the upper limit of the uncertainty at a 95% confidence interval

Data and Parameters Monitored

- *$EL_{PJ,exp,y}$, The project electricity exports to grid in year y*

  The project electricity exports to grid will be monitored continuously through the Bi-directional metering equipment (measure meter) at the project site. The meter(s) measuring electricity supply will maintain accuracy within 0.2s according to the national standard Technical Administrative Code of Electric Energy Metering (DL/T 448-2016). The consistency of metered electricity generation will be cross-checked with receipts from electricity sales (if available) and the quantity of fuels fired.

- *$EL_{PJ,imp,y}$, The project electricity imports from the grid in year y*

  The project electricity imports from the grid in year y will be monitored continuously through the Bi-directional metering equipment (measure meter) at the project site. The meter(s) measuring electricity supply will maintain accuracy within 0.2s according to the national standard Technical Administrative Code of Electric Energy Metering (DL/T 448-2016). The consistency of metered electricity generation will be cross-checked with receipts from electricity purchase.

- *For biomass residues categories for which scenarios B1, B2 or B3 is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario*

  It will be monitored by checking the local statistical data.

- *$BR_{B1,n,y}$, Quantity of biomass residues of category n used in the project activity in year y.*

  Biomass categories and quantities used by the project will be monitored continuously through the electronic belt weight installed at the feeding inlet of the boiler. Adjust for the moisture content in order to determine the quantity of dry biomass, and will be crosscheck the measurements with an annual energy balance that is based on purchased quantities and stock changes.

- *Moisture content of the biomass residues*

  Moisture content of the biomass residues will be monitored continuously through the drying oven & balance installed in laboratory of the project site to determine once for the water content of the biomass of each freight transported.

- *$FC_{projectsite,i,y}$, Quantity of diesel combusted in the project activity during the year y*

  Quantity of diesel combusted by the project will be derived from on-site measurement by the records of diesel purchase and remained and it will be cross-checked with diesel purchase invoice.

- *$FR_{f,m}$, Total mass of freight transported in freight transportation activity f in monitoring period m*

  Quantity of biomass residues by freight transported to the project will be monitored continuously through the weight meter installed in the gate of the project site. The relevant staff records the type and mass of the biomass of each freight transported and it will be crosschecked with an annual energy balance that is based on purchased quantities and stock changes.

- *$D_{f,m}$, Return trip road distance between the origin and destination of freight transportation activity f in monitoring period m*

  Return trip road distance will be derived from distance records provided by the truckers by comparing recorded distances with other information from other sources (e.g. maps). All the biomass residues supply sites are within 50 kilometers away around the site of the Project. Therefore, the 100 kilometers that will be used is verified as conservative.

- *NCV_k, Net calorific value of biomass residue of category n in year y*

  Net calorific value of biomass residue will be measured at reputed laboratories and according to relevant international standards, it will be measured every six months, taking at least three samples for each measurement.

CCSC confirms that the monitoring plan contains all necessary monitored parameters, and they are clearly described, and the monitoring plan complies with the requirements of the methodology.

Implementation of the Monitoring Plan

The quality assurance and quality control procedure has been clearly described in the revised VCS-PD. This includes description of the responsibilities, monitoring data, meters precision, meters calibration frequency, data management system, QA/QC procedure, training and emergency procedures. And it is same with the one in the registered CDM-PDD.

The validation team considers that the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the Project can be reported ex post and verified.

CCSC hereby confirms that the monitoring plan complies with the requirements of the methodology including applicable tool(s), the monitoring arrangements described in the monitoring plan are feasible within the project implementation and the project owners are able to continuously implement the described monitoring plan.

3.4 Non-Permanence Risk Analysis

As the Project is not an AFOLU project, the project activity does not require a non-permanence risk analysis.

4 VALIDATION CONCLUSION

CCSC has performed the validation of renew of crediting period of "Henan Xinxiang 24MW Biomass based Cogeneration Project", which applied the methodology ACM0006 Version 15.0. The validation was performed on the basis of VCS Standard Version 4.1 and host country criteria and also on the criteria given to provide for consistent Project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interview with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Through detailed analysis of the Project, it is concluded that the Project is likely to result in reductions of GHG emissions. The "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" has been applied to identify the validity of the original baseline. Emission reductions attributable to the Project are hence additional to any that would occur in the absence of the Project.

The validation of renew of crediting period covered all project components and issues that need to be validated as a VCS project. In our opinion, CCSC hereby confirms that the Project correctly applied the baseline and monitoring methodology ACM0006 Version 15.0 and meets the relevant VCS requirements for registration.

CCSC hereby requests the of renew of crediting period of the Project. Provided that the project is implemented and maintained as 1st crediting period, the Project is expected to achieve annual average emission reduction of 55,874tCO_2e within the 2nd crediting period.

APPENDIX A: ABBREVIATIONS

Abbreviations	Full texts
AFOLU	Agriculture, Forestry and Other Land Use
BM	Build Margin
CAR	Corrective Action Request
CCPG	Central China Power Grid
CCSC	China Classification Society Certification Company
CCER	China Certified Emission Reductions
CDM	Clean Development Mechanism
CL	Clarification Request
CCSC	China Classification Society Certification Company
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DOE	Designated Operation Entity
DNA	Designated National Authority
EB	Executive Board
EF	Emission Factor
EIA	Environmental Impact Assessment
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG(s)	Greenhouse gas(es)
GS	Golden Standard
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Return Rate

MEE	Ministry of Ecology and Environment of the People's Republic of China
MP	Monitoring Plan
NDRC	National Development and Reform Committee
OM	Operating Margin
PD	Project Description
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Voluntary Carbon Unit
VVB	Validation / Verification Body

APPENDIX B: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Mr. Li Xingtong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Mr. Liao Ling

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA13.1/TA14.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA13.1/TA14.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Mr. Zhou Wusen

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2

■ CDM verifier for Technical Area(s): TA1.2

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
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CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Ms. Xie Fengjun

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2/TA13.1/TA13.2

■ CDM verifier for Technical Area(s): TA1.2/TA13.1/TA13.2

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

APPENDIX C: DOCUMENTS REVISED OR REFERENCED

No.	Author	Title	References to the document	Provider
/1/	Climate Bridge (Shanghai) Ltd.	VCS-PD sent to CCSC for renew of crediting period validation	Version 01 10-August-2021	PP
/2/	Climate Bridge (Shanghai) Ltd.	Final VCS-PD to request renew of crediting period	Version 1.1 13-October-2021	PP
/3/	Climate Bridge (Shanghai) Ltd.	Emission Reductions Calculation Spreadsheet	/	PP
/4/	Zhengzhou Designing Institute of Coal Industry	FSR	03-June-2008	PP
/5/	Henan Province Development and Reform Commission	FSR Approval	13-August-2008	PP
/6/	Beijing Xinguohuan Environmental Technology Development Co., Ltd.	EIA	March 2008	PP
/7/	Henna Province environmental protection agency	EIA Approval	12-June-2008	PP
/8/	Local Government	Business License of project owner	/	PP
/9/	Equipment Manufactures	Nameplates of the equipment	/	PP
/10/	Statistical Bureau of Hui Xian City	Biomass resources survey report for year 2018	16-March-2018	
/11/	Project Owner	Statement of no double counting issued by the Project Owner	08-Oct-2021	PP
/12/	Project Owner	Labor contracts and payroll to employees	/	PP
/13/	MEE	2019 Baseline Emission Factors for Regional Power Grids in China	http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/t20201229_815386.shtml	Others

/14/	CDM-EB	Methodology ACM0006	Version 15.0	Others
/15/	CDM-EB	Combined tool to identify the baseline scenario and demonstrate additionality	Version 07.0	Others
/16/	CDM-EB	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	Version 03.0	Others
/17/	CDM-EB	Project and leakage emissions from transportation of freight	Version 01.1.0	Others
/18/	CDM-EB	Project and leakage emissions from biomass	Version 04.0	Others
/19/	CDM-EB	Tool to calculate the emission factor for an electricity system	Version 07.0	Others
/20/	CDM-EB	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	Others
/21/	Verra	VCS standard	Version 4.1 Dated 22/04/2021	Others
/22/	Verra	VCS Project Description template	Version 4.0 Dated 19/09/2019	Others
/23/	IPCC	IPCC Fifth Assessment Report	AR5	Others
/24/	IPCC	2006 IPCC Guideline	/	Others
/25/	China Government	China Energy Statistical Yearbook	2018	Others
/26/	China Government	China Electric Power Yearbook	2016-2018	Others
/27/	China Standard	Technical Administrative Code of Electric Energy Metering	DL/T 448-2016	Others
/28/	China Government	China cap & trade scheme	http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html	Others
/29/	China Government	Enforced company list	http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf	Others

APPENDIX D: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUEATS AND FORWARD ACTION REQUESTS

Draft report clarifications and corrective action requests by validation team	Summary of project participant response	Validation team conclusion
CAR-1: In section 3.1 of the PD, the tool 16 is missing.	The tool 16 Project and leakage emissions from biomass, Version 04.0 has been added in the updated PD.	CCSC has validated the revised PD and can confirm that the tool is added accordingly CAR-1 is closed out.
CAR-2: In section 3.2 of the PD, the demonstration of applicability of tools are not listed completely, only one tool is clarified.	In section 3.2 of the PD, the demonstration of applicability of missing tools has been added in the updated PD.	CCSC has validated the revised PD and can confirm that the added demonstration of applicability of missing tools is correct and reasonable and it is confirmed that all the tools are applicable. CAR-2 is closed out.
CL-1: In section 3.2 of the PD, the demonstration of applicability condition 3 is not related the request of the methodology.	The demonstration of applicability condition 3 has been revised in the updated PD.	CCSC has validated the revised PD and can confirm that the demonstration of applicability condition 3 is correct and reasonable. CL-1 is closed out.
CL-2: In section 3.2 of the PD, the demonstration of last applicability condition of Tool "Tool to calculate the Emission Factor for an Electricity System" is not related the request of the tool.	In section 3.2 of the PD, the demonstration of last applicability condition of Tool "Tool to calculate the Emission Factor for an Electricity System" has been revised in the updated PD.	CCSC has validated the revised PD and can confirm that the demonstration of last applicability condition of the tool is correct and reasonable. CL-2 is closed out.

CL-3: In section 4.3 of the PD, the demonstration leakage is not in line with the request of methodology.	In section 4.3 of the PD, the demonstration leakage has been revised in the updated PD.	CCSC has validated the revised PD and can confirm that the demonstration of leakage is in line with the applied methodology. CL-3 is closed out.