



Verified Carbon Standard

GUIZHOU JINYAN CMM POWER GENERATION PROJECT



Document Prepared by TÜV NORD CERT GmbH

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Prepared By	TÜV NORD CERT GmbH
Contact	TÜV NORD CERT GmbH JI/CDM Certification Program Am TÜV 1 45307 Essen, Germany Phone: +49-201-825-3335

	Fax: +49-201-825-3290 www.tuev-nord.de Contact Email: operations.carbon@tuev-nord.de
Approved By	Kunal Rami
Work Carried Out By	Zhao Xuejiao (TL& validator/verifier) Kunal Rami(TR), Rainer Winter (TR)

Summary:

- *A description of the project*

The project activity developed in Fengshan township, Dafang County, Bijie City, Guizhou Province, P. R. China, is a Coal mine Methane Power Generation Project. It utilizes the coal mine methane (CMM) with low methane concentration extracted from Jinyan coal mine located in Fengshan township, Dafang County to generate electricity for captive use by coal mine and supply electricity to CSPG if surplus. The CMM power generation units were installed with a total installed capacity of 4.8 MW (8*0.6MW), destroying estimated 8.7936 million m³ of methane annually and the estimated annual exported electricity will be 24,816 MWh. The project is expected to achieve 160,655 tCO₂e of emission reduction annually. The project started construction on 20-August-2019 and started operation on 01-October-2020, it was allocated with VCS ID 2895.

- *A description of the validation and verification*

The approved CDM methodology ACM0008 "Abatement of methane from coal mine" (version 08.0) is applied to quantify the GHG removals achieved in this project. The calculation of the project emission removals is carried out in a transparent and conservative manner. This project is being developed in conjunction with the validation and 1st periodic of verification.

- *The purpose and scope of validation and verification*

The validation objective is an independent assessment by a Third Party of a project activity against all defined criteria set for the registration under the VCS. In order to confirm that the project activity, as documented, is sound reasonable and meets the identified criteria, the validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and likelihood that methods a procedures set out in the project description will generate verifiable GHG data and information when implemented. Validation is a requirement and is seen as necessary to provide assurance to stakeholders of the quality of project and its intended generation of VCUs. Validation is part of the VCS project cycle and will finally result in a conclusion by the executing VVB whether a project activity is valid to be submitted for registration to VCS registry.

The objective of the verification is to have an independent review ex post determination by a VVB (Validation and Verification Body) of the monitored GHG emission reductions that have occurred as a result of the implementation of the project activity during a defined monitoring period.

- *The method and criteria used for validation and verification*

Validation and Verification is conducted using TÜV NORD CERT GmbH procedures in line with the requirements specified in the latest version of the VCS Validation and Verification Manual and applying auditing techniques. The validation/verification team assessed the project activity's compliance against the VCS Standard Version 4.3, the selected CDM methodology and tools and the project description and monitoring report. The project is eligible under Project Scope 1 and 8. The validation/verification criteria followed the guidance documents provided by VCS included the following:

VCS Standard Version 4.3, VCS Program Guide Version 4.2 and the applied CDM methodology "Abatement of methane from coal mine" (version 08.0).

- *The number of findings raised during validation and verification*

In the course of the validation and verification, 7 Corrective Action Requests (CARs), 6 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

- *Any uncertainties associated with the validation and verification*

There are no restrictions of uncertainty for both validation and verification.

- *Summary of the validation and verification conclusions*

Climate Bridge (Shanghai) Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) validation joint with 1st periodical verification of the project, “Guizhou Jinyan CMM Power Generation Project” (VCS ID 2895) with regard to the relevant requirements of VCS Standard Version 4.3. TÜV NORD confirms all validation and verification activities including objectives, scope and criteria, level of assurance, project description, monitoring and monitoring report adhere to VCS Standard Version 4.3 and all associated updated as documented in this report, are complete.

TÜV NORD concludes that the project activity “Guizhou Jinyan CMM Power Generation Project” in China, as described in the final Project Description version and final Monitoring Report version, meets all relevant requirements for VCS validation and verification activity and correctly applied the methodology ACM0008 Version 08. Hence TÜV NORD is able to provide positive validation and verification opinion as per the requirement of VCS and further certify that the GHG emission reduction from the project during the monitoring period from 01-October-2020 to 31-December-2021 amount to 126,134 tCO₂e VCUs.

CONTENTS

1	INTRODUCTION	7
1.1	Objective.....	7
1.2	Scope and Criteria	7
1.3	Level of Assurance	8
1.4	Summary Description of the Project	8
2	VALIDATION AND VERIFICATION PROCESS	10
2.1	Method and Criteria.....	10
2.2	Document Review	10
2.3	Interviews.....	11
2.4	Site Inspections	12
2.5	Resolution of Findings	13
3	VALIDATION FINDINGS	14
3.1	Project Details.....	14
3.2	Participation under Other GHG Programs.....	18
3.3	Safeguards	18
3.4	Application of Methodology	23
3.5	Non-Permanence Risk Analysis.....	51
4	VERIFICATION FINDINGS	52
4.1	Accuracy of GHG Emission Reduction and Removal Calculations.....	52
4.2	Quality of Evidence to Determine GHG Emission Reductions and Removals.....	57
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals.....	58
5	VALIDATION AND VERIFICATION CONCLUSION	59
	APPENDIX 1: ABBREVIATIONS	61
	APPENDIX 2: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS	62
	APPENDIX 3: DOCUMENTS REVIEWED OR REFERENCED	64

APPENDIX 4: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS	71
APPENDIX 5 MONITORED PARAMETERS.....	78
APPENDIX 6: CALIBRATION DATES AND VALIDITY OF INSTALLED MONITORING EQUIPMENT	90
APPENDIX 7: ASSESSMENT OF FINANCIAL PARAMETERS.....	91

1 INTRODUCTION

1.1 Objective

Climate Bridge (Shanghai) Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) validation joint with 1st periodical verification of the project for the monitoring period from 01-October-2020 to 31-December-2021 (both days included).

The objective of validation is an independent assessment by a Third Party of a project activity against all defined criteria set for the registration under the VCS. In order to confirm that the project activity, as documented, is sound reasonable and meets the identified criteria, the validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and likelihood that methods and procedures set out in the project description will generate verifiable GHG data and information when implemented. Validation is a requirement and is seen as necessary to provide assurance to stakeholders of the quality of project and its intended generation of VCUs. Validation is part of the VCS project cycle and will finally result in a conclusion by the executing VVB whether a project activity is valid to be submitted for registration to VCS registry.

The objective of verification is to have an independent review ex-post determination by a VVB of the monitored GHG emission reductions that have occurred as a result of the project activity implemented during a defined monitoring period. The evaluation is done against the requirements of the VCS Standard Version 4.3 based on the monitoring report. In order to confirm that the GHG emission reductions sound reasonable and meet the identified criteria, the verification involves the assessment of monitoring plan conformance to VCS rules and applied methodology. Verification is a requirement and is seen as necessary to provide assurance on the generation of VCUs.

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the project design document (PD) to validate that (a) the project design is actual, (b) the baseline scenario is correctly defined as per the applied methodology and related tools, (c) the project is additional, (d) the monitoring plan can be implemented and is transparent and adequate and (e) all data and information used for ex-ante calculation of emission reductions is of projected and/or hypothetical nature. The Joint-PD-MR is reviewed against the criteria stated in VCS Standard Version 4.3 and the approved baseline and monitoring methodology ACM0008 version 08.0. The validation was based on the requirements VCS Validation and Verification Manual and VCS program definitions and standards version 4.3 applying auditing techniques. The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

The scope of the verification is to verify that: (a) the actual monitoring system and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; (b) the GHG

emission reductions data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reductions data are free from material misstatement; (c) the reported GHG emissions data is sufficiently supported by evidence. Verification shall ensure that the reported GHG emission reductions are complete and accurate in accordance with the applicable VCS criteria in order to be certified. Verification is conducted using TÜV NORD procedures in line with the requirements specified in the VCS Program and ISO14064-3 requirements and applying auditing techniques. The verification team assessed and determined that the implementation and operation of the project activity, and steps to report GHG emission reductions comply with the VCS rules. The verification involved a document review of relevant documentation and interview with the project participants. Verification is not meant to provide any consultancy towards the project participants; however, stated request for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

1.3 Level of Assurance

All GHG sinks, sources and GHG emissions equal to or greater than 2% of the total GHG assertions are considered. The project is expected to generate average of 160,655 VCUs per year, and therefore can be considered as a project per the VCS rules, in regards to its scale, subject to a 2% materiality threshold. The assessment was conducted to provide a reasonable level of assurance of compliance against the defined audit criteria and materiality threshold within the audit scope. Based on the audit findings the validation and verification statement reasonably assure that the GHG assertion is materially correct and is a fair representation of the GHG data and information.

1.4 Summary Description of the Project

The project is implemented by Guizhou Jinyan Energy Technology Co., Ltd. and it aims to utilize the coal mine methane (CMM) with low methane concentration extracted from Jinyan coal mine to generate electricity for captive use by coal mine which is confirmed by checking the Jinyan CMM Gas Cooperative Development and Utilization Agreement signed between project owner and coal mine/^{GCA}/ and surplus electricity is supplied to China Southern Power Grid (CSPG) which is confirmed by checking the Power Purchase Agreement signed between project owner and grid company/^{PPA}/. The CMM power generation units will be installed with a total installed capacity of 4.8 MW (8*0.6MW), destroying estimated 8.7936 million m³ of methane annually and the expected annual exported electricity will be 24,816 MWh. No coal bed methane (CBM) or ventilation air methane (VAM) utilization is involved in the project/^{FSR}/ and it is located inside the Fengshan township, Dafang County, Bijie City, Guizhou Province, China.

The net electricity supplied to the coal mine for captive use and surplus supplied to CSPG, replaces the equivalent amount of electricity that would have been purchased from the CSPG. Waste heat from the generators has been recovered to provide heat to the coal mine. Emission reductions due to heat replacement are not claimed, it is confirmed as conservative.

The baseline scenario is the same to the status prior to the implementation of the project, i.e. Jinyan coal mine were equipped with CMM extraction facilities and all extracted CMM was vented into the atmosphere directly; the electricity consumed at the coal mine was imported from China Southern Power Grid (CSPG); the heat was provided by waste coal fired boilers.

In the monitoring period from 01-October-2020 to 31-December-2021, total 4,654.77 tCH₄ was captured and utilized and the net electricity supplied to the Jinyan coal mine for captive use and supplied to grid is totally 18,071.580 MWh. The total verified carbon units (VCUs) achieved in the monitoring period are 126,134 tCO_{2e}, which has been verified by on-site inspection, and checking the related documentations, interview with the project implementer.

The project activity generates GHG emission reductions by utilizing the low concentration coal mine methane (CMM), that otherwise would be vented into the atmosphere directly and generates electricity to supply to the coal mine that displace part of the electricity generated by the grid which is dominated by fossil fuel-fired power plants. Thus the project generates GHG emission reductions and produces financial, social and environmental benefits. The project has resulted in the local sustainable development as described in the Joint-PD-MR/^{JPM}/.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

A project specific validation and verification plan was developed to guide the validation and verification auditing process to ensure efficiency and effectiveness.

The purpose of the validation and verification is to present a risk assessment for determining the nature and extent of validation and verification procedures necessary to ensure the risk of auditing error is reduces to a reasonable level. According to the ISO14064-3, the criteria are the policy, procedure or requirement used as reference against which evidence is compared. Therefore, validation of the project description and verification of the monitoring plan and the reported project results were measured for compliance against the following criteria:

- VCS Standard, v4.3/^{VCSS/}
- VCS Program Guide, v4.2/^{VCSPG/}
- VCS Program Definitions, v4.2/^{VCSPD/}
- VCS-Joint-Project-Description-Monitoring-Report-Template-v4.1/^{JPMT/}

The validation and verification process derived from all items in the validation and verification criteria stated above. Field inspection and techniques based on the project parameters, scope and best professional judgement of the validation and verification team in order to meet a reasonable level of assurance. The validation and verification consisted of the following three phase:

- Document review
- On-site assessment
- The resolution of outstanding issues and the issuance of the final validation and verification report and certification.

The validation and verification process derived from all items in the validation and verification criteria stated above. Field inspection and techniques based on the project parameters, scope and best professional judgement of the validation and verification team in order to meet a reasonable level of assurance.

There is no sampling approach utilized by PP and VVB during validation and verification.

2.2 Document Review

The Joint-PD-MR/^{JPM/} and supporting background documents related to the project implementation were reviewed. Documents review was conducted to ensure consistency with and identify any deviation from VCS program requirements. Desk review included an examination of the project design details, baseline scenario, additionality, ex ante and monitoring data and parameters, and quantification of GHG emission reductions.

Furthermore, the validation and verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design details, baseline scenario, additionality, monitoring or to the basic conditions and technical data.

The references used in the course of this validation and verification are summarized in Appendix 3.

The validation and verification were performed basing on the documents check and site inspection/measurements, refer to the section 3 and 4 of this report for the validation and verification process detail and corresponding documents review.

2.3 Interviews

The objective of the interview process was to solicit important information from personnel related to project and relevant to the validation and verification process. Onsite interviews and information discussions were conducted with representatives from project implementer^{/11/}, local officer from EPB^{/12/}, local residents^{/13/} and Project VCS development consultant^{/14/}. The interviews were performed by the validation and verification team on-site (within the project area, in Fengshan township, Dafang County, Bijie City, Guizhou Province, P.R. China) and the following is a list of the main interviewees and subject.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Zhu ^{/11/}	Kunlei	Guizhou Jinyan Energy Technology Co., Ltd./General Manager	29-March-2022	- General aspects of the project - Changes since validation / previous verifications - Calibration procedures - Power generation situation - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - Procedural aspects of the verification - Maintenance - Environmental aspects - Project ownership	Zhao Xuejiao
2.	Wei ^{/11/}	Rong	Guizhou Jinyan Energy Technology Co., Ltd./Plant chief	29-March-2022		
3.	Gao ^{/11/}	Ji	Guizhou Jinyan Energy Technology Co., Ltd./Operation Staff	29-March-2022		
4.	Wang ^{/11/}	Yulin				
5.	Wen ^{/11/}	Jiao				
6.	Yang ^{/12/}	Chunsheng	Dafang County Environment Protection Bureau/	29-March-2022	- Local stakeholder communication - Stakeholder comments - Environmental aspects	Zhao Xuejiao

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
			Supervision team leader		- Environmental protection Measurements	
7.	Wen/ ^{12/}	Li	Local resident	29-March-2022	- Local stakeholder communication - Stakeholder comments	
8.	Tang/ ^{13/}	Qin				
9.	Mao/ ^{13/}	Kaimei				
10.	Su/ ^{13/}	Yanxiang				
11.	Chen/ ^{14/}	Genrong	Climate Bridge (Shanghai) Ltd./Project Manager	29-March-2022	- Financial aspects - Deviations - Monitoring period - Project activity starting date - Assumptions - Monitoring plan and implementation - Monitoring measurements - Editorial issues of the VCS MR	Zhao Xuejiao

2.4 Site Inspections

The validation and verification site inspection was conducted on 29-March-2022. A ground inspection of the project plan was conducted during the site visit and the validation and verification team interviewed project implementer representatives and operation staffs.

During the site inspection, the plant was inspected and documents evidence were checked, details as following table,

Duration of on-site inspection: 29-March-2022				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting Interview with PP Representative, CMM plants Operation Staff and local stakeholders	Office of Project Owner in Fengshan township, Dafang County, Bijie City, Guizhou Province, P.R. China	29-March-2022	Zhao Xuejiao
2	On-site inspection	CMM plant in Fengshan township, Dafang County, Bijie City, Guizhou Province, P.R. China	29-March-2022	Zhao Xuejiao
3	Documents check	Office of Project Owner in Fengshan township, Dafang County, Bijie City, Guizhou Province, P.R. China	29-March-2022	Zhao Xuejiao
4	Finding Summary	Office of Project Owner in Fengshan township, Dafang County, Bijie City, Guizhou	29-March-2022	Zhao Xuejiao

		Province, P.R. China		
5	Close Meeting	Office of Project Owner in Fengshan township, Dafang County, Bijie City, Guizhou Province, P.R. China	29-March-2022	Zhao Xuejiao

2.5 Resolution of Findings

Material discrepancies identified in the course of the validation and verification are addressed either as CARs, CLs or FARs.

A Corrective Action Request (CAR) is established where:

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

The VCS Standard Version 4.3 requirements have not been met;

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

A Clarification Request (CL) will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A Forward Action Request (FAR) will be issued when certain issues related to project implementation should be reviewed during the next verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this validation and verification is included in Appendix 4 of this report.

In the course of the validation 7 Corrective Action Requests (CARs), 6 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

2.5.1 Forward Action Requests

No FAR has been raised.

This is the joint validation and 1st VCS verification, thus there is no FAR raised previously.

3 VALIDATION FINDINGS

3.1 Project Details

- Project type, technologies and measures implemented, and eligibility of the project

Through the onsite visit, interviewing the project owner and reviewing the project design/^{FSR}/, it was confirmed that the project is implemented to generate electricity using low concentration coal mine methane (CMM) from coal mine and replace the electricity which would otherwise be generated by grid connected power plants. Therefore, it was confirmed that the sectoral scope is scope 01: Energy industries (renewable - / non-renewable sources) and scope 08: Mining/mineral production as per the UNFCCC Standard “Applicability of sectoral scopes version 01.0”/^{SASS}/. It was confirmed that the project is not a grouped project.

The information and descriptions reported in section 1.1 of the VCS Joint-PD-MR/^{JPM}/ have been checked.

Guizhou Jinyan CMM Power Generation Project (hereinafter referred to as the Project) is a Coal mine Methane Power Generation Project, utilizes the coal mine methane (CMM) with low methane concentration less than 30% extracted from Jinyan coal mine to generate electricity for coal mine captive use/^{GCA}/ and to China Southern Power Grid (CSPG) if there is any electricity surplus/^{PPA}/.

The Project is located in Fengshan township, Dafang County, Bijie City, Guizhou Province, China. The Project includes one coal mine (Jinyan). No coal bed methane (CBM) or ventilation air methane (VAM) utilization is involved in the project. In accordance with the Joint-PD-MR, there are total 8 sets (8*0.6MW) of CMM power generators with the total installed capacity of 4.8 MW will be installed to utilize CMM for power generation.

Via checking the Joint-PD-MR/^{JPM}/, it is confirmed that the scenario existing prior to the implementation of the project as stated in the Joint-PD-MR is Jinyan coal mine was equipped with CMM extraction facilities and all extracted CMM was vented into the atmosphere directly; the electricity was supplied from China Southern Power Grid (CSPG), that is dominated by fossil fuel-fired power plants; the heat was provided by waste coal boilers. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, which has been confirmed during the site interview with PP and checking the CMM extraction record for the Jinyan coal mine/^{CER}/ and records of electricity purchased from the grid by coal mine/^{SEP}/. Thus it is verified that the baseline scenario is reasonable and correct.

The project activity generates GHG emission reductions by utilizing the low concentration coal mine methane (CMM), that otherwise would be vented into the atmosphere directly and generate electricity to supply to the coal mine displace part of the electricity generated by the grid which is dominated by fossil fuel-fired power plants thus generating GHG emission reductions and produce financial, social and environmental benefits. The waste heat from the generators will be recovered by waste heat boilers to provide free hot water to the coal mine, which was provided by waste coal fired boilers before the implementation of the Project. However, to be conservative, emission reductions related to heat will not be claimed for this part.

The expected total emission reduction of the Project in the crediting periods of 10 years (from 01-October-2020 to 30-September-2030) is 1,606,550 tCO_{2e}, and the annual emission reduction is estimated to be 160,655 tCO_{2e}.

In conclusion, it is verified that the summary description of the project in section 1.1 is in line with the Joint-PD-MR template requirements and all the information has been provided and verified as correct.

The PP has described and justified how the project is eligible under the scope of the VCS Program in Joint-PD-MR as per the section 2.1.1 of VCS Standard Version 4.3. The assessment is provided as below,

1. The project activity generates GHG emission reductions including CO₂ and CH₄ which belong to the six Kyoto Protocol greenhouse gases.
2. “The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction.” Via checking the Joint-PD-MR of the project, it is verified that the project is implemented to generate electricity using low concentration coal mine methane (CMM) from a coal mine and replace the electricity which would otherwise be generated by grid connected power plants, and the additionality is verified as actual, thus there is no assumption of having generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction for this project.
3. The VCS Program also excludes the following project activities under the circumstances indicated in Table 1 of section 2.1.1 of VCS Standard Version 4.3, via checking all the excluded project activities in the table, it is verified that this project type is not excluded by the scope of VCS program.

In conclusion, the project is eligible to the scope of the VCS Program.

- Project design, including eligibility criteria for grouped projects

The project has been designed to include a single installation of an activity, not multiple project activity instances or as a grouped project.

- Project proponent and other entities involved in the project

The project proponents Guizhou Jinyan Energy Technology Co., Ltd. and the contact information reported in section 1.5 of the VCS Joint-PD-MR have been confirmed to be correct through checking the business license of the company/^{BL/}, the Project approval/^{AP/} and interviewing with the PP representative through the on-site visit/^{I1/}.

The other entities involved in the Project (Climate Bridge (Shanghai) Ltd.) and the contact information reported in section 1.6 of the VCS Joint-PD-MR have been confirmed to be correct through checking the business license of the Climate Bridge (Shanghai) Ltd./^{BL/} and interviewing the representative of this company during the on-site visit/^{I1/}.

- Ownership

The section 1.7 of the Joint-PD-MR has been checked, it is confirmed that the Project Proponent demonstrates that they have the legal right to control and operate project activity.

Via checking the National legal approval to the Environmental Impact Assessment (EIA)/^{AEIA/}, Project approval/^{AP/}, and the business license of the project owner/^{BL/}, it is verified that the PP has the legal right to control and operate the project activity. Furthermore, cross checking the Equipment purchase

contract/^{EPC}/, and the power purchasing agreement/^{PPA}/, it is verified that the ownership of the plants, equipment and power generating is with Guizhou Jinyan Energy Technology Co., Ltd..

Thus, it is confirmed that the project owner has the ownership of the project.

- Project start date

The project start date is 01-October-2020 which is verified as the date when the first CMM generator began generating GHG emission reductions or removals as per the concept in VCS Standard Version 4.3.

Via checking the operation log/^{LOG}/ and record of started construction and operation/^{RSCO}/, it is verified that the start date is correct and in line with the VCS standard.

- Project crediting period

For the VCS crediting period, PP has chosen 10 years fixed crediting period started from 01-October-2020 to 30-September-2030 which is in line with the concept for crediting period in section 3.8.1 of the VCS standard 4.3.

- Project scale and estimated GHG emission reductions or removals

The average annual ERs of the project are 160,655 tCO₂e, which is lower than the threshold of large-projects (300,000 tCO₂e per year). Therefore the project falls in the category of Project” as per definition in VCS standard. And the estimated total Estimated GHG Emission Reductions or Removals during the VCS crediting period (01-October-2020 to 30-September-2030) is 1,606,550 tCO₂e.

- Project location

The project site is located in Fengshan township, Dafang County, Bijie City, Guizhou Province, People’s Republic of China. Its geographical coordinates are E105°45’6”, N27°15’45”. The location of the project site is verified as consistent with on-site investigation by GPS devices.

- Conditions prior to project initiation

There is no power plant existing prior to the project at the project site, the project is the installation of new CMM extraction and power grid connected plant. The conditions prior to project initiation has been validated in the Joint-PD-MR to be the same as the baseline scenario identified in the Joint-PD-MR, i.e., 1) all the low concentration CMM extracted from the Jinyan coal mine in the Project would be vented into the atmosphere; 2) the CSPG provided the equivalent amount of electricity produced by the Project (as discussed above, the electricity generated by the Project will only replace electricity from CSPG) and 3) heat was provided by waste coal boilers (emission reductions due to heat replacement will not be claimed).

The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, which has been confirmed during the site interview with PP and checking the CMM extraction record for the Jinyan coal mine/^{CER}/ and records of electricity purchase from the grid by coal mine/^{SEP}/. Thus it is verified that the baseline scenario is reasonable and correct.

Therefore, the project is confirmed not to be implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction.

- Project compliance with applicable laws, statutes and other regulatory frameworks

The Joint-PD-MR has stated that the project is in the field of Mining/mineral production and the CMM extraction is confirmed as in line with the Renewable Energy Law and Regulations/^{L&R/}, Guidance Catalogue for the Development of Renewable Energy Industry/^{L&R/}, Opinions of the General Office of the State Council on Further Accelerating the Extraction and Utilization of Coalbed Methane (Coal mine Gas)/^{L&R/}, Notice of the National Development and Reform Commission on the issuance of the twelfth Five-Year Plan for The Development and Utilization of Coalbed Methane (Coal mine Gas)/^{L&R/} and Chinese National Coalmine Safety Regulation (valid in 2016)/^{CSR/}. For the power generation to the coal mine, via checking the power purchasing agreement/^{PPA/}, it is verified that the power generation and supply in line with the requirement of national laws and regulations as stated in the PPA/^{PPA/}. Also the project is legally approved by Local government by checking the Project approval/^{AP/}, which means that the project is in line with the national and local laws and regulations based on the local expertise of the VVB.

In conclusion, the project complies with all relevant local, regional and national laws, statutes and regulatory frameworks in China.

- Participation under other GHG programs:
- Projects registered (or seeking registration) under other GHG program(s)

The project has neither been registered nor seeking registration under any other GHG programs which has been confirmed via checking the UNFCCC/^{unfccc/}, GS/^{gs/}, VCS/^{vcs/} and other GHG schemes' website. It is verified that the project is seeking registration only in VCS program/^{vcs/}.

- Rejection by other GHG programs

The project has neither been rejected by any other GHG programs which has been confirmed via checking the UNFCCC/^{unfccc/}, GS/^{gs/}, VCS/^{vcs/} and other GHG schemes' website.

- Other forms of credit:
- Emissions trading programs and other binding limits

The project proponent is not part of any emission trading program which has been confirmed via checking the UNFCCC/^{unfccc/}, GS/^{gs/}, VCS/^{vcs/} and other GHG schemes' website. The net GHG emission reductions from the project will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions. The project activity has not participated under any other GHG programs which has been confirmed via checking the UNFCCC/^{unfccc/}, GS/^{gs/}, VCS/^{vcs/} and other GHG schemes' website.

Furthermore, based on validation and verification team's local expertise, China has a national emissions trading scheme only cover the high-emission industries, such as power generation sector that emitted at least 26,000 tons of CO₂e/year which has been verified in the public website/^{cets/}, and it is confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/^{ecl/}. Hence, it is confirmed that the emission reductions will not be double counted.

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

Via interview with the project owner/^{11/} and based on above assessment, it is confirmed that the project has not created any other form of environmental credit.

- Additional information relevant to the project, including:
- Leakage management

According to the applied methodology ACM0008 (Version 08)/ACM0008/ and the demonstration in the Joint-PD-MR and section 4.4.5.3 of this report, the leakage of the project is zero. Thus no management involved.

- Commercially sensitive information

It is confirmed that no commercially sensitive information relevant to the project description has been excluded from the public version of the project description.

- Sustainable development

Via on-site inspection, checking the evidence provided as below and interview with the project implementer, it is verified that the project contributes the sustainable development through the following aspects:

1. *The project activity creates new job opportunities and contributing to local economic prosperity (Goal 8 of UN SDG) – verified by interview with staffs and checking the Labor Contracts/LC/ and monthly payroll/PAY/, it is confirmed that 22 job opportunities have been provided during this monitoring period, hence the contribution to this SDG has been confirmed and the provisions for monitoring and reporting this goal is verified as reasonable;*
2. *The project reduces the CO₂ emission per ton of coal produced (Goal 9 of UN SDG) – verified by checking the coal production records for Jinyan coal mine/CPR/ and Emission Reduction Calculation sheet/XLS/, it is confirmed that 291,400 tons of coal were produced during this monitoring period, achieving GHG emission reductions of 126,134 tCO₂e, hence the Project decreased 0.32 tCO₂e emissions for each ton of coal produced compared with the baseline scenario during this monitoring period, hence the contribution to this SDG has been confirmed and the provisions for monitoring and reporting this goal is verified as reasonable;*
3. *Sequester greenhouse gas and mitigate climate changes (Goal 13 of UN SDG) – verified by checking the Emission Reduction Calculation sheet/XLS/, hence the contribution to this SDG has been confirmed and the provisions for monitoring and reporting this goal is verified as reasonable.*

Based on above assessment and demonstration, it is concluded that the description in the project description is accurate, complete, and the nature of the project is actual and understandable, and it is confirmed that the project has been implemented as described in the project description via site inspection.

CAR 01, CAR 02, CAR 03 and CAR 04 were raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.2 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs which has been confirmed via checking the UNFCCC/unfccc/, GS/gS/, VCS/vcs/ and other GHG schemes' website. It is verified that the project is seeking registration only in VCS program/vcs/.

3.3 Safeguards

3.3.1 No Net Harm

In China, an Environmental Impacts Assessment is required according to Chinese legislation. The EIA of the project was designed by Beijing Gongda Zhiyuan Technology Development Co., Ltd./^{EIA/} and approved by Dafang County Environment Protection Bureau (EPB)/^{AEIA/}. The analysis of the environmental impacts of the project activity is sufficiently described according to EIA report/^{EIA/}. The assessment is as below,

It is considered that the environmental impacts and the relevant mitigation methods have been comprehensively described in Section 2.1 and 2.3 of Joint-PD-MR including the air pollution and wastewater, noise, and solid waste impact on the ecosystem and environment of local area in project site according to the EIA report/^{EIA/}.

Associated with the review of EIA report/^{EIA/}, there was no adverse effect on the ecology, air, water and solid waste, for the project subject to the implementation of pollution mitigation measures according to the EIA report/^{EIA/}. There was also no any endangered species found in the project location.

As per the approval of EIA/^{AEIA/}, it stated that the inspectors from the EPB have to carry out monitoring work for the environmental impact arisen from the project activity during CMM power plant commissioning periodically. Via interview with the local officer from EPB/^{12/}, it is confirmed that they are satisfactory with the environmental protection and recovery work carried out by the project owner. The EPB also did not receive any public comment on the project activity during this monitoring period.

During the on-site interview, the local residents/^{13/} were interviewed if there was critical impact to their living environment. It is verified that the project activity does not cause adverse effect to their daily life.

Furthermore, via interview with local officer and stakeholders, it is confirmed that the implementation of the project will improve local socio-economic development through creating career opportunities and paying taxes to local government.

In conclusion, there were some impacts on environment during the construction and operation periods which has been demonstrated in the Joint-PD-MR/^{JPM/} and EIA/^{EIA/}, also the proper measurements have been carried out by project implementer to mitigate such impacts.

3.3.2 Local Stakeholder Consultation

PP has demonstrated the local stakeholder consultation process in Joint-PD-MR and assessed as below,

The procedures or methods used for engaging local stakeholders

The personnel of the Jinyan coal mine, local villagers and government officials have been identified as the local stakeholders by PP prior to the project construction, and to gain the comments from them, PP decided to use the questionnaire survey method which has been confirmed by site interview with PP. Via checking the survey questionnaires/^{LSC/}. It is confirmed that PP conducted local stakeholder consultation by distributing survey questionnaires in June 2019 prior to the project construction and in May 2021 during the reported monitoring period with the general information about the Project. The distributing channels have been provided in the joint-PD-MR and confirmed as actual by site interview with local stakeholders. The date and the purpose of the questionnaire survey as well as the project proponent's contact methods have been clearly published on bulletin boards at Jinyan coal mine and at villages near the project site to local stakeholders and also local officers have been informed by phone which has been verified by site interview with local officers.

Hence, it is concluded that the procedures or methods have been used for engaging local stakeholders are verified as actual and reasonable.

The procedures or methods used to document the local stakeholder consultation outcomes

A stakeholder survey was carried out by the project developer in June 2019 which was prior to the start date of the construction.

Survey questionnaires were distributed to relevant personnel of Jinyan coal mine, local villagers and government officials by the Project owner on 12-June-2019. Totally 50 copies of questionnaires were issued to relevant personnel of Jinyan coal mine, local villagers and government officials with 50 pieces of reply received. The stakeholders' background information and comments from questionnaires were summarized and recorded in the Joint-PD-MR, Section 2.2.

Via checking the 50 filled questionnaires/^{LSC/}, it is verified that all respondents know or heard about the Project. Most of them are supportive of the project construction, and think the Project will bring more benefit than loss. 92% of the respondents are willing to participate in the construction and operation of the Project, 94% of the respondents believe that the Project will not have any environmental impact, 92% of the respondents recognize the positive impact of the Project on individuals and families and 94% of the respondents consider the Project improve the operational safety of the coal mine to some extent.

No one thinks that the Project will have a negative impact on the local environment.

Therefore, it is verified that there is no one thinks that the Project will have a negative impact on the local life, local stakeholders are supportive of the project construction by checking the questionnaires/^{LSC/}, and thus no need to change the project design based on the stakeholder inputs.

During the implementation stage of this monitoring period, via checking the local communication survey records/^{LCSR/} and interview with the local officer/^{I2/} and local residents/^{I3/} during site visit, it is confirmed that the local authority has conducted follow-up interviews with the residents around the project site through inform door-to-door and ongoing communication with local stakeholders to collect any comments or inputs to the project implementation. Based on the VVB's local expertise, it is confirmed that the local government agencies and competent authorities will conduct spot checks on the implementation of the project from time to time as per the request from the local government's regulations.

Moreover, the project owner carried out a questionnaire survey for the local stakeholder to collect the relevant comments and suggestions on 25-May-2021 during this 1st monitoring period. Besides, during the survey process, the PP also informed the respondents that they would be able to contact the project proponent directly by phone or by email should they have any concern over the environmental impact during the project implementation which has been confirmed by site interview with local stakeholders and local officers.

Via checking the filled 30 questionnaires/^{LSCR-M/}, interview with the local officer and local resident during site visit, it is verified that all of the respondents expressed their support towards the project.

No negative comments were received for the project but some concerns including protection measurements and security of the power station were raised by local stakeholder and the developer have paid attention and solve these issues which have been confirmed by checking the filled 30

questionnaires/^{LSCR-M/} and confirmed by site interview with local stakeholders. And via checking the filled 30 questionnaires/^{LSCR-M/}, it is confirmed that no one thinks that the Project will have a negative impact on the local life.

The mechanism for ongoing communication with local stakeholders

Via above assessment, it is confirmed that not only the questionnaire surveys took place regularly during the project implementation but also local stakeholders can raise their concerns and opinions directly by making a phone call (which has published on bulletin boards) to the project proponent. Furthermore, PP has informed the local authorities of key implementation events or changes of the project and local government agencies is in charge of supervising the project implementation on a regular basis which has been confirmed by site interview with local officers.

How due account of all and any input received during the consultation has been taken

As assessed above, project owner has brought up with corresponding approaches to minimize the impact of the project on the environment and related mitigative actions have been carried out, hence, it is concluded that all the Project Owner has taken necessary measures to the inputs received. All the mitigation actions have been verified by interview with local officer, the local officer from Dafang County Environment Protection Bureau (EPB)/^{12/} has confirmed that the project was under supervised and the implementation of the project is in line with the local environment protection regulations and EIA/^{EIA/}.

Furthermore, via interview with the local officer/^{12/} and local residents/^{13/} during site visit, it is verified that there were no comments and issues from the local stakeholders during the construction and implementation period and the project passed all the periodic spot checks by local government. Hence there is no need to change the project design based on the stakeholder inputs.

CL 01 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.3.3 Environmental Impact

In China, an Environmental Impacts Assessment is required according to Chinese legislation. The EIA was designed by Beijing Gongda Zhiyuan Technology Development Co., Ltd./^{EIA/} and approved by Dafang County Environment Protection Bureau /^{AEIA/}. The analysis of the environmental impacts of the project activity is sufficiently described according to EIA reports/^{EIA/}. The assessment is as below,

It is considered that the environmental impacts and the relevant mitigation methods have been comprehensively described in Section 2.3 of Joint-PD-MR including the air pollution and wastewater, noise, solid waste and impact on the ecosystem in local area of project site according to the EIA report/^{EIA/}.

The environmental impacts of the project were sufficiently assessed by means of an Environmental Impact Assessment (EIA) study report according to the Chinese laws & regulations such as “Environmental Protection Law of P.R. China”/^{L&R/} and “Law of the People's Republic of China on the Environmental Impact Assessment”/^{L&R/}. The environmental impact assessment report was completed by Beijing Gongda Zhiyuan Technology Development Co., Ltd./^{EIA/}. The EIA report/^{EIA/}, which was approved by Dafang County Environment Protection Bureau (EPB)/^{AEIA/}, was inspected by the VVB to be valid/^{AEIA/}. Every aspect of

environmental impact has been considered in the EIA report/^{EIA/} with corresponding measures during project development.

During the construction period, via interview with the local officer from EPB, it is confirmed that the potential environmental impacts have been sufficiently identified for the construction period, such as air pollution, wastewater, noise, solid waste and impact on the ecosystem etc. The conclusion of the analysis has been described in the Joint-PD-MR as per the EIA report/^{EIA/} and the related mitigation measures have been listed as per the approval of EIA report/^{AEIA/}. Due to the project has been implemented during the site inspection, it is confirmed that the impact during the construction period has been solved and no significant environmental impacts are expected from the project activity.

During the site inspection, the project was implemented normally. The validator revealed that noise during operation is generated by the low-concentration CMM generators, circulating cooling tower and pumps and the noise emission from the project operation is confirmed during site inspection, PP has taken some mitigation measures including machinery are all built from reinforced concrete, with soundproof materials installed inside, atop and at the openings. Mufflers and vibration damper bases have been designed for the machinery which has been verified by VVB during the site inspection, and via interview with local officer from EPB, it is verified that the noise in the project site complies with the requirements of national standard Category 2 of *Emission standard for industrial enterprise noise at boundary* (GB12348-2008)^{ESEN/} and the environmental noise at the residential settlement satisfies Category 2 of “*Environmental quality standard for noise*” (GB3096-2008)^{EQSN/}.

Associated with the review of EIA, there was no adverse effect on the ecology, air, water and solid waste, for the project subject to the implementation of pollution mitigation measures according to the EIA report/^{EIA/}. There was also no any endangered species found in the project location.

As per the approval of EIA/^{AEIA/}, it stated that the inspectors from the EPB have to carry out monitoring work for the environmental impact arisen from the project activity during CMM power plant commissioning periodically. Via interview with the local officer from Dafang County Environment Protection Bureau/^{12/}, it is confirmed that they are satisfactory with the environmental protection and recovery work carried out by the project owner. The EPB also did not receive any public comment on the project activity after the implementation of the project.

3.3.4 Public Comments

The project sought the registration with the VCS Program, according to VCS requirements the Project Description was submitted for public comment period. The project was allocated with VCS ID 2895. The public comment period started on 23-March-2022 and ended on 22-April-2022 (<https://registry.verra.org/app/projectDetail/VCS/2895>).

No comments were received during this period which has been verified by checking the dedicated website.

3.3.5 AFOLU-Specific Safeguards

N/A

3.4 Application of Methodology

3.4.1 Title and Reference

The approved consolidated methodology applied in the project activity is ACM0008 – “Abatement of methane from coal mine” (version 08.0)/ACM0008/.

This methodology also refers to the latest approved version of the following tools:

“Combined tool to identify the baseline scenario and demonstrate additionality” (version 07.0)/TBDA/;

“Tool to calculate the emission factor for an electricity system” (version 07.0)/TEF/;

“Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)/TBPL/;

“Common practice” (version 03.1)/TCP/;

“Investment analysis” (version 11.0)/TIA/.

3.4.2 Applicability

Demonstration regarding the applicability of the methodology, and any tools selected by the project proponent as provided in below table.

Table 3-1 Assessment of Applicability conditions of ACM0008

No.	Applicability conditions	Validation Assessment	Conclusion
1	This methodology applies to project activities that aim for the use and/or destruction of the methane extracted/obtained from a working or abandoned coal mine(s). The project activities include any of the following methods to treat the methane captured: (a) The methane is destroyed without energy production, for example through flaring; (b) The methane is used to produce energy. This may include electricity, heat, vehicle fuel, etc.	The project aims to use methane (CMM) extracted from working Jinyan coal mine. The methane is used for electricity generation. This situation belongs to category (b) of this requirement. This is verified by site inspection.	Applicable
2	Emission reductions can be claimed for displacing or avoiding energy from other sources;	It is confirmed that generated electricity is supplied to coal mine for displacing power purchase from grid CSPG, achieving emission reductions which will be calculated and claimed.	Applicable
3	Methane used in the project activities shall be extracted using the following techniques: (a) Surface drainage boreholes to capture coal bed methane (CBM) or methane from open cast mines;	In the project: (a) CBM is not implemented on these mines; (b) CMM are extracted by underground boreholes in the mine, surface goaf wells, underground boreholes, gas	Applicable

No.	Applicability conditions	Validation Assessment	Conclusion
	(b) Underground boreholes in the mine, surface goaf wells, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture coal mine methane (CMM); (c) Mine ventilation system to dilute and remove ventilation air methane (VAM); (d) Surface drainage boreholes in the case of sealed abandoned mines or ventilation system in the case of ventilated mines to capture abandoned mine methane (AMM).	drainage galleries or other goaf gas capture techniques, including gas from sealed areas (c) The Project does not involve VAM utilization. (d) The Project does not involve abandoned mine methane (AMM) utilization. This is verified by site inspection and checking the FSR/^{FSR}/ and FSR approval/^{AP}/. Therefore, this situation belongs to category (b) of this requirement.	
4	The remaining share of the methane, to be diluted for safety reason, may still be vented.	The remaining share of the methane is still vented into the atmosphere for safety reason. This is verified by site inspection and checking the FSR/^{FSR}/ and FSR approval/^{AP}/.	Applicable
5	In the case of open cast mines, in addition to the conditions listed above, project activities should meet the following requirements: (a) The mines should have had a working mining concession for at least three years prior to the start of project; (b) Only pre-mining drainage from wells placed within the area to be mined are eligible for crediting; (c) For the calculation of emission reductions, all provisions for CBM should be followed for the open cast mine methane.	Methane used in the Project is not from opencast mines. This is verified by site inspection and checking the FSR/^{FSR}/ and FSR approval/^{AP}/.	Not involved
6	The methodology does not apply to project activities with any of the following features: (a) Capture/use of virgin coal bed methane, e.g. methane extracted from coal seams for which there is no valid coal mining concession; (b) Use CO₂ or any other fluid/gas to enhance CBM drainage before mining takes place; (c) Methane extraction from abandoned mines that are flooded due to regulation;	In the project , no virgin coal bed methane capture, CBM drainage, and abandoned coalmine are involved. This is verified by site inspection and checking the FSR/^{FSR}/ and FSR approval/^{AP}/.	Not involved

No.	Applicability conditions	Validation Assessment	Conclusion
7	The methodology does not apply to project activities that involve use and/or destruction of CBM or OCM if the baseline scenario identification resulted in partial use and/or destruction of CBM or OCM.	In the project, no CBM or OCM use and/or destruction are involved. This is verified by site inspection and checking the FSR/ ^{FSR} / and FSR approval/ ^{AP} /.	Not involved
8	Emission reductions due to the use and/or destruction of CBM or OCM cannot be claimed if surface drainage to capture CBM or methane from open cast mine(s) is used within the project boundaries prior to the implementation of the project activity.	In the project, no CBM or OCM use and/or destruction are involved. This is verified by site inspection and checking the FSR/ ^{FSR} / and FSR approval/ ^{AP} /.	Not involved
Conclusion: Methodology ACM0008 (Version 08.0) is applicable to the project activity.			

In addition, the project meets the applicability conditions of the applied tools as follow table,

Tool	Criteria	Validation Assessment	Conclusion
(a) “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 07.0)	The tool is applicable to all types of project activities.	The tool is applicable to all types of project activities	Applicable
(b) “Tool to calculate the emission factor for an electricity system” (Version 07.0)	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 the installation of CMM power plants for power generation to supply electricity to the coal mine that would otherwise be purchased from CSPG. Therefore the tool is confirmed as applied to estimated the OM, BM and /or CM when calculating baseline emissions for the project.	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 1: Procedures	Emission factor for the project electricity system is calculated only for the grid power plants in China. Thus, this applicability criterion is satisfied.	Applicable

Tool	Criteria	Validation Assessment	Conclusion
	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 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.	The project electricity system is located in a non-Annex I country.	Applicable
	Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The calculation of the emission factor considers the emission of biofuels as zero ^{/BEF/} .	Not involved
(c) “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Version 03.0)	If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption: (a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; (b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel	For the project, emissions are calculated for electricity consumption, and the sources of electricity consumption belongs to (a) Scenario A: Electricity consumption from the grid. This is confirmed by site inspection and checking the Electricity transaction note^{/ETN/}.	Applicable

Tool	Criteria	Validation Assessment	Conclusion
	fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.		
	This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: (a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.	For the project, electricity is supplied to consumers/electricity consuming facilities in the coalmines which belongs to (c) Scenario III due to surplus electricity will be supplied to CSPG. This is confirmed by site inspection and checking the Gas Cooperative Development and Utilization Agreement/GCA/ and PPA/PPA/.	Applicable
	This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO₂ emissions.	There are no captive renewable power generation technologies installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage.	Applicable

Tool	Criteria	Validation Assessment	Conclusion
(d) Common practice (version 03.1)	This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	The project activity uses “Combined tool to identify the baseline scenario and demonstrate additionality” for additionality demonstration, thus this tool is applicable.	Applicable
	In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	ACM0008 (version 08.0) refers to “Combined tool to identify the baseline scenario and demonstrate additionality”, which required using the latest version of the “Methodological tool: Common practice” for available on the UNFCCC. Therefore, this tool is applicable.	Applicable
(e) Investment analysis” (version 11.0)	This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, the guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities”, or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.	Since the project activity uses “Combined tool to identify the baseline scenario and demonstrate additionality”, the tool is applicable.	Applicable
	In case the applied approved baseline and monitoring methodology contains requirements for the investment	ACM0008 (version 08.0) refers to “Combined tool to identify the baseline scenario and	Applicable

Tool	Criteria	Validation Assessment	Conclusion
	analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	demonstrate additionality". Therefore, this tool is applicable.	
Conclusion: All the relevant methodological tools are applicable to the project activity.			

3.4.3 Project Boundary

Based on ACM0008 (version 08.0), the Project boundary for this Project activity includes:

- The Jinyan coal mine from where the methane is extracted; It is confirmed via site inspection and checking the FSR/^{FSR/} and Approval of project/^{AP/}.
- There is no equipment installed for the CMM treatment and transportation at the project site due to these devices owned by the coal mine and are used primarily to maintain underground mining safety, i.e. they were existed in the baseline which has been verified by site inspection and checking the Gas Cooperative Development and Utilization Agreement/^{GCA/}.
- CMM power plant including CMM delivery system, power generation units and waste heat recovery units installed for electricity generation which has been verified by site inspection and checking the main Equipment purchase contract/^{EPC/} and Gas Cooperative Development and Utilization Agreement/^{GCA/}, PPA/^{PPA/}.
- All the power plants connected to the CSPG which connected to CCPG and ECPG, thus power plants connected to CSPG, CCPG and ECPG are all included in the project boundary, which has been verified by site inspection and checking "2019 Baseline Emission Factors for Regional Power Grids in China" published by DNA of China/^{BEF/}.

The main emission sources and gases included in the project boundary are determined as per the applied methodology, GHG sources included and excluded from the project boundary is defined as correct and corresponding to the actual status of the project, via on-site inspection and checking the Gas Cooperative Development and Utilization Agreement/^{GCA/}, project design/^{FSR/} and PPA/^{PPA/}, it is verified that all the relevant sources have been selected.

It is concluded that the project boundary and selected sources are correctly justified for the project.

CAR 05 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.4.4 Baseline Scenario

The Joint-PD-MR applies the stepwise approach in "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 07.0)/^{TBDA/} as approach given by section 5.1.1 of the ACM0008/^{ACM0008/}.

Step 0: Demonstration whether the project activity is the first-of-its-kind

The project activity is not the first-of-its-kind.

Step 1: Identification of alternative scenario

The Joint-PD-MR follows the methodology by listing 5 alternatives to handle methane to comply with safety regulations, 4 alternatives to deal with methane and 4 alternatives for energy production that should be considered at least. No further scenario is considered reasonable under the given context.

Only CMM is involved in the project activity and is applicable, therefore other methane gases are eliminated from the baseline determination in the Joint-PD-MR.

The alternative scenario that is economically the most attractive course of action is considered as the baseline scenario.

Step 1a: Define alternative scenarios to the project

i. ACM0008 Version 08.0 requires discussion of plausible **5 alternative scenarios to handle methane** to comply with safety regulations as the following:

- A1. Extraction of methane prior to the mining (CBM/OCM);
- A2. Extraction of methane during and after the mining (CMM);
- A3. Extraction of methane through ventilation during the mining;
- A4. Extraction of methane from the abandoned mine;
- A5. Possible combinations of options A1 to A4 with the relative shares of gas specified.

ii. ACM0008 Version 08.0 requires discussion of plausible **4 alternative scenarios to deal with methane** as the following:

- B1. Venting of methane;
- B2. Flaring of methane;
- B3. Use of methane for energy production, e.g. B3.1 electricity generation, B3.2 heat generation, B3.3 vehicle fuel or gas production.
- B4. Possible combinations of options B1 to B3 with the relative shares of gas specified.

iii. Furthermore, all possible options for electricity production at the coal mine in the project include:

- P1. Equivalent quantity of electricity supply from CSPG;
- P2. The project activity not undertaken as a VCS project activity;
- P3. Construction of a coal-fired captive power plant with equivalent power supply; or construction of a captive power plant using other fossil fuels;
- P4. Power generation using renewable energy resources e.g. hydro, solar or wind power.

Step 1b: Consistency with mandatory applicable laws and regulations

It is confirmed that any of the alternatives which are not in compliance with the relevant laws and regulations of the People's Republic of China have been eliminated, assessment is as following,

1. Eliminate options to handle methane

The latest version of national regulation of the coalmine safety "National Coalmine Safety Regulation (2016)" /CSR/ has been checked, it is confirmed that the it is not permitted to carry out pre-mining or post-mining extraction separately, the combination of the two methods must be adopted and based on the regulation, extraction of methane to avoid the risk of explosion is in line with the rules. Furthermore, due to the Jinyan coal mine is not an abandoned mine which has been confirmed by site inspection, thus, options A1, A2, A3 and A4 are excluded.

In conclusion, option A5 combinations of options A1 and A2 is confirmed as in compliance with legal and regulatory requirements after this step.

2. Eliminate options to deal with methane

According to No. 184 of the latest National Coalmine Safety Regulation (2016)^{/CSR/}, CMM with methane concentration of below 30% is forbidden to be combusted directly, but can be either vented or utilized for power generation by internal combustion engines. According to the FSR^{/FSR/}, the average methane concentration of the Project is below 30%. Hence, the project, which is a low concentration CMM power generation project, is still in compliance with the host country laws and regulations. But flaring of methane with direct combustion of methane concentration of below 30% is prohibited. Hence option B2 Flaring of methane is eliminated.

Furthermore, for option B3, Option B3.1 (use of methane for electricity generation) and B3.2 (use of methane for heat generation) comply with laws and regulations.

For methane to be used as vehicle fuel or for gas production, the extracted CMM must be purified to achieve a high methane concentration and then transported to users or to factories through a high-pressure gas pipeline network, which is, however, not available in the mountainous Pan County where the Project is located. The construction of a pipeline network would require huge investment, and such a project would have a very low IRR. It is not financially attractive to use the extracted CMM as vehicle fuel or for gas production. Option B3.3 (use of methane as vehicle fuel or for gas production) is excluded.

The heat demand of the mining area has been able to be met by the boiler of the waste heat boiler of the unit, and there is no additional heat demand, no need for additional heating, so Option B3.3 (use of methane for heat generation) is excluded.

For option B4, based on above assessment, it is confirmed that this is contradictory for methane venting and methane use for electricity, thus is excluded.

In conclusion, options B1 venting of methane and Option B3.1 and B3.2 (use of methane for electricity generation) are in compliance with legal and regulatory requirements.

3. Eliminate options for energy production

Via site inspection and checking the FSR^{/FSR/}, it is confirmed that the installed capacity of the project is 4.8 MW CMM-fired power plant. Hence, alternative P3 is eliminated which is validated to be consistent with the Chinese regulation, Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135 MW or Below issued by the General Office of the State Council, decree no. 2002-6 [Doc-32]^{/NSP/}, stipulating the prohibition of the construction of fossil fuel-fired power plants with an installed unit capacity equal to or lower than 135 MW in the areas which can be covered by large grids such as provincial grids.

In conclusion, options P1, P2 and P4 for energy production are in compliance with legal and regulatory requirements.

Finally, based on above demonstration, the baseline alternative options that are technically feasible and comply with all legal and regulatory requirements are listed below:

Scenario ID	CMM extraction	CMM treatment	Energy production
Scenario 1 A5 + B1 + P1	Combinations of A1 and A2	Venting	Equivalent quantity of electricity supply from CSPG
Scenario 2 A5 + B1 + P2	Combinations of A1 and A2	Venting	The project activity not undertaken as a VCS project activity;
Scenario 3 A5 + B1 + P4	Combinations of A1 and A2	Venting	Power generation using renewable energy resources e.g. hydro, solar or wind power
Scenario 4 A5 + B3 + P1	Combinations of A1 and A2	Use of methane for electricity production	Equivalent quantity of electricity supply from CSPG
Scenario 5 A5 + B3 + P2	Combinations of A1 and A2	Use of methane for electricity production	The project activity not undertaken as a VCS project activity;
Scenario 6 A5 + B3 + P4	Combinations of A1 and A2	Use of methane for electricity production	Power generation using renewable energy resources e.g. hydro, solar or wind power

4. Eliminate options to deal with methane

- For scenario 1, this is the continuation of business-as-usual faces no barrier. It remains as a possible baseline scenario alternative for this step.
- For scenario 2, it is verified that this scenario is a conflicted scenario for the methane is venting conflicted with methane utilized for electricity generation.
- For scenario 3 which involves power generation using renewable energy resources e.g. hydro, solar or wind power is eliminated as below reason:

There is no good solar power, hydropower, wind power and geothermal resources in the project area in mining area, which has been confirmed by site inspection and interview with local officers.

Finally, the biomass materials in project location, i.e. coal mine area is confirmed as barely for generation of electricity power based on local expertise of validation team and site inspection.

- For Scenario 4, this is a conflicted scenario for use of methane for electricity production conflicted with equivalent quantity of electricity supply from CSPG.
- For Scenario 5: This is the project activity not implemented as a VCS project. This scenario faces investment barriers, which will be discussed in below section.
- For Scenario 6: As shown scenario 3. The electricity generation using renewable energy sources in local area is facing kinds of barrier.

After the above steps, based on the scenarios not eliminated, the options to form the baseline scenario alternative that do not face barriers are verified listed as below:

Table 3-2: Baseline scenario alternatives

Scenario ID	CMM extraction	CMM treatment	Energy production
Scenario 1 A5 + B1 + P1	Combinations of A1 and A2	Venting	Equivalent quantity of electricity supply from CSPG
Scenario 5 A5 + B3 + P2	Combinations of A1 and A2	Use of methane for electricity generation	The project activity not undertaken as a VCS project activity

There are no barriers identified that would prevent the implementation of either of the two alternative scenarios above.

Step 2: Barrier analysis

Barrier analysis is not applied by the Project.

Therefore, neither of the two combined scenarios is eliminated by the step 2. The two combined scenarios need to be further discussed in Step 3 as listed in the below section 3.4.5 of this report for additionality assessment.

3.4.5 Additionality

Based on the above assessment of the baseline scenario, due to the “Combined tool to identify the baseline scenario and demonstrate additionality” is used, so the Step 1, 2 of demonstration of additionality has been assessed in the above section 3.4.4. and no need to repeat in this section.

Besides, validation team checked the timeline of the milestones of the project, PP decided the project would be developed as VCS project as assessed in the FSR/^{FSR}/ prior to the project started construction.

The first major contract signed was the Equipment purchase, signed on 05-April-2019 is verified by checking the Equipment purchase contract/^{EPC}/. This date is confirmed as the earliest date of the project owner commit to making expenditures for the construction or modification of the main equipment or facility, it is verified that the contract signed date of 05-April-2019 is the earliest date of the project owner making expenditures for the equipment. And the board meeting was held on 19-October-2018 by checking the meeting minute/^{BMM}/, it is confirmed that the VCS revenues have been seriously considered for make the investment decision.

Hence, it is confirmed that the VCS revenues have played an important role for the investment decision of the project by PP. and thus the prior consideration is verified as satisfied.

Step 3: Investment analysis

The investment analysis is conducted in the below steps following the guidance for the investment analysis in the latest approved version of the “Combined tool to identify the baseline scenario and demonstrate additionality”/^{TBDA}/, and Investment analysis (version 11.0)/^{TIA}/.

Based on above assessment, the alternative scenarios of the project include:

Scenario 1 is the business-as-usual scenario, venting CMM does not create economic benefits, but no investment required for this scenario.

Scenario 5 is CMM used for electricity generation, i.e, implement the Project without VCS.

A step-wise assessment is presented in Table below for the investment analysis for scenario 5.

Table 3-3: Investment Analysis (Refer to Appendix 7 for assessment of input values for IRR calculation)

Step	Argument by PP	Assessment of the validation team
a	Due to the two alternative scenarios remaining after step 2 as scenario 1 and 2, thus a benchmark analysis from the Investment analysis (version 11.0)^{TIA/} is used for the investment analysis. Therefore, Option III: benchmark analysis is selected for the investment analysis.	In accordance with the Additionality Tool, the option III benchmark analysis is selected.
b	The benchmark of project IRR for the construction project is 8% (after tax) referred to the “Economic Evaluation Method and Parameters for Construction Projects”^{EEMP/} is determined as the benchmark. The benchmark IRR for power generation sector projects in China is regulated as 8% of the total investment (for post-tax project IRR). The benchmark is relevant for the project activity, given that the benchmark is applicable to the power generation sector in China.	The “Economic Evaluation Method and Parameters for Construction Projects”^{EEMP/} is widely used in China for financial evaluation of power generation sector project. The choice of benchmark as 8% for newly constructed power generation project is assessed to be appropriate, since it is in compliance with national regulation and applied for many registered CDM and VCS projects in the past using meth ACM0008.
c	The project IRR post-tax (without UER revenue) is 3.44%^{IRR/} which is less than the identified benchmark of 8%.	PP has calculated IRR in spreadsheet^{IRR/} for the project activity on post-tax basis and compared the same with the benchmark 8%. PP has demonstrated that the project IRR is lower than the benchmark and hence the project is not financially attractive. The IRR calculation was reproduced by the validation team. The parameters used for the IRR calculation^{IRR/} were derived from the FSR, which was approved by local government^{AP/}. The assumptions stated in the report are assessed to be reasonable. Each parameter is assessed individually by the validators in Appendix 7 of this report. The assessment is strictly following the latest Investment Analysis (version 11.0)^{TIA/}.
d	The sensitivity analysis was demonstrated through two manners: 1. Varying $\pm 10\%$ of four critical parameters (Total static investment, Electricity tariff, Annual O&M cost, Annual electricity exported). The selection is checked as in line with the requirements in Investment analysis (version 11.0) of “Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation”, the Total static investment is checked as constitutes more	The sensitivity analysis concludes that the project activity is unlikely to be financially attractive. Threshold analysis is also used in sensitivity analysis. The sensitivity analysis was reproduced by the validation team and evaluated to be correct. The sensitivity analysis and threshold analysis of each parameter is assessed individually by the validation team in Appendix 7 of this report.

Step	Argument by PP	Assessment of the validation team
	than 20% of total project costs. The Electricity tariff and Annual Electricity exported are checked as constitute more than 20% of the total revenue of the project. The total O&M throughout the project lifetime is checked as accounts for more than 20% of the project cost. 2. Threshold analysis by varying the above four parameters to make the IRR meet benchmark 8%/IRR/. Based above, it can confirm that the financial unattractiveness of the project is robust.	

In conclusion, based on above stepwise assessments, the baseline scenario is finally determined as

Methane extraction: Combinations of methane extraction of prior to, during and after the mining, and through ventilation during the mining; Jinyan coal mine was equipped with CMM extraction facilities and all extracted CMM was vented into the atmosphere directly; The electricity consumed at coal mine was imported from China Southern Power Grid (CSPG).

It is verified that the baseline scenario is defined correct and reasonable based on the applied methodology and related tools.

The step below is used to analyze the additionality of the project by conducting an investment analysis and common practice using the related methodological tools.

Step 4: Common practice analysis

The common practice analysis was checked strictly followed Methodological tool “Common practice” (Version 03.1)^{TCP/}.

Step 1: calculate applicable capacity or output range as +/-50% of the design capacity or output of the project activity

The total installation capacity of the Project is 4.8 MW. Capacity range of +/- 50% is defined from 2.4 MW to 7.2 MW.

Step 2: identify similar projects (both CDM and non-CDM) which fulfill all of the following conditions:

- The projects are located in the applicable geographical area;
- The projects apply the same measure as the project activity;
- The projects use the same energy source/fuel and feedstock as the project activity, if a technology switch measure is implemented by the project activity;
- The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the project plant;
- The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;

- (f) The projects started commercial operation before the project design document is published for global stakeholder consultation or before the start date of project activity, whichever is earlier for the project activity.

Demonstration as follow,

- (a) The region selected for common practice of Guizhou Province is assessed as appropriate and reasonable. A province is the second administrative level of China after central government and it is authorized to execute administrative examination and approval for construction projects considering local regulations;
- (b) Same measures are defined as: projects provided power generation based on CMM
- (c) Project uses CMM;
- (d) Project with electricity generation;
- (e) Out range: capacity ranging from 2.4 MW to 7.2 MW are chosen
- (f) Commercial operation started before 20-August-2019.

Thus, the projects operated before 20-August-2019 uses CMM to generate electricity with installed capacity range from 2.4 MW to 7.2 MW in Guizhou Province are determined similar projects.

The information source China Electric Power Yearbooks/[CEPY/](#) and the website of Guizhou Provincial Development and Reform Commission/[gdro/](#), and public source/[cp/](#) for the common practice analysis is publicly available and checked by the validation team. The information used is evaluated to be credible.

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all} .

Above data source and China's DNA website/[dna/](#) and UNFCCC website/[unfccc/](#) are checked by the audit team, it is confirmed that all CMM power projects with capacity of 2.4 MW to 7.2 MW operated before 20-August-2019 in Guizhou Province are all registered as CDM/VCS/CCER projects except two cases via checking the UNFCCC/[unfccc/](#), VCS/[vcs/](#) and China CER(CCER)/[ccer/](#) public websites, hence 2 similar projects are identified. Hence $N_{all}=2$.

Step 4: within similar projects identified in Step 3, identify those that are different to the technology applied in the project activity. Note their number N_{diff} .

As per the tool of common practice, different technologies are technologies that deliver the same output and differ by at least one of the following (as appropriate in the context of the measure applied in the proposed CDM project and applicable geographical area):

- (a) Energy source/fuel;
- (b) Feed stock;
- (c) Size of installation (power capacity):
 - (i) Micro;
 - (ii) Small;
 - (iii) Large;
- (d) Investment climate on the date of the investment decision, inter alia:
 - (i) Access to technology;
 - (ii) Subsidies or other financial flows;
 - (iii) Promotional policies;
 - (iv) Legal regulations;
- (e) Other features, inter alia:

(i) Nature of the investment (example: unit cost of capacity or output is considered different if the costs differ by at least 20%);

Based on above demonstration and analysis of the two similar projects, $N_{diff} = 0$.

Step 5: calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the project activity that deliver the same output or capacity as the project activity.

For this project, $N_{all}=2$, $N_{diff}=0$, hence, $N_{all} - N_{diff} = 2$ which is less than 3.

And $F = 1 - N_{diff}/N_{all} = 1 - 0 = 1$.

Based on the common practice analysis was checked strictly followed Methodological tool “Common practice” (Version 03.1)^{/TCP/}, it can be concluded that the project is not a common practice.

Outcome of Step 4:

The project is additional.

CAR 06, CL 02 and CL 03 were raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.4.6 Quantification of GHG Emission Reductions and Removals

For validation of the estimated GHG emission reductions in the Joint-PD-MR^{/JPM/} and ER calculation sheet^{/XLS/},

Further, the validation team has downloaded from the UNFCCC website the applicable version of the CDM methodology and all referenced methodological tools^{/unfccc/}.

Via verify the Joint-PD-MR, it is confirmed the calculation of ERs is done as per the applied methodology (ACM0008 ver. 08.0) and “Tool to calculate the emission factor for an electricity system” (version 07.0)^{/TEF/} and “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)^{/TBPL/} with follow steps listed below.

The calculation of ERs is done as per the applied methodology (ACM0008, Ver.08.0)^{/ACM0008/}.

Baseline emissions:

According to the methodology, Baseline emissions would have occurred because:

- (a) Methane eligible for crediting would have been either destroyed or vented in a baseline, and
- (b) Production of power, heat and/or other forms of useful energy that is produced due to the project activity would have been produced using baseline technologies and fuels.

Hence, Baseline emissions are determined in two steps:

Step A. Determination of methane eligible for crediting;

CBM/COM/VAM/AMM is not applicable to the Project activity. Therefore, all captured CMM is eligible for the Project activity.

Step B. Determination of baseline emissions.

The following sources are applicable:

- (i) Emissions from the destruction of methane;
- (ii) Emissions from the release of methane into the atmosphere;
- (iii) Emissions from the production of power, heat or other forms of useful energy.

$$BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$$

Where:

BE_y	=	Baseline emissions in year y (t CO ₂ e)
$BE_{MD,y}$	=	Baseline emissions from destruction of methane in the baseline scenario in year y (t CO ₂ e)
$BE_{MR,y}$	=	Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (t CO ₂ e)
$BE_{Use,y}$	=	Baseline emissions from the production of power, heat or other forms of useful energy replaced by the project activity in year y (t CO ₂ e)

Methane destruction in the baseline - $BE_{MD,y}$

Via on-site investigation and checking the project design/^{FSR}/ and actual implementation/^{LOG}/, it is confirmed that the project contains only one source CMM, no CBM, VAM, AMM or OCM utilization is involved, and no methane is destructed in baseline scenario, thus

$$BE_{MD,y} = 0 \text{ tCO}_2\text{e}.$$

Methane venting in the baseline - $BE_{MR,y}$

According to the methodology,

$$BE_{MR,y} = \sum_i \sum_s (MT_{PJ,s,i,y} - MT_{BL,s,i,y}) \times GWP_{CH_4}$$

Where:

$MT_{PJ,s,i,y}$	=	Methane from source s captured and destroyed by use i in the project activity in year y (t CH ₄)
$MT_{BL,s,i,y}$	=	Methane from source s that would have been captured and destroyed by use i in the baseline scenario in the year y (t CH ₄)
i	=	Use of methane (flaring, power generation, etc.)
s	=	Source of methane that would have been captured, sent to and destroyed by use i in the baseline scenario in the year y. This may include eligible CBM, CMM, VAM, eligible AMM and eligible OCM
GWP_{CH_4}	=	Global warming potential of methane (tCO ₂ e/tCH ₄)

Via on-site investigation against checking the Joint-PD-MR, it is confirmed that for this project, no CMM is captured and destructed under the baseline scenario. Hence, $MT_{BL,s,i,y}$ is 0 and actual value of $MT_{PJ,s,i,y}$ will be monitored.

Above Equation is simplified as follows:

$$BE_{MR,y} = \sum_i \sum_s MT_{PJ,s,i,y} \times GWP_{CH4}$$

Baseline emissions from the production of power, heat or vehicle fuels - $BE_{Use,y}$

According to the methodology,

$$BE_{Use,y} = \sum_k (EG_{use,k,y} \times EF_{k,y})$$

Where:

$BE_{Use,y}$	=	Baseline emissions from energy displaced by the project activity in year y (tCO ₂)
$EG_{use,k,y}$	=	Energy of type k displaced by the project activity in year y (energy unit)
$EF_{k,y}$	=	Baseline emissions factor for energy type k production in year y (tCO ₂ / energy unit)
k	=	Energy type displaced by the project activity

Via on-site investigation and checking the project design/^{FSR/} and actual implementation/^{LOG/}, it is confirmed that for this project, no heat generation or vehicle fuel supply is involved, thus only the Baseline emissions from the production of power is considered.

According to the methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)/^{TBPL/},

$EG_{use,k,y} = EG_{PJ,grid,y}$, and

$EF_{k,y} = EF_{grid,CM,y}$, thus

$$BE_{Use,y} = EG_{PJ,grid,y} \times EF_{grid,CM,y}$$

where:

$EG_{PJ,grid,y}$	=	Net amount of electricity generated using methane in year y (MWh/yr)
$EF_{grid,CM,y}$	=	Combined margin CO ₂ emission factor for the project electricity system CSPG in year y (tCO ₂ e/MWh)

$EG_{PJ,grid,y}$ is ex-ante determined from the FSR, and will be monitored during the verification process.

Calculation of $EG_{grid,CM,y}$

As per the applied methodology (ACM0008 ver. 08.0) and “Tool to calculate the emission factor for an electricity system” (version 07.0)/^{TEF/},

The $EF_{grid,CM,y}$ calculation refers to the latest version of “2019 Baseline Emission Factors for Regional Power Grids in China” published by China’s DNA on 29-December-2020^{1/BEF/}. The Joint-PD-MR was submitted for

¹ “2019 Baseline Emission Factors for Regional Power Grids in China” published by China’s DNA on 29-December-2020. Refer to the website <https://www.mee.gov.cn/ywgz/ydqhbh/wsgtkz/202012/W020201229610353816665.pdf>

VCS GSC on 23-March-2022, $EF_{grid,CM,y}$ of year 2019 is the latest valid available data at the time of the validation which is verified by VVB by checking the DNA website and based on the local expertise.

Baseline emission factor $EF_{grid,CM,y}$ is determined by follow sub-steps according to the “Tool to calculate the emission factor for an electricity system” (version 07.0).

Sub-Step 1. - Identify the relevant electricity systems.

China Southern Power Grid (CSPG), which the project directly connected, is selected as the electric power system of the Project.

According to the Chinese DNA guidance, CSPG is composed of Guangdong, Guangxi, Yunnan, Guizhou and Hainan Provincial Power Grids.

Besides, there is net electricity imported from the Central China Power grid (CCPG) and East China Power Grid (ECPG) to the South China Power grid. Therefore, Central China Power grid (CCPG) and East China Power Grid (ECPG) are chosen as the connected electric power system.

The validation team verified the data sources of “2019 Baseline Emission Factors for Regional Power Grids in China” published by China’s DNA^{BEF/}, and confirms that the identified electric power system is appropriate.

Sub-Step 2. -Choose whether to include off-grid power plants in the project electricity system.

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

Sub-Step 3. -Select a method to determine the operating margin (OM).

For the calculation of the OM emission factor, the simple OM emission factor calculation method is selected because low cost/must-run projects constitute less than 50% of the total grid generation during the last 5 years (2013-2017). And the ex-ante option is selected for the calculation of the simple OM emission factor.

The validation team has checked the calculation for low cost/must-run constitution of the total grid generation and confirmed the calculation is correct. Therefore, simple OM emission factor calculation method is selected reasonable. Data from China Electric Power Yearbook 2014-2018 has been applied correctly^{BEF/&/CEPY/}.

Sub-Step 4. -Calculate the operating margin emission factor according to the selected method.

Since only on-grid power is included, and the necessary data for Option A is unavailable, option B (44 a)) “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” is selected for the calculation of the simple OM emission factor.

The data on electricity generation and auxiliary electricity consumption are obtained from the China Electric Power Yearbook from 2016 to 2018^{CEPY/}. The data on different fuel consumptions for power generation and the net caloric values of the fuels are obtained from the China Energy Statistical Yearbook from 2016 to 2018^{CESY/}. The emission factors of the fuels adopted are obtained from Table 1-2 and Table 1-4 of the “2006 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook.”^{/IPCC/}

The renewable crediting period is adopted for the Project and the OM will be fixed for the 10 years fixed crediting period as the ex-ante option is selected for the calculation of the simple OM emission factor.

The data sources are checked as reasonable and the validation team confirms that the calculation is able to be replicated using the data and parameter provided in the Joint-PD-MR.

Sub-Step 5.- Calculate the build margin (BM) emission factor.

Considering data availability, deviation accepted by EB was used in the Joint-PD-MR i.e.

- 1) Use of capacity additions during the last 1~3 years for estimating the build margin emission factor for grid electricity.
- 2) Use of weights estimated using installed capacity in place of annual electricity generation.

The BM emission factor of the power grid is calculated by multiplying the emission factor of the thermal power with the share of the thermal power in the most recently added approach to 20% of total installed capacity. The emission factor for thermal power is determined based on the most advanced and commercially available technology endorsed by China's DNA.

The validation team hereby confirms that the data source and approaches taken are deemed reliable and the calculation is appropriate.

Sub-Step 6.-Calculate the combined margin (CM) emissions factor.

According to the "Tool to calculate the emission factor for an electricity system" (version 07.0)^{TEF/}, the default weights: $\omega_{OM}=0.5$ for Operating Margin and $\omega_{BM}=0.5$ for Build Margin in the first crediting period of CMM projects are adopted for the project using fixed crediting period.

In accordance to the "Tool to calculate the emission factor for an electricity system" (version 07.0)^{TEF/}, the Simple OM emission factor ($EF_{grid,OM,y}$) of CSPG is calculated ex-ante as 0.8042 tCO₂e/MWh which is issued by China DNA/^{BEF/}. Similarly, the build margin emission factor ($EF_{grid,BM,y}$) of the CSPG is calculated ex-ante as 0.2135 tCO₂e/MWh/^{BEF/}. Hence,

$$EF_{grid,CM,y} = 0.8042 \text{ tCO}_2\text{e/MWh} \times 0.5 + 0.2135 \text{ tCO}_2\text{e/MWh} \times 0.5 \\ = 0.5088 \text{ tCO}_2\text{e/MWh}$$

Therefore the combined baseline emission factor is determined ex-ante and will remain fixed during the fixed 10 years crediting period.

Project emissions:

Project emissions comprise the following sources:

- (a) Emissions from the energy use to capture and use methane;
- (b) Emissions from destruction of captured methane through production of various energy types and/or flaring and/or flameless oxidation;
- (c) Emissions from the un-combusted methane.

$$\text{Hence, } PE_y = PE_{ME,y} + PE_{MD,y} + PE_{UM,y}$$

Where:

- PE_y = Project emissions in year y (tCO₂e)
 $PE_{ME,y}$ = Project emissions from energy use to capture and use methane (tCO₂e)
 $PE_{MD,y}$ = Project emissions from destruction of captured methane (tCO₂e)
 $PE_{UM,y}$ = Project emissions from un-combusted methane in year y (tCO₂e)

Project emissions from the energy use to capture and to use methane - $PE_{ME,y}$

For the project, according to the methodology, emissions due to electricity consumption should be determined using the latest version of the “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)^{TBPL/},

$$PE_{ME,y} = PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EF,j,y} \times (1 + TDL_{j,y})$$

Where:

- $PE_{EC,y}$ = Project emissions from electricity consumption in year y (t CO₂/yr)
 $EC_{PJ,j,y}$ = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
 $EF_{EF,j,y}$ = Emission factor for electricity generation for source j in year y (t CO₂/MWh)
 $TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y

$EC_{PJ,j,y}$ is the electricity used for emergency in case the project is not generated power for itself, it is ex-ante determined as 0 and actual value will be monitored.

According to the tool, the PP choose $EF_{EF,j,y} = EF_{grid,CM,y}$. while $EF_{grid,CM,y}$ is equal to the CSPG emission factor which is stated in the above BE calculation section. According to the Tool, the project belongs to the scenario A, the Electricity consumption from the grid. Thus, $TDL_{j,y}$ is determined as 3% which is the default value for project or leakage electricity consumption sources.

Thus $PE_{ME,y}$ is ex-ante determined as 0.

Project emissions from destruction of captured methane - $PE_{MD,y}$

According to the methodology,

$$PE_{MD,y} = \sum_i MD_{i,y} \times CEF_{CH_4}$$

Where:

- $MD_{i,y}$ = Methane destroyed through use i (t CH₄), i is only electricity, hence $MD_{i,y} = MD_{ELEC,y}$
- i = Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses), for this project i is only electricity
- CEF_{CH4} = Carbon emission factor for combusted methane. Set as 2.75 (t CO₂/t CH₄)

In each end-use, the amount of methane destroyed depends on the efficiency of combustion of each end use and should be determined as follows.

$$MD_{i,y} = MM_{i,y} \times Eff_{i,y}$$

Where:

- $MD_{i,y}$ = Methane destroyed through use i in year y (t CH₄), (i is only electricity, thus $MD_{i,y}$ is $MD_{ELEC,y}$)
- $MM_{i,y}$ = Methane measured sent to use i in year y (t CH₄), (i is only electricity, thus $MM_{i,y}$ is $MM_{ELEC,y}$)
- $Eff_{i,y}$ = Efficiency of methane destruction in use i in year y (%), i is only electricity, thus $Eff_{i,y}$ is $Eff_{ELEC,y}$)

$$\text{Therefore, } PE_{MD,y} = MD_{ELEC,y} \times CEF_{CH4} = MM_{ELEC,y} \times Eff_{ELEC,y} \times CEF_{CH4}$$

Via on-site investigation and checking the project design/^{FSR}, it is confirmed that no heat generation or gas supply is involved in the project, thus the only use of methane is for power generation. $MM_{i,y}$ (i is only electricity, thus $MM_{i,y}$ is $MM_{ELEC,y}$) is ex-ante derived from the FSR, and actual value will be monitored. According to the methodology, for power and heat generation, the efficiency $Eff_{i,y}$ (i is only electricity, thus $Eff_{i,y}$ is $Eff_{ELEC,y}$) should be derived from the latest IPCC Report.

Project emissions from un-combusted methane - $PE_{UM,y}$

According to the methodology,

$$PE_{UM,y} = GWP_{CH4} \times \sum_i MM_{i,y} \times (1 - Eff_{i,y})$$

Where:

- GWP_{CH4} = Global warming potential of methane (t CO₂e/t CH₄)
- i = Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses)
- $MM_{i,y}$ = Methane measured sent to use i in year y (t CH₄), i is only for electricity, so $MM_{i,y} = MM_{ELEC,y}$
- $Eff_{i,y}$ = Efficiency of methane destruction in use i in year y (%), i is only for electricity, so $Eff_{i,y} = Eff_{ELEC,y}$

$$\text{Therefore, } PE_{UM,y} = GWP_{CH4} \times MM_{ELEC,y} \times (1 - Eff_{ELEC,y})$$

Via on-site investigation and checking the project design/^{FSR}, it is confirmed that no heat generation or gas supply is involved in the project, thus the only use of methane is for power generation. $MM_{i,y}$ (i is only

electricity, thus $MM_{i,y}$ is $MM_{ELEC,y}$) is ex-ante derived from the FSR, and actual value will be monitored. According to the methodology, for power and heat generation, the efficiency $Eff_{i,y}$ (i is only electricity, thus $Eff_{i,y}$ is $Eff_{ELEC,y}$) should be derived from the latest IPCC Report. GWP_{CH4} is updated to 28 tCO_2e/CH_4 based on VCS standard version 4.3.

Leakage

According to the methodology, Leakage may occur if the project activity prevents methane from being used to meet baseline thermal energy demand, whether as a result of physical constraints on delivery, or price changes.

Via the Joint-PD-MR and site inspection, and checking the baseline scenario evidence/*CER/SEP/*, it is confirmed that baseline scenario of the project does not include thermal energy use. Thus, there is no leakage occurred due to displacement of baseline thermal energy demand. Hence, for the project activity,

$$LE_y = 0 \text{ tCO}_2e$$

Emission reductions:

$$\begin{aligned} ER_y &= BE_y - PE_y - LE_y \\ &= BE_y - PE_y \\ &= (BE_{MR,y} + BE_{Use,y}) - (PE_{MD,y} + PE_{UM,y}) \\ &= (MT_{PJ,s,i,y} \times GWP_{CH4} + EF_{grid,CM,y} \times EG_{PJ,grid,y}) - (ME_{ELEC,y} \times CEF_{CH4} + GWP_{CH4} \times MM_{ELEC,y} \times (1 - Eff_{ELEC,y})) \\ &= (MT_{PJ,s,i,y} \times GWP_{CH4} + EF_{grid,CM,y} \times EG_{PJ,grid,y}) - (MM_{ELEC,y} \times Eff_{ELEC,y} \times CEF_{CH4} + GWP_{CH4} \times MM_{ELEC,y} \times (1 - Eff_{ELEC,y})) \end{aligned}$$

For the ex ante calculation of ER_y , the estimated annual CMM measured sent to power plant is derived from FSR/*FSR/*, it is confirmed that quantity is 8.7936 million m^3 CMM, by considering the density of methane is $0.67 \text{ kg}/m^3$, the methane measured sent to power plant annually is $8.7936 \times 10^6 m^3 \times 0.67 \text{ kg}/m^3 / 1000 \text{ kg}/t = 5,892 \text{ tCH}_4$

$$\begin{aligned} ER_y &= (5,892 \text{ tCH}_4 \times 28 \text{ tCO}_2e/\text{tCH}_4 + 0.5088 \text{ tCO}_2e/\text{MWh} \times 24,816 \text{ MWh}) - (5,892 \text{ tCH}_4 \times 99.5\% \times 2.75 \text{ tCO}_2/\text{tCH}_4 + 28 \text{ tCO}_2/\text{tCH}_4 \times 5,892 \text{ tCH}_4 \times (1 - 99.5\%)) \\ &= (164,976 \text{ tCO}_2e + 12,626 \text{ tCO}_2e) - (16,122 \text{ tCO}_2e + 825 \text{ tCO}_2e) \\ &= 177,602 \text{ tCO}_2e/\text{yr} - 16,947 \text{ tCO}_2e/\text{yr} \\ &= 160,655 \text{ tCO}_2e/\text{yr} \end{aligned}$$

The estimated amount of GHG emission reductions of the project is **1,606,550 tCO₂e** during the fixed crediting period (10 years) from 01-October-2020 to 30-September-2030, resulting in estimated average annual emission reductions of **160,655 tCO₂e**.

The XLS ER calculation/*XLS/* has been duly checked. Further it has been checked whether the results have been correctly calculated in Joint-PD-MR for determination of ex-ante ER. The validation team has further checked the Joint-PD-MR against the latest version of the applicable methodology incl. the referenced methodological tools for consistency.

3.4.7 Methodology Deviations

There are no any methodology deviations applied to the project.

3.4.8 Monitoring Plan

1. Data and parameters available at validation

Please refer to the following tables for assessment of each parameter determined ex-ante:

MT_{BL,s,i,y}	Methane from sources that would have been captured and destroyed by use i in the baseline scenario in the year y
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is FSR
Correct value provided?	Yes – 0 tCH ₄
Has this value been verified?	Yes. There is no methane captured and destroyed in the baseline scenario
Choice of data correctly justified?	Yes
Measurement method correctly described?	N/A

CEF_{CH4}	Carbon emission factor for combusted methane
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is ACM0008 (Version 08.0) which is appropriate
Correct value provided?	Yes – 2.75 tCO ₂ e/ tCH ₄
Has this value been verified?	Yes. It is a default value. The value has been verified against the applied methodology
Choice of data correctly justified?	Yes
Measurement method correctly described?	N/A

D_{CH4}	Density of methane under normal conditions of temperature and pressure
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Correct value provided?	Yes – 0.67 kg/m ³
Has this value been verified?	Yes. This parameter is used to calculate the methane from source s captured and destroyed by the project activity in mass unit. For MT _{PJ,s,i,y} (MM _{ELEC,y}) is monitored by Flow meter in volume unit, which will be converted to mass unit with the parameter of D _{CH4} .
Choice of data correctly justified?	Yes
Measurement method correctly described?	N/A

EF_{k,y}, EF_{EF,j,y} (EF_{grid,CM,y})	Combined margin emission factor for the grid in year y (CSPG)
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	“2019 Baseline Emission Factors for Regional Power Grids in China” published by DNA of China/ ^{BEF} /
Correct value provided?	0.5088 tCO _{2e} /MWh
Has this value been verified?	Yes. The value has been verified against “2019 Baseline Emission Factors for Regional Power Grids in China” published by DNA of China/ ^{BEF} /
Choice of data correctly justified?	Yes
Measurement method correctly described?	Calculated as per the latest version of “Tool to calculate the emission factor for an electricity system” (version 07.0)/ ^{TEF} / by DNA of China, the ex-ante option is selected.

TDL_{j,y}	Average technical transmission and distribution losses for providing electricity to source j in year y
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Ver 03.0)/ ^{TBPL} /
Correct value provided?	3%
Has this value been verified?	Yes. According to the tool, the project belongs to scenario A, thus the option 3 was chosen by PP: “Use as default values of 3% for project and leakage electricity consumption sources due to the electricity consumption by all project and leakage electricity consumption sources is smaller than the electricity consumption of all baseline electricity consumption sources.” By checking the FSR/ ^{FSR} /, it is confirmed that the electricity consumption by project is 0 in ex-ante phase and will be monitored in verification process, which is smaller than the electricity consumption in baseline of the project (24,816MWh/yr as confirmed in FSR). Hence, 3% is applicable to the project
Choice of data correctly justified?	Yes
Measurement method correctly described?	From the tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Ver 03.0)/ ^{TBPL} /

2. Data and Parameters Monitored

The monitoring parameters required by the methodology and applicable tools for the project are summarized in the below table.

MT_{Pj,s,i,y}	Methane from source s captured and destroyed by use i in the project activity in year y
------------------------------	--

Title in line with Methodology?	Yes
Ex-ante Value	5,892 t CH ₄
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The ex ante source is FSR/FSR/
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified against the FSR/FSR/
Choice of data correctly justified?	Yes
Measurement method correctly described?	Measured using a flow meter with pressure sensor and temperature sensor measure the gas flow, temperature and pressure simultaneously and a gas analyzer and is calculated by the gas flow rate, pressure, temperature and CH ₄ concentration of CMM. Flow meter will record gas volumes, pressure and temperature. Density of methane under normal conditions of temperature and pressure (defined as 1 atm, 293.15K) is 0.67kg/m ³ (2006 IPCC Guidelines for National Greenhouse Gas Inventories)
Monitoring frequency correctly described?	Continuously measurement and monthly recording verified as per the applied methodology
QA/QC procedure correctly described?	Yes Flow meter and gas analyzer will be periodically checked and calibrated
Purpose of data?	BE _y calculation

MM_{ELEC,y}	Methane measured sent to use of power generation in year y
Title in line with Methodology?	Yes
Ex-ante Value	5,892 t CH ₄
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The ex ante source is FSR/FSR/
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified against the FSR/FSR/
Choice of data correctly justified?	Yes
Measurement method correctly described?	Measured using a flow meter with pressure sensor and temperature sensor measure the gas flow, temperature and pressure simultaneously and a gas analyzer and is calculated by the gas flow rate, pressure, temperature and CH ₄ concentration of CMM. Flow meter will record gas volumes, pressure and temperature. Density of methane under normal conditions of temperature and pressure (defined as 1 atm, 293.15K) is 0.67kg/m ³ (2006 IPCC Guidelines for National Greenhouse Gas Inventories)
Monitoring frequency correctly described?	Continuously measurement verified as per the applied methodology
QA/QC procedure correctly described?	Yes Flow meter and gas analyzer will be periodically checked and calibrated
Purpose of data?	PE _y calculation

GWP_{CH4}	Global warming potential of methane
Title in line with Methodology?	Yes
Ex-ante Value	28 tCO ₂ e/ tCH ₄
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	IPCC Fifth Assessment Report (AR5) ^{/AR5/}
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified against the IPCC Fifth Assessment Report (AR5) ^{/AR5/} and this value is requested by VERRA in VCS Standard Version 4.3 ^{/VCS/} .
Choice of data correctly justified?	Yes
Measurement method correctly described?	IPCC Fifth Assessment Report (AR5) ^{/AR5/}
Monitoring frequency correctly described?	Will be updated according to the relevant documents
QA/QC procedure correctly described?	N/A for default value
Purpose of data?	BE _y and PE _y calculation

EG_{use,k,y} (EG_{PJ,grid,y})	Energy of type k displaced by the project activity in year y
Title in line with Methodology?	Yes
Ex-ante Value	24,816 MWh
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The ex ante source is FSR ^{/FSR/}
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified against the FSR ^{/FSR/}
Choice of data correctly justified?	Yes
Measurement method correctly described?	Measured by electricity meters and monthly recorded.
Monitoring frequency correctly described?	Continuously measurement verified as per the applied methodology
QA/QC procedure correctly described?	Yes Calibration will be carried out annually to ensure normal operation. The data will be cross checked with Electricity Transaction Notes.
Purpose of data?	BE _y calculation

EC_{PJ,j,y}	Quantity of electricity consumed by the project electricity consumption source j in year y
Title in line with Methodology?	Yes
Ex-ante Value	0 MWh
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The ex ante source is FSR ^{/FSR/}
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified against the FSR ^{/FSR/}

Choice of data correctly justified?	Yes
Measurement method correctly described?	Measured by electricity meters and monthly recorded.
Monitoring frequency correctly described?	Continuously measurement verified as per the applied methodology
QA/QC procedure correctly described?	Yes Calibration will be carried out annually to ensure normal operation. The data will be cross checked with Electricity Transaction Notes.
Purpose of data?	PE _y calculation

Eff _{i,y} (Eff _{ELEC,y})	Efficiency of methane destruction in use i (for the project, i represents power generation)
Title in line with Methodology?	Yes
Ex-ante Value	99.5%
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	For power and heat generation efficiency should be derived from the latest IPCC Report/ ^{IPCC/}
Correct value provided?	Yes
Has this value been verified?	Yes. The value has been verified as derived from the latest IPCC Report/ ^{IPCC/}
Choice of data correctly justified?	Yes
Measurement method correctly described?	From the latest IPCC Report / ^{IPCC/}
Monitoring frequency correctly described?	Annually checking the latest IPCC data
QA/QC procedure correctly described?	N/A
Purpose of data?	PE calculation

3. Monitoring plan

The validation team has checked the monitoring plan of the Joint-PD-MR against the applied methodology and methodological tools.

The monitoring plan in the Joint-PD-MR has been designed to comply with the latest applicable version of the monitoring methodology (ACM0008 version 08.0) and “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)/^{TBPL/}.

Monitoring system

Data and parameters to be monitored as above tables are confirmed in line with the methodology and tool, also corresponding to the formula used for ER calculation.

For the monitoring system and points, via on-site investigation, it is confirmed that the methane monitoring system is installed between the pre-treatment system and gas engine, four parameters (concentration, measure flow, pressures and temperature) are measured on-time by the system. The electricity generated is supplied to coal mine under the Gas Cooperative Development and Utilization Agreement/^{GCA/} and surplus supplied to grid under the Power Purchase Agreement/^{PPA/}. And the bidirectional electricity meters has been installed between the generator and coal mine to measure electricity exported and consumed.

All meters will be calibrated by qualified third parties in line with the national calibration standard.

Operational and management structure:

The Joint-PD-MR contains a diagram illustrating the Management structure of VCS monitoring to be implemented by the PP in order to implement the project activity. The VCS manager will take the responsibility for the overall monitoring of the project, and there will be monitoring officers for installation and maintenance of monitoring equipment, record and collect monitoring results and monitoring data. Besides, internal verifiers appointed by VCS manager will be responsible for internal check of the measurement, collection of relevant sheets, and the calculation of the emission reductions. The organizational structure is considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified.

Data collection procedure

The Joint-PD-MR contains a description of data collection procedure which has been confirmed as actual and reasonable via site inspection. The monitoring officers collect the measured methane and electricity data regularly and complete the corresponding records. And all the monitored data has been recorded and collected properly by computer system and monitoring officers. All the cross-check evidence such as electricity transaction notes have been collected for checking the data and archived properly.

QA/QC procedure

Authorities and responsibilities regarding monitoring plan have been described in section 5.3 of the Joint-PD-MR.

The accuracy of electricity meters should not be less than 0.5S and installed as per the requirements of DL/T448–2016 Technical Administrative Code of Electric Energy Metering^{DLT/}. The installation of flow meter for gas drainage and gas analyzer will fulfill the national standard JJG 1138-2017 and JJG 640-2016^{SFG/}. Calibration of metering equipment should be implemented periodically by qualified party according to national standards and rules. All the records should be documented by the project owner.

Emergency Procedure

Project participant and meter supplier will take actions to maintain or will replace the broken meter(s) if any malfunction, and the monitoring data will be calculated conservatively for emission calculations during the meter troubleshooting period.

For this monitoring period, via checking the continuous electricity data/MRR/ and gas data/GMD/, it is verified that there was no emergency occurred.

Data management

All data files, relevant electricity transaction notes will be collected by a designated monitoring officer, who will prepare backup in time and archive all documents properly.

All the relevant data records will be kept by the Project owner during the crediting period and two years after for VVB's verification.

In detail all parameters, ex-ante values and applicable formulae have been checked to determine the required changes for the next crediting period.

Besides, based on conducted interviews with related personnel the validation team has assessed the feasibility of the required changes.

Based on interview with site personnel and validation team's local and sectoral knowledge, the measurement methods, recording procedures, meter maintenance and QA/QC procedures described in the monitoring plan are feasible in China and can fully meet the requirements of the methodology. No difficulties are anticipated in implementing the operational and management structure nor the monitoring plan as a whole.

CL 04 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.5 Non-Permanence Risk Analysis

N/A

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

By means of on-site inspection and documents review, the verification team can ensure that during this monitoring period, in accordance with the Joint-PD-MR and FSR, CMM power generators with the total installed capacity of 4.8 MW are planned to be installed to utilize CMM for power generation.

This verification covers the period from 01-October-2020 to 31-December-2021 (including both days). 126,134 tCO₂e emission reductions are achieved during this monitoring period.

The main timeline of the project is as below table, which has been confirmed in the record of started construction and operation/^{RSCO/}, daily operational log/^{LOG/} against the record of started construction and operation/^{RSCO/}.

Table 4-1 Milestone of plant

Milestone	Commissioning Date
Start date of construction	20-August-2019/ ^{RSCO/}
Start date of commissioning of 4.2 MW	01-October-2020/ ^{RSCO/}
Start date of the crediting period	01-October-2020

The project supplies electricity to the coal mine for captive use/^{GCA/} and surplus to grid/^{PPA/}, replacing the equivalent amount of electricity that would have been purchased from or generated in the CSPG and the captive power plants. Waste heat from the generators have been recovered to provide heat to the coal mine. Emission reductions due to heat replacement are not claimed, it is confirmed as conservative.

Via on-site investigation, it is confirmed that during this monitoring period, not all the CMM generators have been operated to generate the electricity due to a lower level of CMM availability than initially expected which has been confirmed by site interview with the operation staffs and checking the Gas Monthly Data/^{GMD/}. Via checking the operation log/^{LOG/}, it is confirmed that 7 generators were put into operation with installed capacity of 4.2 MW (7*0.6MW) which has been verified by checking the Statement about the CMM availability of Jinyan CMM power plant provided by the project proponents/^{SCA/}.

And via site inspection and checking the operation log/^{LOG/}, it is confirmed that there were no events for the normal operation of the 7 generators at CMM power plant occurred.

On the basis of site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated as applied monitoring methodology and monitoring plan described in the Joint-PD-MR.

By means of comparison of the Joint-PD-MR with the applied CDM methodology and all applicable CDM Meth tools, the verification team has checked whether the monitoring implementation during this monitoring period is in compliance with the monitoring plan related requirements of the applied methodology/tools and Joint-PD-MR.

Methane sent to the power generators $MT_{PJ,s,i,y}$ and $MM_{ELEC,y}$ and Concentration are measured continuously by the Flow meter for gas drainage simultaneously measure the CMM flow, temperature and pressure and gas analyser. Flow meter and gas analyser are installed at this CMM power plant. $MT_{PJ,s,i,y}$ and $MM_{ELEC,y}$ is continuously measured and hourly recorded by DCS system automatically. The Flow meter and gas analyzer monitors the Methane sent to the power generators. And the calculation is done by the DCS system automatically. Electricity generation by the project $EG_{use,k,y}$ and electricity consumption for the project activity $EC_{PJ,i,y}$ is continuously monitored by electricity meters installed at CMM power plant.

During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the Joint-PD-MR and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6).

Furthermore, via site inspection and checking the calibration records/^{CAL}/, it is verified that there is no emergency procedures and no change of the devices&meter occurred during this monitoring period.

Hence, based on above assessment, it is confirmed that there were no any material discrepancies between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology.

The project has neither been registered nor seeking registration under any other GHG programs since validation which has been confirmed via checking the UNFCCC/^{unfccc}/, GS/^{gs}/, VCS/^{vcs}/ and other GHG schemes' website. It is verified that the project is seeking registration only in VCS program/^{vcs}/.

The project has neither been rejected by any other GHG programs since validation which has been confirmed via checking the UNFCCC/^{unfccc}/, GS/^{gs}/, VCS/^{vcs}/ and other GHG schemes' website.

Via interview with the project owner/¹¹/ and based on above assessment, it is confirmed that the project has not created any other form of environmental credit since validation.

Via on-site interview with the project implementer and on-site inspection, it is verified that the implementation of the project is consistent with the description in the Joint-PD-MR and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 01-October-2020 to 31-December-2021 and no any GHG emission reductions or removals generated by the project for this monitoring period have become included in an emissions trading program or any other mechanism that includes GHG allowance trading.

The project has implemented the activities that result in the SD contributions which has been elaborated in the section 3.1 of this report related to the achievements for this monitoring period. Basic technical details of the project are summarized in table 4-2 which has been verified during site visit /^{PHT}/.

Table 4-2: Technical data of the project activity

Parameter	Unit	Value
CMM generators		
Type:	-	600GFZ-1RW
Quantity	-	8
Rated Power	kW	600
Rated Current	A	1,080
Rated voltage	V	400
Rated speed	r/min	1,000
Frequency	Hz	50

Parameter	Unit	Value
Power factor	-	0.8
Lifetime	year	10
Manufacturer	-	Shandong Dongying Power Machinery Co., Ltd

There are no any methodology deviations relevant.

In conclusion, the verification Team was able to confirm that the project implementation is in accordance with the project description contained in the Joint-PD-MR.

CL 05 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

1. Assessment of Data and parameters available at validation

Via checking the MR, it is confirmed that all the ex-ante data and parameters are same to the Joint-PD-MR which is verified as correct. Refer to section 3.4.8 for the detail assessment of ex ante parameters.

2. Assessment of Data and parameters monitored

During the verification all relevant monitoring parameters (as listed in chapter 3.4.8 of the report) have been verified with regard to the

- (i) appropriateness of the applied measurement / determination method,
- (ii) the correctness of the values applied for ER calculation,
- (iii) the accuracy, and applied QA/QC measures.

The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).

CL 06 and CAR 07 were raised and successfully closed. Refer to Appendix 4 for detail assessment.

3. Assessment of GHG emission reductions Quantity

During the verification the calculation of GHG emission reductions has been checked. In detail the following has been verified:

- *Transparency*: It has been checked whether the calculation of emission reductions is fully traceable and, where used, the Excel calculation provides all calculation formulae.
- *Parameter consistency*: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.
- *Correctness*: It has been checked whether the applied formulae and methods for calculating emission reductions are in accordance with the monitoring plan and the approved methodology.
- *Completeness*: It has been checked whether all calculations are complete and without omissions.

Baseline Emissions Calculation Assessment:

The formula used for the determination of baseline emissions is consistent with the latest approved Joint-PD-MR and methodology ACM0008 (version 08.0):

a. $BE_{MD,y}$

Via checking the Joint-PD-MR, it is confirmed that the baseline scenario does not involve any methane destruction, therefore, there is no methane destruction in the baseline. So, destruction of methane in the baseline scenario is 0.

b. $BE_{MR,y}$

According to the Joint-PD-MR and methodology,

$$BE_{MR,y} = \sum_i \sum_s (MT_{PJ,s,i,y} - MT_{BL,s,i,y}) \times GWP_{CH_4}$$

According to the Joint-PD-MR, it is confirmed that in the baseline scenario, no CMM is captured and destructed in the baseline scenario. Hence, $MT_{BL,s,i,y}$ is 0.

For this monitoring period:

$$\begin{aligned} BE_{MR,y} &= MT_{PJ,s,i,y} \times GWP_{CH_4} \\ &= 4,654.77 \text{ tCH}_4 \times 28 \text{ tCO}_2\text{e/tCH}_4 \\ &= 130,332 \text{ tCO}_2\text{e} \end{aligned}$$

c. $BE_{Use,y}$

According to the Joint-PD-MR and methodology,

For this monitoring period:

$$\begin{aligned} BE_{Use,y} &= EG_{PJ,grid,y} \times EF_{ELEC,y} \\ BE_{Use,y} &= EG_{Use,k,y} \times EF_{grid,CM,y} \\ &= EG_{PJ,grid,y} \times EF_{grid,CM,y} \\ &= 18,071.580 \text{ MWh} \times 0.5088 \text{ tCO}_2\text{/MWh} \\ &= 9,193 \text{ tCO}_2\text{e} \end{aligned}$$

Hence, for this monitoring period, the baseline emission result is listed as below table,

Time	$BE_{MD,y}$ tCO ₂ e	$BE_{MR,y}$ tCO ₂ e	$BE_{Use,y}$ tCO ₂ e	BE_y tCO ₂ e
01-October-2020 to 31-December-2020	0	21,885	1,626	23,511
01-January-2021 to 31-December-2021	0	108,447	7,567	116,014
Total (01-October-2020 to 31-December-2021)	0	130,332	9,193	139,525

Project Emission Calculation Assessment:

The formula used for the determination of project emissions is consistent with the latest approved Joint-PD-MR and methodology:

a. $PE_{ME,y}$

According to the Joint-PD-MR, for this monitoring period,

$$\begin{aligned} PE_{ME,y} &= PE_{EC,y} \\ &= EC_{PJ,j,y} \times EF_{EF,j,y} \times (1 + TDL_{j,y}) \\ &= 1.8 \text{ MWh} \times 0.5088 \text{ tCO}_2\text{e/MWh} \times (1 + 3\%) \\ &= 1 \text{ tCO}_2\text{e} \end{aligned}$$

b. $PE_{MD,y}$

According to the Joint-PD-MR and methodology, for this monitoring period,

$$\begin{aligned} PE_{MD,y} &= MM_{ELEC,y} \times Eff_{ELEC,y} \times CEF_{CH_4} \\ &= 4,654.77 \text{ tCH}_4 \times 99.5\% \times 2.75 \text{ tCO}_2\text{/tCH}_4 \\ &= 12,737 \text{ tCO}_2\text{e} \end{aligned}$$

c. $PE_{UM,y}$

According to the Joint-PD-MR and on-site interview with the operation staff/^{11/}, it is confirmed that not all the methane used for power generation is combusted, a small percentage escaped to the atmosphere. Hence,

According to the methodology and Joint-PD-MR, for this monitoring period,

$$\begin{aligned} PE_{UM,y} &= GWP_{CH_4} \times MM_{ELEC,y} \times (1 - Eff_{ELEC,y}) \\ &= 28 \text{ tCO}_2\text{e/tCH}_4 \times 4,654.77 \text{ tCH}_4 \times (1 - 99.5\%) \\ &= 653 \text{ tCO}_2\text{e} \end{aligned}$$

Hence, for this monitoring period, the project emission results for each plant and total are listed as below table,

Time	$PE_{EC,y}$ tCO ₂ e	$PE_{MD,y}$ tCO ₂ e	$PE_{UM,y}$ tCO ₂ e	PE_y tCO ₂ e
01-October-2020 to 31-December-2020	1	2,139	110	2,250
01-January-2021 to 31-December-2021	0	10,598	543	11,141
Total (01-October-2020 to 31-December-2021)	1	12,737	653	13,391

Leakage Emission Calculation Assessment:

As per the methodology and Joint-PD-MR, and on-site inspection, it is verified that there is no thermal energy use involved in the project, hence leakage (LE_y) during this monitoring period is 0.

$$LE_y = 0 \text{ t CO}_2\text{e}$$

Emission Reduction Calculation Assessment:

Summary of emission reductions during the monitoring period:

$$ER_y = BE_y - PE_y - LE_y$$

$$= BE_y - PE_y$$

$$= 126,134 \text{ tCO}_2\text{e}$$

Where:

- ER_y -Emission reductions (t CO₂e)
 BE_y -Baseline Emissions (t CO₂e)
 PE_y -Project Emissions (t CO₂e)
 LE_y -Leakage Emissions (t CO₂e)

During this monitoring period, the emission reduction is calculated as below table

Parameter Period	Baseline Emissions	Project Emissions	Leakage Emissions	Emission Reductions
	BE_y (tCO ₂ e)	PE_y (tCO ₂ e)	LE_y (tCO ₂ e)	ER_y (tCO ₂ e)
01-October-2020 to 31-December-2020	23,511	2,250	0	21,261
01-January-2021 to 31-December-2021	116,014	11,141	0	104,873
Total (01-October-2020 to 31-December-2021)	139,525	13,391	0	126,134

4. Assessment of GHG emission reductions Quantity Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimated values

The comparison of actual values of the monitoring period with the estimations has been carried out by VVB.

As per the ex-ante calculated results, VVB confirmed that the annual estimated emission reduction is 160,655 tCO₂e, thus the estimated emission reduction corresponding to this monitoring period (covering 457 days) is 201,148 tCO₂e, i.e. $201,148 \text{ tCO}_2\text{e} = 160,655 \text{ tCO}_2\text{e} \times 457 \text{ days} / 365 \text{ days}$. The actual emission reductions in this monitoring period are 126,134 tCO₂e, which is 37.29% less than the estimated values.

Via site inspection, it is confirmed that not all generators were in operation during this monitoring period and the project was not fully operated in this monitoring period with the designed installed capacity of 4.8MW.

Hence the estimated emission reductions for this monitoring period excluding non-operated generators have been calculated accordingly. By considering only 4.2 MW installed capacity were in operation during this monitoring period, the ex ante emission reduction is calculated as 176,005 tCO₂e ($201,148 \text{ tCO}_2\text{e} \times 4.2 \text{ MW} / 4.8 \text{ MW}$) during a 457-day period corresponding to this monitoring period.

Therefore, it is verified that the actual emission reductions achieved during this monitoring period is 28.34% ($126,134 \text{ tCO}_2\text{e} - 176,005 \text{ tCO}_2\text{e} / 176,005 \text{ tCO}_2\text{e}$) lower than the estimated emission

reductions (by considering only 4.2MW were in operation in the monitoring period and the project was not fully operated in this monitoring period with the designed installed capacity of 4.8MW) which is verified as reasonable by considering the fluctuation of project operation for this type and CMM availability was less than estimated during the initial operation of the project.

PP has listed the comparison result in the Joint-PD-MR/*JPM*/ and ER sheet/*XLS*/, and the related reason has been clarified in the Joint-PD-MR/*JPM*/ which is verified as correct and reasonable.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Refer to Appendix 5 for the detail assessment of each monitoring parameters and Appendix 3 for the supporting evidence used to determine the GHG emission reductions.

For each reported data, the evidence is provided and verified as sufficient and quality is appropriate. Also, the cross-checks has been performed on the reported data with different source of evidence. The information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report has been assessed by VVB in Appendix 5 for each parameter and also the calibration have been conducted as per the frequency of monitoring equipment defined in the Joint-PD-MR and national regulation.

Refer to Appendix 5 for the detail assessment.

Therefore, it is concluded that the evidence provided are verified as sufficient and quality is appropriate and thus the evidence can be used to determine the GHG reductions and removals for this monitoring period.

5 VALIDATION AND VERIFICATION CONCLUSION

Climate Bridge (Shanghai) Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) joint validation and 1st periodic verification of the project activity Guizhou Jinyan CMM Power Generation Project (VCS ID 2895), for the monitoring period from 01-October-2020 to 31-December-2021, with regard to the relevant requirements for VCS Standard Version 4.3.

Based on the documented evidence and by an on-site assessment, TÜV NORD can confirm that:

- the baseline scenario is correctly defined as per the applied methodology and relate tools;
- the project is additional;
- all data and information used for ex-ante calculation of emission reductions is of projected and/or hypothetical nature;
- the monitoring plan in the validated Joint-PD-MR is as per the applied baseline and monitoring methodology.
- the project has been implemented and operated as per the VCS Joint-PD-MR;
- the project complies with the validation and verification criteria for projects set out in VCS Standard Version 4.3;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS requirement and ACM0008 (version 08.0);
- the monitoring is in place as per the applied baseline and monitoring methodology ACM0008 (version 08.0);
- the monitoring complies with the monitoring plan in the validated Joint-PD-MR;

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-October-2020 to 31-December-2020	23,511	2,250	0	21,261
01-January-2021 to 31-December-2021	116,014	11,141	0	104,873
Total	139,525	13,391	0	126,134

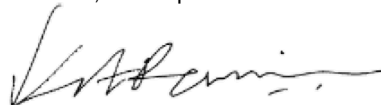
Beijing, 06-September-2022



Zhao Xuejiao

TÜV NORD JI/CDM Certification Program

Essen, 08-September-2022



Kunal Rami

TÜV NORD JI/CDM Certification Program

Verification Team Leader

Final Approval

APPENDIX 1: ABBREVIATIONS

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CBM	Coal Bed Methane
CCER	China Certified Emission Reduction
CCPG	Central China Power grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CMM	Coal mine Methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CSPG	China Southern Power Grid
DCS	Distributed Control System
DverR	Draft Verification Report
ECPG	East China Power Grid
EIA	Environmental Impact Assessment
EPC	Engineering Procurement Construction
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
JPM	Joint-PD-MR
MP	Monitoring Plan
MR	Monitoring Report
NMHC	Non Methane Hydrocarbons
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
PRC	Post Registration Change
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VAM	Ventilation Air Methane
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

APPENDIX 2: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/COM Certification Program

Ms. Xue Jiao Fancy Zhao

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2022-11-01
VCS / ISO 14064-2	Senior Assessor	2022-11-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
3.1	Energy Demand
8.1	Mining and mineral production
13.1	Solid waste and wastewater
13.2	Manure

230- Rev. 10, Date: 2020-06-29

230_501-VA060-F20_2020-06-29_rev11
501-VA060-F20 rev3 / 2012-10-25



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/COM Certification Program

Mr. Kunal Rami

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2023-03-26
VCS / ISO 14064.2	Senior Assessor Technical Reviewer	2023-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 - Rev. 9, Date: 2020-12-03

224_501-VA060-F20_2020-12-03_rev9
501-VA060-F20 rev3 / 2012-10-25



Statement of Competence

Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2025-07-01
JI	Senior Assessor	2025-07-01
VCS / ISO 14064-2	Senior Assessor	2025-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables
4.1	Cement and lime production
4.2	Paper
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
10.1	Fugitive emissions from oil and gas
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry
13.1	Solid waste and wastewater

003 - Rev. 12, Date: 2022-08-17

APPENDIX 3: DOCUMENTS REVIEWED OR REFERENCED

No	Author	Title	References to the document	Provider
1.	Dafang County Environment Protection Bureau	EIA approval/AEIA/	EIA approval of Guizhou Jinyan CMM Power Generation Project, dated 14-January-2019	Project Owner
2.	Development and Reform Commission of Dafang County	Project approval/AP/	Project approval for approve the FSR of the Guizhou Jinyan CMM Power Generation Project dated 27-August-2018	Project Owner
3.	Guizhou Province Administration for Industry and Commerce	Business License/BL/	Business License of Guizhou Jinyan Energy Technology Co., Ltd.	Project Owner
4.	Project Owner	Board meeting minute/BMM/	Board meeting minute of serious consideration to the VCS revenues to make the investment decision dated on 19-October-2018	Project Owner
5.	Guizhou Power Grid Co., Ltd. Electric Power Research Institute	Calibration certificates/CAL/	Calibration Certificates for Electricity meters covering this monitoring period	Project Owner
	Zunyi Institute of Products Quality Inspection and Testing		Calibration Certificates for gas analyzer covering this monitoring period	Project Owner
	Zunyi Institute of Products Quality Inspection and Testing		Calibration Certificates for Flow meter for methane including flow meter, pressure sensor, temperature sensor covering this monitoring period	Project Owner
6.	Project Owner and Dingbian Rongyue Construction Engineering Co., Ltd.	Construction Contract/CC/	Construction Contract for Guizhou Jinyan CMM Power Generation Project signed on 20-May-2019	Project Owner
7.	Project Owner	CMM extraction record/CER/	CMM extraction record for the Jinyan coal mine before the project started	Project Owner
8.	Zunyi City Quality and Technical Supervision Bureau	Certificate of Metrological Authorization /CMA/	Certificate of metrological authorization to Zunyi Institute of Products Quality Inspection and Testing valid from 06-June-2017 to 05-June-2023	Project Owner
	Guiyang City Quality and Technical Supervision Bureau		Certificate of metrological authorization to Guizhou Power Grid Co., Ltd. Electric Power Research Institute, valid from 17-May-2018 to 16-May-2024	

No	Author	Title	References to the document	Provider
9.	Jinyan coal mine	Coal production record/ ^{CPR} /	Coal production records for Jinyan coal mine for this monitoring period	Project Owner
10.	Beijing Gongda Zhiyuan Technology Development Co., Ltd.	Environmental Impact Assessment/ ^{EIA} /	EIA for Guizhou Jinyan CMM Power Generation Project issued in December 2018	Project Owner
11.	Guizhou Jinyan Energy Technology Co., Ltd. and Shandong Dongying Power Machinery Co., Ltd	Equipment purchase contract/ ^{EPC} /	Equipment purchase contract for 600kW*8 of Guizhou Jinyan CMM Power Generation Project dated 05-April-2019	Project Owner
12.	Project Owner and Jinyan coal mine	Electricity transaction note/ ^{ETN} /	Monthly Electricity transaction notes with Jinyan Coal mine covering the monitoring period	Project Owner
	Project Owner and Bijie Power Supply Bureau of Guizhou Power Grid Co., Ltd.		Monthly Electricity transaction notes with Grid company covering the monitoring period	
13.	China Coal Science and Industry Group Nanjing Design and Research Institute Co., Ltd..	Feasibility Study Report/ ^{FSR} /	Feasibility Study Report of Guizhou Jinyan CMM Power Generation Project dated in July 2018	Project Owner
14.	Project Owner and Jinyan coal mine	Gas Cooperative Development and Utilization Agreement/ ^{GCA} /	Gas Cooperative Development and Utilization Agreement for Guizhou Jinyan CMM Power Generation Project issued on 23-March-2019	Project Owner
15.	Project Owner	Gas Monthly Data/ ^{GMD} /	Gas Monthly Data covering this monitoring period - Monthly gas flow reports via flow meter, pressure sensor and temperature sensor - Monthly methane concentration readings via gas analyzer meter	Project Owner
16.	Climate Bridge (Shanghai) Ltd.	IRR calculation sheet/ ^{IRR} /	IRR calculation sheet of Guizhou Jinyan CMM Power Generation Project - Draft Version 01, dated 24-March-2022 - Final Version 02, dated 30-May-2022	Climate Bridge (Shanghai) Ltd.
17.	Climate Bridge (Shanghai) Ltd.	Joint-PD-MR/ ^{JPM} /	Joint-PD-MR of Guizhou Jinyan CMM Power Generation Project - Draft Version 01, dated 24-March-2022 - Version 03, dated 01-July-2022	Climate Bridge (Shanghai) Ltd.

No	Author	Title	References to the document	Provider
			Final Version 4.0, dated 06-September-2022	
18.	Project Owner and employments	Labor contract/LC/	Labor contracts signed between Project Owner and employments	Project Owner
19.	Project Owner	LOG/LOG/	- Sample copy of project operation records - Equipment daily check log - Equipment mandatory maintenance records	Project Owner
20.	Local stakeholders	Local stakeholder consultation records/LSC/	Local communication survey records before project started construction including all the filled questionnaires and photo of public announcements on bulletin boards	Project Owner
21.	Project Owner and local authority	Local communication survey records/LSCR-M/	Local communication survey records during this monitoring period including all the filled questionnaires	Project Owner
22.	Project Owner	Meter Reading Records/MRR/	Monthly Meter reading records of electricity meters covering this monitoring period	Project Owner
23.	Project Owner	Project Operation and Maintenance Records/O&M/	Project Operation and Maintenance Records and Regulations of this CMM power plant - Sample copy of O&M records - Gas Engine Generator Operation Safety Management Regulations - Routing inspection operation instruction - Routing inspection line diagram - Fire emergency plan	Project Owner
24.	Project Owner	Payroll/PAY/	Monthly Payroll to employments	Project Owner
25.	Project Owner and Bijie Power Supply Bureau of Guizhou Power Grid Co., Ltd.	Power Purchase Agreement/PPA/	Power Purchase Agreement for Guizhou Jinyan CMM Power Generation Project issued on 21-August-2020	Project Owner
26.	Project Owner	Gas and Power Wiring Diagram/PWD/	Gas and Power Wiring Diagrams of CMM power plant derived from DCS system of the CMM power plant	Project Owner
27.	Project Owner	QA/QC procedures/QA/	QA/QC procedures of implementation of the project, including the emergency response procedure	Project Owner
28.	Project Owner	Record of started construction and operation/RSCO/	Record of started construction and operation of Guizhou Jinyan CMM Power Generation Project	Project Owner
29.	Coal mine	Statements of electricity purchase/SEP/	Statements of electricity purchased from the grid by coal mine before project started	Project Owner

No	Author	Title	References to the document	Provider
30.	Project Owner	Training and Competence Records/TCR/	Project Responsibilities, Training and Competence Records - Project Organization Chart and responsibilities - Staff Training Records of this CMM power plant - Operator Certificates of this CMM power plant	Project Owner
31.	Climate Bridge (Shanghai) Ltd.	Emission Reduction Calculation Sheets/XLS/	Emission Reduction Calculation sheets related to Joint-PD-MR for both ex ante and ex post for this monitoring period - Draft Version 01, dated 24-March-2022 - Version 1.1, dated 30-May-2022 - Final Version 3.0, dated 06-September-2022	Climate Bridge (Shanghai) Ltd.
32.	UNFCCC	Applied methodology/ACM 0008/	Approved CDM methodology ACM0008: "Abatement of methane from coal mine" (version 08.0)	UNFCCC Website
33.	IPCC	AR5/AR5/	IPCC Fifth Assessment Report (AR5)	IPCC website
34.	China DNA	Baseline Emission Factors/BEF/	"2019 Baseline Emission Factors for Regional Power Grids in China" published by DNA of China https://www.mee.gov.cn/ywgz/ydqbh/wsqtkz/202012/W020201229610353816665.pdf	China DNA website
35.	National Energy Administration, China Electricity Council etc.	China Electric Power Yearbook/CEPY/	China Electric Power Yearbook from 2014 to 2018	China Website
36.	National Bureau of Statistics	China Energy Statistical Yearbook/CESY/	China Energy Statistical Yearbook from 2016 to 2018	China Website
37.	TUV NORD JI / CDM Certification Program	CP Manual/CPM/	TUV NORD JI / CDM CP Manual (incl. CP procedures and forms)	TUV NORD JI / CDM Certification Program
38.	State Administration of Work Safety	Coalmine Safety Regulation/CSR/	Chinese National Coalmine Safety Regulation (valid in 2016)	
39.	National Standard	Technical administration code of meter/DLT/	DL/T 448-2016 technical administration code of electricity energy metering	National Standard Website http://gb-china.cn/
40.	National Development and Reform Commission and Ministry of Construction	Economic Evaluation /EEMP/	"Economic Evaluation Method and Parameters for Construction Projects"	Public Website

No	Author	Title	References to the document	Provider
41.	National Standard	Emission standard/EQSN/	"Environmental quality standard for noise" (GB3096-2008)	Public website
42.	National Standard	Emission standard/ESEN/	Emission standard for industrial enterprise noise at boundary (GB12348-2008)	Public website
43.	China National Energy Administration	Gas-fired power generation safety supervision report/GFPG/	"Gas-fired power generation safety supervision report" published by China National Energy Administration	Public website
44.	Intergovernmental Panel on Climate Change	IPCC Guidelines/IPCC/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp
45.	National law	Income Tax Law /ITL/	Enterprise Income Tax Law of the People's Republic of China	Public Website
46.	VERRA	Joint Template /JPMT/	VCS-Joint-Project-Description-Monitoring-Report-Template-v4.1	VERRA
47.	The State Council	Law of City Construction Tax /LCT/	Law of the People's Republic of China on City Maintenance and Construction Tax	Public website
48.	State Taxation Bureau of Guizhou Province	Local Education Surcharges/LES/	Announcement of the State Administration of Taxation of Guizhou Province on the Collection of Education Fee Surcharges and Local Education Surcharges	Public website
49.	National Government	Law and Regulations/L&R/	1. Renewable Energy Law and Regulations 2. Guidance Catalogue for the Development of Renewable Energy Industry 3. Further Accelerating the Extraction and Utilization of Coalbed Methane (Coal mine Gas) 4. Twelfth Five-Year Plan for The Development and Utilization of Coalbed Methane (Coal mine Gas) 5. "Environmental Protection Law of P.R. China" 6. "Law of the People's Republic of China on the Environmental Impact Assessment"	Public website
50.	General Office of the State Council	Notice on Strictly Prohibiting the Installation/NSP/	Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135 MW or Below, decree no. 2002-6 [Doc-32]	Public websites
51.	On-site audit Team	Photographs/PHT/	Photographs of Jinyan CMM power plant site, Central Control Room, DCS System, all the monitoring devices and nameplate of the equipment taken by VVB during the on-site validation and verification	On-site audit Team
52.	VERRA	Registration and Issuance	Registration and Issuance Process version 4.0	VERRA

No	Author	Title	References to the document	Provider
		Process version 4.0/RIP/		
53.	UNFCCC	UNFCCC Standard /SASS/	UNFCCC Standard “Applicability of sectoral scopes version 01.0”	UNFCCC
54.	National standard	Standard for installation and calibration of flow meter and gas analyzer/SFG/	The national standard JJG 1138-2017 “Non-dispersive Infrared Methane Transmitters for Coal Mine” JJG 640-2016 “Verification regulation of different pressure type flow meter”	National standard
55.	UNFCCC	Methodological tool/TBDA/	“Combined tool to identify the baseline scenario and demonstrate additionality” (version 07.0)	UNFCCC
56.	UNFCCC	Methodological tool/TBPL/	Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0)	UNFCCC
57.	UNFCCC	Methodological tool /TCP/	“Common practice” (version 03.1)	UNFCCC
58.	UNFCCC	Methodological tool/TEF/	“Tool to calculate the emission factor for an electricity system” (version 07.0)	UNFCCC
59.	UNFCCC	Methodological tool/TIA/	“Investment analysis” (version 11.0)	UNFCCC
60.	The State Council	Corporate Income Tax/CIT/	‘Detailed Rules for the Implementation of the Provisional Regulations on Corporate Income Tax of the People's Republic of China’	Public website
61.	National Development and Reform Commission	Value-Added Tax Rate of Power Grid Enterprises/VATP/	Notice of the National Development and Reform Commission on the Adjustment of the Value-Added Tax Rate of Power Grid Enterprises and the Corresponding Reduction of General Industrial and Commercial Electricity Prices http://www.gov.cn/zhengce/zhengcek/2019-09/29/content_5435042.htm	Public website
62.	VERRA	VCS Program Definitions/VCSPD/	VCS Program Definitions, v4.2	VCS website
63.	VERRA	VCS Program Guide/VCSPG/	VCS Program Guide, v4.2	VCS website
64.	VERRA	VCS Standard /VCSS/	VCS Standard, v4.3	VCS website
65.	China CER Exchange Info-platform	China CER/CCER/	http://cdm.ccchina.org.cn/ccer.aspx	Website
66.	China DNA	China cap & trade scheme/cets/	http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html	Public Website
67.	News of CMM	Common practice/cp/	public source http://news.bjx.com.cn/zt.asp?topic=%CD%DF%CB%B9%B7%A2%B5%E7	Public Website

No	Author	Title	References to the document	Provider
68.	China DNA	DNA of China/dna/	http://www.mee.gov.cn/	Website
69.	China DNA	Enforced company list/ec/	http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf	Public Website
70.	Guizhou Provincial Development and Reform Commission	Website/gdrc/	website of Guizhou Provincial Development and Reform Commission http://fgw.guizhou.gov.cn/	Website
71.	Google	Google Earth Map/gem/	earth.google.com	Website
72.	GS	Gold Standard/gs/	http://www.goldstandard.org/	Website
73.	IPCC	IPCC publications/ipcc/	www.ipcc-nggip.iges.or.jp	Website
74.	Ministry of Environmental Protection of China	Environmental Protection/mep/	http://www.zhb.gov.cn/	Website
75.	National Bureau of Statistics of China	Statistic Data/sd/	http://www.stats.gov.cn/tjsj/ndsj/	Website
76.	UNFCCC	UNFCCC/unfccc/	http://cdm.unfccc.int	Website
77.	VCS	VCS/vcs/	https://verra.org/project/vcs-program/	Website

APPENDIX 4: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	<i>n.a</i>	Section no.		Date:
Description of FAR				
Project participant response (1 st round)				Date:
Documentation provided by project participant (1 st round)				
☐	Changes in Joint-PD-MR	Section(s):	New version No.:	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
VVB assessment (1 st round)				Date:
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☐ The finding is closed		

Table 2. CL from this verification

CL ID	01	Section no.	2.2	Date: 08/04/2022
Description of CL				
1. The actual local stakeholder consultation during this monitoring period is not clarified. 2. The description in this section is not totally in line with the request in template of Joint-PD-MR.				
Project participant response (1 st round)				
1. The actual local stakeholder consultation during this monitoring period is included in section 2.2 of the updated JPM. 2. The description in section 2.2 is included the information about the implementation of the LSC during the monitoring period, the mechanism for on-going communication with local stakeholders and how due account of all and any input received during the consultation.				
Documentation provided by project participant (1 st round)				Date: 30/05/2022
☒	Changes in the Joint-PD-MR	Section(s): 2.2	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:	/LSCR-M/		
VVB assessment (1 st round)				Date: 31/05/2022
1. The revised Joint-PD-MR is checked, it is confirmed that the actual local stakeholder consultation during this monitoring period is clarified. 2. The revised Joint-PD-MR is checked, it is confirmed that the description in this section is totally in line with the request in template of Joint-PD-MR. Refer to section 3.3.2 of this report for detail assessment.				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CL ID	02	Section no.	3.5	Date: 08/04/2022
Description of CL				

The prior consideration of carbon revenue is not clarified clearly.			
Project participant response (1st round)			
The prior consideration of carbon revenue is included in section 3.5 of the updated JPM as following. In July 2018 the FSR for the project was completed by China Coal Technology Engineering Group Nanjing Design & Research Institute Co., Ltd. and the project was identified as a project that was not financial feasible without carbon revenue assistance. Therefore, the project owner was suggested to implement the project as a emission reduction mechanism project to make it financially attractive. On 19-October-2018, based on the suggestion of FSR and the survey on similar CMM projects in China, the project owner held a board meeting formally deciding to implement the project activity as a VCS project.			
Documentation provided by project participant (1st round)			Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 3.2	New version No.: 02
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other:	/FSR/, /EPC/, /BMM/	
VVB assessment (1st round)			Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the clarification has been added. Validation team checked the timeline of the milestones of the project, PP decided the project would be developed as VCS project as assessed in the FSR/^{FSR}/ prior to the project started construction. The first major contract signed was the Equipment purchase, signed on 05-April-2019 is verified by checking the Equipment purchase contract/^{EPC}/. This date is confirmed as the earliest date of the project owner commit to making expenditures for the construction or modification of the main equipment or facility, it is verified that the contract signed date of 05-April-2019 is the earliest date of the project owner making expenditures for the equipment. And the board meeting was held on 19-October-2018 by checking the meeting minute/^{BMM}/, it is confirmed that the VCS revenues have been seriously considered for make the investment decision. Hence, it is confirmed that the VCS revenues have played an important role for the investment decision of the project by PP. and thus the prior consideration is verified as satisfied.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CL ID	03	Section no.	3.5	Date: 08/04/2022
Description of CL				
The sensitivity analysis of Annual electricity exported is not based on actual data of the project due to project has been operated for a while.				
Project participant response (1st round)				
The sensitivity analysis of annual electricity exported is included in section 3.5 based on actual data of the project as following. Based on the operation records from 01-Oct-2020 to 31-Dec-2021 of the project, the electricity supplied is 18,071.580 MWh, 41.84% lower than the assumed electricity supplied 31,071 MWh (31,071 MWh =24,816MWh*457 days/365 days).				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 3.5	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:			
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the sensitivity analysis of Annual electricity exported has been updated. Due to the project was operated during the site visit, via checking the actual electricity exported value from electricity transaction notes/^{ETN}/, it is verified that from 01-October-2020 to 31-December-2021 of the project, the electricity supplied is 18,071.580 MWh, 41.84% lower than the assumed electricity supplied 31,071 MWh (31,071 MWh =24,816MWh*457 days/365 days).				

A threshold analysis was conducted by PP and shows if the Annual electricity exported increases 11.21%, the benchmark of 8% will be reached. However, it is impossible for Electricity exported increase so many according to actual generation status.	
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	04	Section no.	5.3	Date: 08/04/2022
Description of CL				
The emergency procedure and if any emergency occurred during this monitoring period is not clarified.				
Project participant response (1st round)				
The emergency procedure and if any emergency occurred during this monitoring period is included in section 5.3 of the updated JPM as following. In case of any failure or malfunction of any monitoring instrument, the project participant and the equipment suppliers will repair or displace it as soon as possible, and the emission reductions achieved during the troubleshooting period will be calculated conservatively. During the reported monitoring period, no emergency occurred, and on event, which might impact the monitoring plan, the applied methodology or the calculation of emission reductions, occurred.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 5.3	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:	/MRR/, /GMD/		
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the clarification has been added. Project participant and meter supplier will take actions to maintains or will displace the broken meter(s) if any malfunction, and the monitoring data will be calculated conservatively for emission calculations during the meter troubleshooting period. For this monitoring period, via checking the continuous electricity data ^{/MRR/} and gas data ^{/GMD/} , it is verified that there was no emergency occurred.				
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	05	Section no.	1.11	Date: 08/04/2022
Description of CL				
The actual operation situation during this monitoring period is not clarified.				
Project participant response (1st round)				
The actual operation situation during the monitoring period is included in section 1.11 as following. In the first monitoring period from 01-October-2020 to 31-December-2021, eight set of CMM power generators have been installed as per the design, and seven sets of CMM power generators with total capacity of 4.2 MW have been put into generation due to insufficient CMM supply. No events or situations, which may impact the applicability of the applied methodology, occurred during this monitoring period.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 1.11	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:	/LOG/, /GMD/, /SCA/		
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the clarification has been added. Via on-site investigation, it is confirmed that during this monitoring period, not all the CMM generators have been operated to generate the electricity due to a lower level of CMM availability than initially expected which has been confirmed by site interview with the operation staffs and checking the Gas Monthly Data ^{/GMD/} . Via checking the operation log ^{/LOG/} , it is confirmed that 7 generators were put into				

operation with installed capacity of 4.2 MW (7*0.6MW) which has been verified by checking the Statement about the CMM availability of Jinyan CMM power plant provided by the project proponents/ ^{SCA} .	
And via site inspection and checking the operation log/ ^{LOG} , it is confirmed that there were no events for the normal operation of the 7 generators at CMM power plant occurred.	
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	06	Section no.	6.1	Date: 08/04/2022
Description of CL				
For parameter EC _{PJ,j,y} ,				
1. PP stated that the electricity consumed by the project is imported from CSPG to the power station through coal mine, but the power purchase agreement was signed between the project owner and grid company, the related clarification is requested.				
2. Description of M ₂ is missing.				
Project participant response (1st round)				
1. The description regarding EC _{PJ,j,y} is revised in section 6.1 of the updated JPM as following. For the project, the electricity consumed by the project was imported from the coal mine and the grid, which was measured by electricity meters M1 and M2 installed at the onsite substation. EC _{PJ,j,y} was measured by the sum of monitored data of M1 and M2.				
2. The description of M2 is included in section 6.1.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 6.1	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:			
VVB assessment (1st round)				Date: 31/05/2022
1. The revised Joint-PD-MR is checked, it is confirmed that the clarification has been added. EC_{PJ,j,y} is measured continuously by bidirectional electricity meters M1 and M2 installed at the onsite substation with accuracy of 0.5s and recorded monthly. EC _{PJ,j,y} was measured by the sum of monitored data of M1 and M2, which is verified as correct by site inspection and checking the Power Purchase Agreement/PPA/ and Gas Cooperative Development and Utilization Agreement signed between project owner and coal mine/ ^{GCA}				
2. The revised Joint-PD-MR is checked, it is confirmed that the description of M2 is added. Refer to above assessment.				
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

Table 3.CAR from this verification

CAR ID	01	Section no.	1.1	Date: 08/04/2022
Description of CAR				
The actual period of this monitoring period and actual ER achieved is missing in section 1.1.				
Project participant response (1st round)				
The actual period of the monitoring period from 01-October-2020 to 31-Deceber-2021 and actual ER achieved 126,134 tCO _{2e} is included in section 1.1 of the update JPM.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 1.1	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
VVB assessment (1st round)				Date: 31/05/2022

The revised Joint-PD-MR is checked, it is confirmed that the actual period of this monitoring period and actual ER achieved is added. In the monitoring period from 01-October-2020 to 31-December-2021, total 4,654.77 tCH₄ was captured and utilized and the net electricity supplied to the Jinyan coal mine for captive use and supplied to grid is totally 18,071.580 MWh. The total verified carbon units (VCUs) achieved in the monitoring period are 126,134 tCO₂e, which has been verified by on-site inspection, and checking the related documentations, interview with the project implementer.	
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	02	Section no.	1.4&1.10	Date: 08/04/2022
Description of CAR				
The information provided in the section 1.4 and 1.10 is not in line with the JPM template.				
Project participant response (1st round)				
The information provided in section 1.4 and 1.10 is revised according to the JPM template.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s):	1.4&1.10	New version No.: 02
☐	Changes in XLS	Worksheet(s):		New version No.:
☐	Other:			
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the information provided in the section 1.4 and 1.10 is updated to be in line with the JPM template, the draft project description for the purpose of listing on the pipeline has been deleted accordingly.				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	03	Section no.	1.12	Date: 08/04/2022
Description of CAR				
The project location is not clearly shown in the figure 1-2 in section 1.12.				
Project participant response (1st round)				
The project location map is changed with clear version in the figure 1-2 in section 1.12 of the updated JPM.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s):	1.12	New version No.: 02
☐	Changes in XLS	Worksheet(s):		New version No.:
☐	Other:			
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the project location is clearly and correctly shown in the figure 1-2 in section 1.12.				
The location of the project site is verified as consistent with on-site investigation by GPS devices.				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	04	Section no.	1.16	Date: 08/04/2022
Description of CAR				
The information provided in the section 1.16 is not in line with the JPM template.				
Project participant response (1st round)				
The information provided in the section 1.16 is revised as per the JPM template.				
Documentation provided by project participant (1st round)				Date: 30/05/2022

☒	Changes in Joint-PD-MR	Section(s): 1.16	New version No.: 02
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		
VVB assessment (1st round)			Date: 31/05/2022
The revised Joint-PD-MR is checked, it is confirmed that the information provided in the section 1.16 is updated to be in line with the JPM template, the draft project description for the purpose of listing on the pipeline has been deleted accordingly.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	05	Section no.	3.3	Date: 08/04/2022
Description of CAR				
The diagram of the project boundary in Figure 3-1 is not clear, how the project supplied and imported electricity from grid is not shown clearly and the energy flow is not completed.				
Project participant response (1st round)				
The diagram of the project boundary in Figure 3-1 is revised in section 3.3. The total electricity supplied to the coal mine and the grid and the electricity imported from the coal mine and the grid are monitored by the bidirectional electricity meters (M1 and M2) installed at the onsite substation. $EG_{use,k,y}$ ($EG_{PJ,grid,y}$) and $EC_{PJ,j,y}$ are measured by the sum of monitored data of M1 and M2.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 3.3	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:			
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is verified the diagram of the project boundary in Figure 3-1 is updated, which is verified as correct by site inspection and checking the Power Purchase Agreement/PPA/ and Gas Cooperative Development and Utilization Agreement signed between project owner and coal mine/ ^{GCA/}				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	06	Section no.	3.5	Date: 08/04/2022
Description of CAR				
The time for stakeholder meeting listed in table 3-4 is not same to the section 2.2.				
Project participant response (1st round)				
It was a typo regarding the time of stakeholder meeting and it has been revised to 12-June-2019 in section 2.2.				
Documentation provided by project participant (1st round)				Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 3.5	New version No.: 02	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☒	Other:	/LSCR/		
VVB assessment (1st round)				Date: 31/05/2022
The revised Joint-PD-MR is checked, it is verified the date has been updated in consistent with the section 2.2 which is verified as correct by checking the record/ ^{LSCR/} .				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	07	Section no.	6.1	Date: 08/04/2022
Description of CAR				

For the monitored parameter $EG_{use,k,y}$			
1. PP stated that for the project, the surplus electricity delivered to CSPG is not included in the emission reduction calculation, which is not same to the other parts of the JPM. 2. PP stated that electricity supplied to coal mine was measured by electricity meter M₁, while, based on the location of the meter, it monitored both the electricity supplied to coal mine and grid, revision is requested. 3. The description of electricity meter M₂ is not specified. 4. The cross-check result is not provided.			
Project participant response (1st round)			
The monitoring parameter $EG_{use,k,y}$ has been revised as follows:			
1. It was deleted the description of "the surplus electricity delivered to CSPG is not included in the emission reduction calculation" in section 6.1. 2. The total electricity supplied to the coal mine and the grid was monitored by the bidirectional electricity meters M1 and M2 installed at the onsite substation. $EG_{use,k,y}$ ($EG_{PJ,grid,y}$) was measured by the sum of monitored data of M1 and M2. 3. The description of electricity meter M2 is included. 4. Electricity transaction notes have been provided for crosscheck and the cross-check result is included in the ER calculation sheet.			
Documentation provided by project participant (1st round)			Date: 30/05/2022
☒	Changes in Joint-PD-MR	Section(s): 5.3	New version No.: 02
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other:	/ETN/, /MRR/	
VVB assessment (1st round)			Date: 31/05/2022
1. The revised Joint-PD-MR is checked, it is verified that the wrong description has been updated and consistent in the whole JPM. 2. The revised Joint-PD-MR is checked, it is verified that the related information has been added. Total electricity supplied to the coal mine and the grid $EG_{use,k,y}$ is measured continuously by bidirectional electricity meters M1 and M2 installed at the onsite substation with accuracy of 0.5s and recorded monthly. $EG_{use,k,y}$ was measured by the sum of monitored data of M1 and M2, which is verified as correct by site inspection and checking the Power Purchase Agreement/PPA/ and Gas Cooperative Development and Utilization Agreement signed between project owner and coal mine/GCA/. 3. The revised Joint-PD-MR is checked, it is confirmed that the description of M2 is added. Refer to above assessment. 4. The revised Joint-PD-MR is checked, it is verified that the cross-check result is accurate which is confirmed as consistent by comparing the meter data/^{MRR}/ with ETNs/^{ETN}/.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

Table 4.Remaining FAR from next verification

FAR ID	<i>n.a</i>	Section no.		Date:
Description of FAR				
Project participant response (1st round)				Date:
Documentation provided by project participant (1st round)				
VVB assessment (1st round)				Date:
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☐ The finding is closed		

APPENDIX 5 MONITORED PARAMETERS

Table A-1: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A. $MT_{PJ,s,i,y}$		Methane from source s captured and destroyed by use i in the project activity in year y		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.</i>	/I1/ /GMD/ /LOG/ /JPM/ /O&M/ /PPA/ /PWD/ /ACM000 8/	Description: $MT_{PJ,s,i,y}$ is measured continuously by the Flow meter and gas analyzer. Flow meter and gas analyzer are installed at this CMM power plant. $MT_{PJ,s,i,y}$ is continuously measured and monthly recorded by DCS system automatically. The $MT_{PJ,s,i,y}$ is calculated based on the value of gas flow rate, pressure, temperature measured by Flow meter and CH₄ concentration of CMM measured by gas analyzer. The calculation is done by the DCS system automatically. The Flow meter and gas analyzer monitors the Methane captured and destroyed by the power generations. And the calculation is done by the DCS system automatically. The meter readings and calculation result are recorded by the operation staff of this CMM power plant aggregated monthly. Meanwhile, the automatic monitoring DCS system of this CMM power plant collects the data from the meter and gas analyzer every day and delivers them to the project owner. Neither failure nor exchange of meters was detected during the monitoring period. The data aggregation procedure applied by the PP is shown as follow: $MT_{PJ,s,i,y}$ is measured continuously by flow meter and gas analyzer of this CMM power plant, the operators read the value from the devices monthly. Accordingly the operator issues the monthly reports. The monthly reports record the quantities of gross methane sent to the power generators per month. - Based on the monthly reports, the final monthly value was	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		reported in the monitoring report. <i>Verifier's action:</i> This was verified by on-site interview, by observations and by cross checking with calibration records, Joint-PD-MR and applied methodology against the ER calculation spreadsheet. Furthermore, the following actions have been taken by the verification team to check the correctness of the data aggregation. The reported value in the Joint-PD-MR has been recalculated by the verification team based on the values from the monthly reports. Based on monthly reports and the underlying original data, the verification team calculated the data aggregation completely independent from the calculation provided by the PP. 100% of the monthly reports have been verified. <i>Conclusion:</i> The actual Measurement / Determination method for this monitoring period is specified.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/I1/ /CAL/ /CMA/ /GMD/ /LOG/ /JPM/ /O&M/ /PPA/ /SFG/ /PWD/ /QA/ /TCR/ /ACM000 8/ /FMCS/ /PHT/	<i>Description:</i> Refer to Appendix 6 for the accuracy details of each meter. The calibrations of all the meters were performed annually by a qualified 3rd party entity according to national industry standard and records maintained. QA/QC procedure for meter calibration maintenance and recording; procedure for monitoring staff training and competence were established and implemented. The data flow and protection process was observed during the on-site verification. In case the meter is out of order, no emission reductions will be claimed. The calibration is valid for the entire monitoring period. The monitored data will be kept for two years after the last issuance of VCU. <i>Verifier's action:</i> The above mentioned was verified by cross checking the meter readings, the DCS calculation result and calibration records against the Joint-PD-MR, internal audit records and ER sheet against the Joint-PD-MR. Further, an on-site interview has been conducted and	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		the procedures for meter calibration maintenance and recording as well as for monitoring staff training and competence have been cross checked. <i>Conclusion:</i> The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.		
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/GMD/ /LOG/ /JPM/ /QA/ /TCR/ /XLS/ /ACM0008/	☒ Correct ☐ Not correct (initial assessment) <i>Description:</i> The $MT_{PJ,s,l,y}$ during this monitoring period 01-October-2020 to 31-December-2021 is reported as 4,654.77 tCH₄ (while 781.64 tCH₄ from 01-October-2020 to 31-December-2020 and 3,873.13 tCH₄ from 01-January-2021 to 31-December-2021) in the Joint-PD-MR based on the value of gas flow rate, pressure, temperature measured by Flow meter and CH₄ concentration of CMM measured by gas analyzer. The calculation is done by the DCS system automatically. <i>Verifier's action:</i> By means of checking the ER-spreadsheet against the monthly value of gas flow rate, pressure, temperature measured by Flow meter and CH₄ concentration of CMM measured by gas analyzer against the automatic calculation done by the DCS system, the internal audit record and daily log. <i>Conclusion:</i> The value calculated in the Joint-PD-MR is in line with the value in the evidence, thus verified as correct.	OK	OK
B. $MM_{ELEC,y}$		Methane measured sent to use of power generation in year y		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other	/I1/ /GMD/ /LOG/ /JPM/ /O&M/ /PPA/ /PWD/	<i>Description:</i> $MM_{ELEC,y}$ is measured continuously by the Flow meter and gas analyzer. Flow meter and gas analyzer are installed at this CMM power plant. $MM_{ELEC,y}$ is continuously measured and monthly recorded by DCS system automatically. The $MM_{ELEC,y}$ is calculated based on the value of gas flow rate, pressure, temperature measured by Flow meter	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.</i>	/ACM0008/	and CH₄ concentration of CMM measured by gas analyzer. The calculation is done by the DCS system automatically. The Flow meter and gas analyzer monitors the Methane captured and destroyed by the power generations. And the calculation is done by the DCS system automatically. The meter readings and calculation result are recorded by the operation staff of this CMM power plant aggregated monthly. Meanwhile, the automatic monitoring DCS system of this CMM power plant collects the data from the meter and gas analyzer every day and delivers them to the project owner. Neither failure nor exchange of meters was detected during the monitoring period. The data aggregation procedure applied by the PP is shown as follow: 1. MM_{LEEC,y} is measured continuously by Flow meter and gas analyzer of this CMM power plant, the operators read the value from the meters monthly. Accordingly the operator issues the monthly reports. The monthly reports record the quantities of gross methane sent to the power generators per month. 2. Based on the monthly reports, the final monthly value was reported in the monitoring report. Verifier's action: This was verified by on-site interview, by observations and by cross checking with calibration records, Joint-PD-MR and applied methodology against the ER calculation spreadsheet. Furthermore, the following actions have been taken by the verification team to check the correctness of the data aggregation. The reported value in the Joint-PD-MR has been recalculated by the verification team based on the values from the monthly reports. Based on monthly reports and the underlying original data, the verification team calculated the data aggregation completely independent from the calculation provided by the PP. 100% of the monthly reports have been verified. Conclusion:		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The actual Measurement / Determination method for this monitoring period is specified.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/I1/ /CAL/ /CMA/ /GMD/ /LOG/ /JPM/ /O&M/ /PPA/ /SFG/ /PWD/ /QA/ /TCR/ /ACM0008/ /FMCS/ /PHT/	Description: Refer to Appendix 6 for the accuracy details of each meter. The calibrations of all the meters were performed annually by a qualified 3 rd party entity according to national industry standard and records maintained. QA/QC procedure for meter calibration maintenance and recording; procedure for monitoring staff training and competence were established and implemented. The data flow and protection process was observed during the on-site verification. In case the meter is out of order, no emission reductions will be claimed. The calibration is valid for the entire monitoring period. The monitored data will be kept for two years after the last issuance of VCU. Verifier's action: The above mentioned was verified by cross checking the meter readings, the DCS calculation result and calibration records against the Joint-PD-MR, internal audit records and ER sheet against the Joint-PD-MR. Further, an on-site interview has been conducted and the procedures for meter calibration maintenance and recording as well as for monitoring staff training and competence have been cross checked. Conclusion: The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.	OK	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i>	/GMD/ /LOG/ /JPM/ /QA/ /TCR/ /XLS/	☒ Correct ☐ Not correct (initial assessment) Description: The MM_{elec,y} during this monitoring period 01-October-2020 to 31-December-2021 is reported as 4,654.77 tCH ₄ (while 781.64 tCH ₄ from 01-October-2020 to 31-December-2020 and 3,873.13 tCH ₄ from 01-January-2021 to 31-December-2021) in the Joint-PD-MR based on the value of gas flow rate, pressure, temperature measured by Flow meter and CH ₄ concentration of CMM measured	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/ACM0008/	by gas analyzer. The calculation is done by the DCS system automatically. <i>Verifier's action:</i> By means of checking the ER-spreadsheet against the monthly value of gas flow rate, pressure, temperature measured by Flow meter and CH ₄ concentration of CMM measured by gas analyzer against the automatic calculation done by the DCS system, the internal audit record and daily log. <i>Conclusion:</i> The value calculated in the Joint-PD-MR is in line with the value in the evidence, thus verified as correct.		
C. GWP_{CH4}		Global warming potential of methane		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.	/ACM0008/ /JPM/ /AR5/ /VCSS/	Description: GWP_{CH4} is a default value from IPCC Fifth Assessment Report (AR5) ^{/AR5/} which is confirmed in line with the VCS Standard Version 4.3 ^{/VCSS/} . <i>Verifier's action:</i> The value has been verified against the IPCC Fifth Assessment Report (AR5) ^{/AR5/} . <i>Conclusion:</i> The determination method is verified as correct.	OK	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.	/ACM0008/ /JPM/ /AR5/ /VCSS/	Description: GWP_{CH4} is a default value from IPCC Fifth Assessment Report (AR5) ^{/AR5/} . <i>Verifier's action:</i> Any update from VERRA will be checked. <i>Conclusion:</i> There is no change for this MP.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.				
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/ACM0008/ /JPM/ /AR5/ /VCSS/	☒ Correct ☐ Not correct (initial assessment) Description: The GWP_{CH4} is 28 tCO ₂ e/ tCH ₄ for this monitoring period that is determined as per IPCC Fifth Assessment Report (AR5) ^{/AR5/} default value which is confirmed as the correct value. Verifier's action: By means of checking the IPCC Fifth Assessment Report (AR5) ^{/AR5/} Conclusion: The value given in the monitoring report is correct.	OK	OK
D. EG_{use,k,y} (EG_{PJ,grid,y})		Energy of type k displaced by the project activity in year y		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.	/I1/ /ETN/ /LOG/ /JPM/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM0008/	Description: In this monitoring period, all electricity generated by the project supplied to Jinyan coal mine&grid which has been confirmed by checking the meter reading records ^{/MRR/} and electricity transaction notes ^{/ETN/} . Total electricity supplied to the coal mine and the grid EG_{use,k,y} is measured continuously by bidirectional electricity meters M1 and M2 installed at the onsite substation with accuracy of 0.5s and recorded monthly. EG _{use,k,y} was measured by the sum of monitored data of M1 and M2. The meters monitor the electricity generated by the project supplied to Jinyan coal mine&grid. The meter readings are recorded by the operators monthly. Meanwhile, the automatic monitoring system will collect the data from the meters every month and deliver them to the PP. The meter readings are recorded by the PP, based on that, related monthly electricity transaction notes have been issued. Neither failure nor exchange of electricity meters were detected during the monitoring period.	CAR-07	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The data aggregation procedure applied by the PP is shown as follow: $EG_{PJ,grid,y}$ is measured continuously by electricity meters, the operators read the value from the electricity meters per month. Based on the difference between the two meter values, the electricity supplied for that month is determined. Accordingly the operator issues the monthly reports. The monthly reports record the quantities of gross electricity supplied per month. - Based on the monthly reports, the final monthly value was reported in the monitoring report. <i>Verifier's action:</i> This was verified by on-site interview, by observations and by cross checking with calibration records, meter reading records and electricity transaction notes, Joint-PD-MR and applied methodology against the ER calculation spreadsheet. Furthermore, the following actions have been taken by the verification team to check the correctness of the data aggregation. The reported value in the MR has been recalculated by the verification team based on the values from the monthly reports. Based on monthly reports and the underlying original data, the verification team calculated the data aggregation completely independent from the calculation provided by the PP. 100% of the monthly reports have been verified. The meter reading record values have been cross-checked with monthly electricity transaction notes. <i>Conclusion:</i> The actual Measurement / Determination method for this monitoring period is specified. However, CAR 07 was raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the</i>	/I1/ /CAL/ /CMA/ /ETN/ /LOG/	<i>Description:</i> $EG_{PJ,grid,y}$ is measured continuously by electricity meters with accuracy of 0.5s and recorded monthly.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.	/JPM/ /MRR/ /O&M/ /PPA/ /PWD/ /QA/ /TCR/ /ACM0008/ /JJG/ /DLT/ /PHT/	The calibration of all the meters were performed annually by a qualified 3rd party entity according to national industry standard and records maintained. QA/QC procedure for meter calibration maintenance and recording; procedure for monitoring staff training and competence were established and implemented. The data flow and protection process was observed during the on-site verification. In case the meter is out of order, no emission reductions will be claimed. The calibration is valid for the entire monitoring period. The monitored data will be kept for two years after the last issuance of VCU. <i>Verifier's action:</i> The above mentioned was verified by cross checking the monthly electricity transaction notes, the meter readings and calibration records against the MR, internal audit records and ER sheet against the MR. Further, an on-site interview has been conducted and the procedures for meter calibration maintenance and recording as well as for monitoring staff training and competence have been cross checked. <i>Conclusion:</i> The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.		
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/ETN/ /LOG/ /JPM/ /MRR/ /QA/ /TCR/ /XLS/ /ACM0008/	☒ Correct ☐ Not correct (initial assessment) <i>Description:</i> The electricity of EG_{PJ,grid,y} during period 01-October-2020 to 31-December-2021 is reported as 18,071.580 MWh (while 3,197.400 MWh from 01-October-2020 to 31-December-2020 and 14,874.180 MWh from 01-January-2021 to 31-December-2021) in the MR based on the meters readings and cross check with electricity transaction notes. <i>Verifier's action:</i> By means of checking the ER-spreadsheet against the monthly electricity transaction notes and meter reading records, the internal audit record and daily log.	CAR-07	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> CAR 07 was raised.		
E. $EC_{PJ,j,y}$		Quantity of electricity consumed by the project electricity consumption source j in year y		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.</i>	/I1/ /LOG/ /JPM/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM000 8/	<i>Description:</i> In this monitoring period, all electricity consumed by the project is imported from the coal mine and the grid which has been confirmed by checking the meter reading records^{/MRR/}. $EC_{PJ,j,y}$ is measured continuously by bidirectional electricity meters M1 and M2 installed at the onsite substation with accuracy of 0.5s and recorded monthly. $EC_{PJ,j,y}$ was measured by the sum of monitored data of M1 and M2. Neither failure nor exchange of electricity meters were detected during the monitoring period. <i>Verifier's action:</i> This was verified by on-site interview, by observations and by checking with calibration records, meter reading records, Joint-PD-MR and applied methodology against the ER calculation spreadsheet. <i>Conclusion:</i> The actual measurement is provided. However, CL 06 was raised.	CL-06	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/I1/ /CAL/ /CMA/ /LOG/ /JPM/ /MRR/ /O&M/ /PPA/ /PWD/ /QA/	<i>Description:</i> $EC_{PJ,j,y}$ is measured continuously by electricity meters installed in project site with accuracy of 0.5s and recorded monthly. The calibration of the meter were performed annually by a qualified 3rd party entity according to national industry standard and records maintained. QA/QC procedure for meter calibration maintenance and recording; procedure for monitoring staff training and competence were established and implemented. The data flow and protection process was observed during the on-site verification. In case the meter is out of order, no emission reductions will be claimed.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.	/TCR/ /ACM0008/ /JJG/ /DLT/ /PHT/	The calibration is valid for the entire monitoring period. The monitored data will be kept for two years after the last issuance of VCUs. <i>Verifier's action:</i> The above mentioned was verified by checking the meter readings and calibration records against the Joint-PD-MR, internal audit records and ER sheet against the Joint-PD-MR. Further, an on-site interview has been conducted and the procedures for meter calibration maintenance and recording as well as for monitoring staff training and competence have been cross checked. <i>Conclusion:</i> The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/LOG/ /JPM/ /MRR/ /QA/ /TCR/ /XLS/ /ACM0008/	☒ Correct ☐ Not correct (initial assessment) <i>Description:</i> The electricity of $EC_{PJ,y}$ during period 01-October-2020 to 31-December-2021 is reported as 1.800 MWh (while 1.800 MWh from 01-October-2020 to 31-December-2020 and 0 MWh from 01-January-2021 to 31-December-2021) in the MR based on the meters readings and cross check with electricity transaction notes. <i>Verifier's action:</i> By means of checking the ER-spreadsheet against the meter reading records, the internal audit record and daily log. <i>Conclusion:</i> The value given in the monitoring report is correct.	OK	OK
F. $Eff_{ELEC,y}$ ($Eff_{i,y}$)		Efficiency of methane destruction in use i (for the project, i represents power generation)		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level but also describe the applied data aggregation trails (from ODL to data aggregation level zero).</i>	/IPCC/ /ACM0008/ /JPM/	<i>Description:</i> $Eff_{ELEC,y}$ is an IPCC default value. <i>Verifier's action:</i> The value has been verified against the IPCC default value. <i>Conclusion:</i> The determination method is confirmed as correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the Joint-PD-MR,D and the applied methodology.				
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.	/IPCC/ /ACM000 8/ /JPM/	Description: Eff_{ELEC,y} is an IPCC default value. Verifier's action: Any update from IPCC will be checked. Conclusion: There is no change for this MP.	OK	OK
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/IPCC/ /ACM000 8/ /JPM/	☒ Correct ☐ Not correct (initial assessment) Description: The Eff_{ELEC,y} is 99.5% for this monitoring period that is determined as per IPCC default value which is confirmed as the correct value. Verifier's action: By means of checking the IPCC default value. Conclusion: The value given in the monitoring report is correct.	OK	OK

APPENDIX 6: CALIBRATION DATES AND VALIDITY OF INSTALLED MONITORING EQUIPMENT

Monitoring equipment		Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this MP)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Electricity meter M ₁		EG _{use,k,y} (EG _{PJ,grid,y}) EC _{PJ,j,y}	18042200 0210	DSZ88	0.5s	10-Sep-2020	10-Sep-2021	10-Sep-2020 to 09-Sep-2022	☒ No ☐ Yes	From: To:
Electricity meter M ₂			20085435 6700	DTSD188S	0.5s	10-Sep-2020	10-Sep-2021	10-Sep-2020 to 09-Sep-2022	☒ No ☐ Yes	From: To:
Flow meter for methane	Flow Meter	MT _{PJ,s,i,y} MM _{ELEC,y}	198888	GD3(B)	0.10	13-Sep-2020	03-June-2021	13-Sep-2020 to 02-June-2022	☒ No ☐ Yes	From: To:
	Pressure sensor				0.03				☒ No ☐ Yes	From: To:
	Temperature sensor				0.05				☒ No ☐ Yes	From: To:
Gas analyzer		MT _{PJ,s,i,y} MM _{ELEC,y}	1267	GJG100H(C)	0~1% methane: ± 0.07%; 1%~100% methane: ± 7%	13-Sep-2020	03-June-2021	13-Sep-2020 to 02-June-2022	☒ No ☐ Yes	From: To:

APPENDIX 7: ASSESSMENT OF FINANCIAL PARAMETERS

☐	No financial parameters are used for additionality justification
☒	Assessment of all financial parameters see below

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
Total static investment	32.2	million CNY	FSR page 64	/FSR/ /EPC/ /CC/	☒	The value has been derived from the FSR. The Total static investment of the project is 32.2 million CNY according to FSR including engineering, construction and equipment which is in line with national and local standards. Due to the project was operated during the site visit, via checking all the signed equipment purchase contracts and installation, construction contracts for the actual cost, it is verified that the real expenditure of 30.8 million CNY accounted for more than 95.68% the Total static investment due to not all generators have been purchased and installed as initially designed as assessed above. Finally, a threshold analysis was conducted by PP and shows if the Fixed assets investment decrease 19.53%, the benchmark of 8% will be reached. However, it is impossible for investment decrease so many, as the actual investment already accounted for more than 95.68% the Total static investment in FSR. Therefore, it is unlikely to improve the economic attraction due to the decrease in Total static investment.
Annual electricity exported	26,400	MWh	FSR page 67	/FSR/ /ETN/ /GFPG/	☒	The value has been derived from the FSR. The expected annual electricity generation of the project is 26,400MWh (i.e. 26,400MWh=4.8MW x 5,500h), 6% of which will be used for Internal consumption, thus the expected annual electricity exported for the project is 24,816 MWh (i.e. 24,816MWh=26,400MWh x (1-6%))

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
						The annual operating hour is 5,500h, and equivalent power load factor is 62.8%. According to “Gas-fired power generation safety supervision report” published by China National Energy Administration/GFPG/, utilization hours of Gas-fired power generation operation hours in China vary from 2,045 hours to 5,345 hours with average value is 3,450 hours. The value is within the range and higher than average, thus assessed to be convincing and reasonable. Furthermore, according to the “Guidelines for the reporting and validation of plant load factors (version 01)” issued by EB48 as Annex 11, validation team verified the following documents: a) Feasibility study report carried out by China Coal Science and Industry Group Nanjing Design and Research Institute Co., Ltd./FSR/; b) Approval of Feasibility study report issued by Development and Reform Commission of Dafang County/AP/; c) The certification of China Coal Science and Industry Group Nanjing Design and Research Institute Co., Ltd./FSR/. The Annual electricity exported for the Project is impacted by generator performance and availability and stability of CMM supply. Due to the project was operated during the site visit, via checking the actual electricity exported value from electricity transaction notes/ETN/, it is verified that from 01-October-2020 to 31-December-2021 of the project, the electricity supplied is 18,071.580 MWh, 41.84% lower than the assumed electricity supplied 31,071 MWh (31,071 MWh = 24,816MWh*457 days/365 days). A threshold analysis was conducted by PP and shows if the Annual electricity exported increases 11.21%, the benchmark of 8% will be reached. However, it is impossible for Electricity exported

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
						increase so many, as the low concentration of CMM or fluctuation of CMM volume will reduce the effective operation hour. Therefore, it is unlikely to improve the economic attraction due to the increase in Annual electricity exported.
Electricity Tariff (tax included)	0.484	CNY /kWh	FSR page 66	/FSR/ /PPA/ /GCA/	☒	The applied electricity tariff is derived from the FSR. For the project, the expected Electricity tariff of 0.484 CNY/kWh (incl. VAT) applied in the approved FSR was the most recently available at the time of the investment decision. Due to the project was operated during the site visit, via checking the actual electricity tariff value from Gas Cooperative Development and Utilization Agreement signed with coal mine/GCA/and PPA signed with grid company/PPA/, it is verified that the actual electricity tariff supplied to coal mine and the grid is 0.412 RMB/kwh (VAT) and 0.4754 RMB/kwh (VAT) respectively which are lower than the estimated value in the FSR. The sensitivity analysis shows if the tariff increases by 11.21%, the project IRR would hit the benchmark of 8%. However, the actual electricity tariff is lower than the FSR value. In addition, the tariff is determined by all the parties, if the tariff is determined, it is not likely to change frequently. Hence, it is unlikely for the tariff increases by 11.21% for every year in the whole project lifetime. Therefore, it is unlikely to improve the economic attraction due to the increase in Electricity Tariff.
Annual O&M cost	7,875,417	CNY	FSR page 66	/FSR/ /EEMP/ /GCA/ /sd/	☒	The Annual O&M cost is derived from the FSR. It encompasses sub-items of Repair cost, Staff salary and welfare, Material fee, Insurance fee as well as other cost. The repair fee is calculated as 5% of the fixed assets investment. This rate of the repair & maintenance cost is assessed as reasonable by checking the “Economic Evaluation Method and Parameters for Construction Projects”/EEMP/. The Salary is 60,000CNY/year/person and welfare rate is 50% of the salary. The total employees are 22 persons. Thus total is 1.98

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
						million CNY/year. Insurance fee is calculated as 0.3% of total statistic investment. Other costs are calculated as 1.5 million CNY/year. The material fee includes oil fee, CMM fee and water fee etc. CMM fee is the product of CMM volume and CMM price. CMM volume has been determined in the FSR by considering actual production conditions. CMM price has been fixed by the contract signed between the project proponent and the coal mine which supplies the extracted CMM/^{GCA/}. Via checking the Gas Cooperative Development and Utilization Agreement/^{GCA/}, it is verified that the CMM cost is 0.2RMB/m³ which is same to the estimated value in FSR of 0.2 RMB/m³, thus the value in FSR is deemed as reasonable. In addition, via checking the statistics data/^{sd/}, the indices of urban employees' wages were 110.1, 108.9, 110.0, 110.9 and 109.8 for the recent five years and the purchase indices of industrial producers were 93.9, 98, 108.1, 104.1 and 99.3 for the recent five years and therefore will not cause significant decrease. Finally as shown in the threshold analysis, the benchmark will be reached when the annual O&M cost decreased by 16.84%. Considering the increase of material price and labour cost in China/^{sd/}, the decrease of O&M by 16.84% is not likely to occur. Therefore, it is unlikely to improve the economic attraction due to the decrease in O&M cost.
Installed Capacity	4.8	MW	FSR page 67	/FSR/ /AP/ /EPC/	☒	The value is derived from the FSR. The capacity is approved/^{AP/} by local authority based on the provided FSR/^{FSR/}. Via site inspection by checking the nameplate of the CMM power generators/^{PHT/}, it is verified that total 8 sets purchased confirmed by checked with contract of the main equipment/^{EPC/}. The validation team is of the opinion that both data sources are credible, reliable and relevant in the context of the considered

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
						parameter.
VAT-Electricity	17%	-	FSR page 67	/FSR/ /VATP/	☒	The tax rate is derived from the FSR/ ^{FSR/} . It is in line with the “Notice of the National Development and Reform Commission on the Adjustment of the Value-Added Tax Rate of Power Grid Enterprises and the Corresponding Reduction of General Industrial and Commercial Electricity Prices”. In the tax reform, VAT for sales electricity is 17% before 01-April-2019. This tax rate of 17% is verified as the correct rate used in FSR which is completed before 01-April-2019.
Municipal maintenance and construction tax	5% (of VAT)	-	FSR page 67	/FSR/ /LCT/	☒	The tax rate is derived from the FSR. According to <i>Law of the People's Republic of China on City Maintenance and Construction Tax (Draft)</i> / ^{LCT/} , the rate of the tax is 5% of VAT.
Surcharge for education	5% (of VAT)	-	FSR page 67	/FSR/ /LES/	☒	The tax rate is derived from the FSR. The tax rate is mandatory and applicable since 1986. According to Announcement of the State Administration of Taxation of Guizhou Province on the Collection of Education Fee Surcharges and Local Education Surcharges/ ^{LES/} , the rate of the tax is 5% of VAT. This rate is widely used by other projects in China.
Income Tax	25	%	FSR page 67	/FSR/ /ITL/	☒	The tax rate is derived from the FSR. It is in accordance with the <i>Enterprise Income Tax Law of the People's Republic of China</i> / ^{ITL/} . The applied Income tax Law is effective since 01/01/2008 and edited in Dec 2018. But the income tax of 25% is not changed. The value used in FSR is confirmed as a reasonable value.
Depreciation period	10	year	FSR page 66	/FSR/ /EEMP/	☒	The depreciation period has been derived from the FSR which has been approved. The “Economic Evaluation Method and Parameters for Construction Projects”/ ^{EEMP/} has been cross checked, it is

Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	ASSESSMENT	
					Correctness of value applied	Comment
						confirmed that the depreciation period of 10 years is in line with the industrial guidance.
Residual value rate	5	%	FSR page 66	/FSR/ /CIT/	☒	The Residual rate of fixed assets has been derived from the FSR. It is prescribed in the 'Detailed Rules for the Implementation of the Provisional Regulations on Corporate Income Tax of the People's Republic of China' /CIT/ that the residual value rate of fixed assets for the projects after the issue date can use 5%. Moreover, the 5% residual value of the project activity assets has been included as a cash inflow in the final year at the end of the assessment period.
Project Lifetime (Period of financial analysis)	10	year	FSR page 66	/FSR/ /EPC/ /EEMP/	☒	The value is derived from the FSR. The lifetime is confirmed as 10 years based on the contract of the main equipment /EPC/. 10 years is a typical Period of financial analysis for this kind of project which is cross-checked by "Economic Evaluation Method and Parameters for Construction Projects" /EEMP/.
Fluid capital	800,000	CNY	FSR page 65	/FSR/ /EEMP/	☒	The liquidity applied in the Joint-PD-MR derived from the FSR. This value has been considered as cash in-flow in the last year which is in line with the financial regulation "Economic Evaluation Method and Parameters for Construction Projects" /EEMP/.