



**Verified Carbon
Standard**

GUIZHOU PANJIANG LOW CONCENTRATION COAL MINE METHANE POWER GENERATION PROJECT PHASE 3



Document Prepared By TÜV NORD CERT GmbH

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Summary:

- **A brief description of the verification and the project**

The project activity developed in Pan County, Liupanshui City, Guizhou Province, P. R. China, is a Coal Mine Methane Power Generation Project, utilizes the coal mine methane (CMM) with methane concentration of 6-30% extracted from coal mines located in Pan County, Liupanshui City, Guizhou Province to generate electricity for captive use. The Project covers three coal mines with five mining areas with total methane resource of 9.8 billion m³ and extractable resources of 3.5 billion m³. The project started operation on 26-May-2011 and it was registered as a CDM project activity in UNFCCC with the Registration Ref. No. 6957 on 06-December-2012. And was allocated with VCS ID 2292.

- **The purpose and scope of verification**

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 monitoring period**

This is the 1st monitoring period started from 26-February-2018 to 25-December-2019 for VCS scheme.

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

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 verification team assessed the project activity's compliance against the VCS Version 4.0, the selected CDM methodology and the project monitoring report. The project is eligible under Project Scope 8. The verification criteria followed the guidance documents provided by VCS included the following:

VCS Version 4.0, VCS Program Guide Version 4.0 and the applied CDM methodology "ACM0008 Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane

capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation" (Version 07).

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

In the course of the verification, 10 Corrective Action Requests (CARs), 2 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

- **Any uncertainties associated with the verification**

There are no uncertainties associated with the verification.

- **Summary of the verification conclusion**

Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) 1st periodical verification of the project, "Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3" (VCS ID 2292) with regard to the relevant requirements of VCS standard Version 4.0. TÜV NORD confirms all verification activities including objectives, scope and criteria, level of assurance, monitoring and monitoring report adhere to VCS Version 4.0 and all associated updated as documented in this report, are complete.

TÜV NORD concludes that the project activity "Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3" in China, as described in the Monitoring Report version 03 of 17-August-2020, meets all relevant requirements for VCS verification activity and correctly applied the methodology ACM0008 Version 07. Hence TÜV NORD is able to certify that the GHG emission reduction from the project during the monitoring period from 26-February-2018 to 25-December-2019 amount to **793,277 tCO₂e**.

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1. INTRODUCTION

1.1 Objective

- Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) 1st periodical verification of the project for the monitoring period from 26-February-2018 to 25-December-2019. The objective of verification is to have an independent review ex-post determination by a DOE 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 version 4.0 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 requirement and is seen as necessary to provide assurance on the generation of VCUs.

1.2 Scope and Criteria

- 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. Verification team assessed and determines 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 1% of the total GHG assertions are considered. The project has generated average of 433,452¹ VCUs per year, and therefore can be considered as a large project per the VCS rules, in regards to its scale, subject to a 1% 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 verification statement reasonably assures 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 Panjiang CBM Development & Utilization Co., Ltd. and it aims to utilize the coal mine methane (CMM) with methane concentration of 6-30% extracted from coal mines located in Pan County, Liupanshui City, Guizhou Province to generate electricity for captive use. The Project covers three coal mines with five mining areas with total methane resource of 9.8 billion m³ and extractable resources of 3.5 billion m³. 38 CMM power generation units with total capacity of 22.8 MW are involved and 36.3 million m³ of methane is utilized by the project annually. No coal bed methane (CBM) or ventilation air methane (VAM) utilization is involved in the project/^{FSR}/ and it is located inside the Panjiang Mining District, Pan County, Liupanshui City, Guizhou Province, China.
- The net electricity supplied to the coal mines for captive use, replacing the equivalent amount of electricity that would have been purchased from the China Southern Power Grid (CSPG) and the captive power plants. Waste heat from the generators have been recovered to provide heat to the coal mines. Emission reductions due to heat replacement are not claimed, it is confirmed as conservative. In the monitoring period from 26-February-2018 to 25-December-2019, total 32,101.75 tCH₄ from CMM was captured and utilized and the net electricity supplied to the coal mines for captive use is 130,616.640 MWh. The total verified carbon units (VCUs) achieved in the monitoring period are **793,277 tCO₂e**, 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 generate electricity to supply to the coal mines displace part of the electricity generated by the grid which is dominated by fossil fuel-fired power plants thus generating green house gas emission reductions and produce financial, social and environmental benefits. The project has resulted in the local sustainable development as described in Section 1 of the

¹ The actual emission reduction for this monitoring period is 793,277 tCO₂e, while the monitoring period covers 668 days, hence the average for annual ER value is calculated by $793,277 \text{ tCO}_2\text{e} / 668 \text{ days} \times 365 \text{ days} = 433,452 \text{ tCO}_2\text{e}$

Monitoring Report. The project was registered as a CDM project activity in UNFCCC with the Registration Ref. No. 6957 on 06-December-2012^{/unfccc/} and the emission reductions will be certified as verified carbon units (VCUs) for this monitoring period.

2. VERIFICATION PROCESS

2.1 Method and Criteria

A project specific Verification and monitoring plan was developed to guide the verification auditing process to ensure efficiency and effectiveness. The purpose of the verification is to present a risk assessment for determining the nature and extent of validation procedures necessary to ensure the risk of auditing error is reduced 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, verification of the monitoring plan and the reported project results were measured for compliance against the following criteria:

- VCS Standard, v4.0/^{VCSS/}
- VCS Program Guide, v4.0/^{VCSPG/}
- VCS Program Definitions, v4.0/^{VCSPD/}

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

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

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

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

2.2 Document Review

The VCS MR/^{MR/} 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 details, data and parameters, and quantification of GHG emission reductions.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the monitoring or to the basic conditions and technical data.

The references used in the course of this verification are summarized in Appendix 2.

The verification was performed basing on the documents check and site inspection/measurements, refer to the section 4 of this report for the 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 verification process. Onsite interviews and information discussions were conducted with project implementer^{/11/}, local officer from EPB^{/12/}, local residents^{/13/} and Project VCS development consultant^{/14/}. The interviews were performed by the verification team on-site (within the project area, in Pan County, Liupanshui 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.	Liu ^{/11/}	Hongxia	Guizhou Panjiang CBM Development & Utilization Co., Ltd. /Vice Director	10/06 /2020	- 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	Zhao Xuejiao
2.	Chen ^{/11/}	Jiangtao	Guizhou Panjiang CBM Development & Utilization Co., Ltd. /Engineer	10/06 /2020 ~11/06/2020	- Procedural aspects of the verification - Maintenance - Environmental aspects - Project ownership	

3.	Gan ^{11/}	Weitao	Guizhou Panjiang CBM Development & Utilization Co., Ltd. / Cai'er CMM Power Plant Chief	10/06/2020	- Calibration procedures - Power generation situation - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Maintenance - Environmental aspects - Job creation - Working environment	Zhao Xuejiao
4.	Zhou ^{11/}	Jingguo	Guizhou Panjiang CBM Development & Utilization Co., Ltd. / Caisan CMM Power Plant Chief	10/06/2020		
5.	Yan ^{11/}	Jiankang	Guizhou Panjiang CBM Development & Utilization Co., Ltd. / Tucheng 13 CMM Power Plant Chief	10/06/2020		
6.	Pu ^{11/}	Jinkui	Guizhou Panjiang CBM Development & Utilization Co., Ltd. / Tucheng 14 CMM Power Plant Chief	11/06/2020		
7.	Sha ^{12/}	Chaoyang	Panjiang City Environment Protection Bureau/ Environmental Monitoring Team leader	10/06/2020	- Local stakeholder communication - Stakeholder comments - Environmental aspects - Environmental protection measurements - Local stakeholder communication - Stakeholder comments	Zhao Xuejiao
8.	Yao ^{13/}	Qiliang	Local residents	11/06/2020		
9.	Tian ^{13/}	Daxing	Local residents	11/06/2020		

10.	Chen/ ¹⁴ /	Genrong	Climate Bridge Ltd./Project Manager	10/06/2020 ~11/06/2020	- Financial aspects - Deviations - Monitoring period - Project activity starting date - Assumptions - Monitoring plan and implementation - Monitoring measurements - Editorial issues of the VCS MR	Zhao Xuejiao
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2.4 Site Inspections

The verification site inspection was conducted on 10~11-June-2020. A ground inspection of the project plan was conducted during the site visit and the verification team interviewed project implementer representative 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: 10/06/2020 ~11/06/2020				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting	Pan County, Liupanshui City, Guizhou Province, P.R. China	10/06/2020	Zhao Xuejiao
2.	On-site inspection Interview with PP Representative and CMM plants Operation Staff	Pan County, Liupanshui City, Guizhou Province, P.R. China	10/06/2020 ~11/06/2020	Zhao Xuejiao
3.	Documents check	Pan County, Liupanshui City, Guizhou Province, P.R. China	11/06/2020	Zhao Xuejiao
4.	Finding Summary	Pan County, Liupanshui City, Guizhou Province, P.R. China	11/06/2020	Zhao Xuejiao
5.	Close Meeting	Pan County, Liupanshui City, Guizhou Province, P.R. China	11/06/2020	Zhao Xuejiao

2.5 Resolution of Findings

Material discrepancies identified in the course of the validation 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 Version 4.0 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 first verification.

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

In the course of the validation 10 Corrective Action Requests (CARs), 2 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

2.5.1 Forward Action Requests

This is the 1st VCS verification, and there is no FAR raised in the validation or previous CDM periodic verification^{VER/}.

2.6 Eligibility for Validation Activities

The VVB TÜV NORD CERT GmbH holds accreditation for both validation and verification for the relevant sectoral Scope 8.

3. VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project started operation on 26-May-2011 and it was registered as a CDM project activity in UNFCCC with the Registration Ref. No. 6957 on 06-December-2012. The crediting period under CDM started on 06-December-2012 and will be expired on 05-December-2022.

The project has been registered as a CCER project on 26-May-2014 (Ref. 012). The crediting period of CCER started on 26-May-2011 and will be expired on 05-December-2022.

The project sought the registration with the VCS Program and claim GHG emission reductions as VCU for this monitoring period, according to VCS requirements the Project Description was submitted for public comment period. The project was allocated with VCS ID 2292. The public comment period started on 09-June-2020 and ended on 09-July-2020 (<https://registry.terra.org/app/projectDetail/VCS/2292>). No comments were received during this period.

The project is located in China and is developed and operated by Guizhou Panjiang CBM Development & Utilization Co., Ltd. which is a Chinese Investment Enterprise^{BL}.

The GHG emission reductions of 305,485 tCO₂ generated from 26-May-2011 to 05-December-2012 by the project has been issued as CCER used for Chinese allowance trading, the period is verified as before the CDM registration time, which can be verified by checking the project dedicated China CCER website.

The 1,680,035 tCO₂ in monitoring period from 06-December-2012 to 25-February-2018 has been issued as CER, which can be verified by checking the project dedicated UNFCCC website.

Via checking all the related dedicate website for GHG schemes, it is verified there is no overlapping of the monitoring period among the different GHG schemes and thus no double counting occurred.

In addition, all credits from 26-February-2018 will be claimed under VCS program as VCU for the project as stressed by PP to avoid double counting.

The team also checked the Gold Standard Registry and the Climate Action Reserve to determine if the project is producing other environmental credits. It was confirmed that the project is not listed on these registries and therefore there is no other environmental credit (for example renewable energy certificate) which has or will be produced by or obtained for the project.

Via on-site interview with the project implementer and checking the project dedicated UNFCCC website <https://cdm.unfccc.int/Projects/DB/RINA1344516913.29/view>, it is verified that the implementation of the project is consistent with the description in the Monitoring Report (MR) and Project Design Document (PDD) and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 26-February-2018 to 25-December-2019.

According to the 3.19.5 of VCS standard version 4.0, "The following applies with respect to projects registered under an approved GHG program which are seeking registration with the VCS Program:

1) For projects registered under the CDM, the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6 of the VCS Project Description Template shall be completed. A validation/verification body shall undertake a validation of same, which shall be accompanied by a validation representation, to provide a gap validation for the project's compliance with the VCS Program rules. “

Hence, based on the PD/^{PD/} provided by PP, the gap validation has been carried out by VVB as below steps and process.

Gap Validation Process, Findings and Conclusion

Method and criteria

The project was registered as a CDM project on 06-December-2012. According to section 3.19.5 of VCS Standard Version 4.0, a further validation shall be completed of the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6 of the VCS Project Description Template. Relevant information is discussed as following.

Document Review:

The validated CDM PDD/^{PDD/}, VCS PD/^{PD/} and the Monitoring Report/^{MR/} submitted by the client and additional background documents related to the project design and operation were reviewed. A complete list of all documents reviewed is included in Appendix 3 of this report.

Interviews and site inspections:

Before and during the on-site visit, the VVB performed interviews with the project participants to confirm the information in the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6 of the VCS Project Description Template/^{PDT/} and to resolve issues identified in the document review.

The project proponent and the consultant were interviewed to confirm selected information and to resolve issues identified in the documents review. Refer to 2.3 and 2.4 of this report for detail description of interviews and site visit topics for both gap validation and verification.

Resolution of any material discrepancy:

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

A Corrective Action Request (CAR) is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

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 first verification.

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

Validation process and findings:

The cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6 of the VCS Project Description Template were discussed in the VCS PD/^{PD}.

Validation of the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 and 2.6² of the VCS Project Description Template are pursuant to Section 3.19.5 of VCS Standard Version 4.0 and Section 4.2.15 of Registration and Issuance Process version 4.0. Requirement set out in Section 3.19.5 of VCS Standard Version 4.0 and Section 4.2.15 of Registration and Issuance Process version 4.0/^{RIP} is fulfilled.

The cover page:

The project title “Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3” has been validated to be the same as the registered CDM project and the project name indicated in the Letter of Approval from China/^{HCA}. The version, date of issue, the entity preparing the relevant section of the PD, and the corresponding contact information has been validated to be correct.

Section 1.1 Summary Description of the project

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

The project is a Coal Mine Methane Power Generation Project, utilizes the coal mine methane (CMM) with methane concentration of 6-30% extracted from coal mines located in Pan County, Liupanshui City, Guizhou Province to generate electricity for captive use. The Project is located in Pan County, Liu Panshui City, Guizhou Province, China. The Project includes three coalmines (Tucheng, Laowuji, Songhe) with five mining areas (Tucheng 13, Tucheng 14, Laowuji Nanyi, Songhe Cai’ er, and Songhe Caisan). The Project covers three coal mines with five mining areas with total methane resource of 9.8 billion m³ and extractable resources of 3.5 billion m³. No coal bed methane (CBM) or ventilation air methane (VAM) utilization is involved in the project. In accordance with the CDM PDD, there are total 38 sets of CMM power generators with the total installed capacity of 22.8MW will be installed to utilize CMM for power generation.

Via checking the CDM PDD/^{PDD} and validation report/^{VAL}, it is confirmed that the scenario existing prior to the implementation of the project as stated in the PD is consistent with PDD and validation report. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

The project activity generates GHG emission reductions by utilizes the low concentration coal mine methane (CMM), that otherwise would be vented into the atmosphere directly and generate

² Via checking the latest version of VCS Project Description Template 4.0, there is no section 2.6 in, thus no assessment related to this section.

electricity to supply to the coal mines 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 expected total emission reduction of the Project in the crediting periods of 10 years is 5,891,867 tCO₂e, and the annual emission reduction is estimated to be 589,187 tCO₂e.

In conclusion, it is verified that the summary Description of the project in section 1.1 is in line with the PD template requirement and all the information has been provided and verified as correct and consistent with CDM PDD and validation report.

Section 1.2 Sectoral Scope and Project Type:

Through the onsite visit, interviewing the project owner and reviewing the project design, it was confirmed that the project was 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 08: Mining/mineral production as per the UNFCCC Standard “Applicability of sectoral scopes version 01.0”. It was confirmed that the project is not a grouped project.

CAR 01 was raised and successfully closed, Refer to Appendix 4 for assessment details.

Section 1.3 Project Eligibility

The PP has described and justified how the project is eligible under the scope of the VCS Program in PD as per the section 2.1.1 of VCS Standard version 4.0. 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 CDM PDD of the project, it is verified 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, 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 4.0, 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.

CAR 02 was raised and successfully closed, Refer to Appendix 4 for assessment details.

Section 1.5 Project Proponent

The project proponent (Guizhou Panjiang CBM Development & Utilization Co., Ltd.) and the contact information reported in section 1.5 of the VCS PD have been confirmed to be correct through checking the HCA/^{HCA} and interviewing with the PP representative through the on-site visit^{11/}.

Section 1.6 Other Entities Involved in the Project

The other Entities Involved in the Project (Climate Bridge Ltd.) and the contact information reported in section 1.6 of the VCS PD have been confirmed to be correct through checking the LOA/^{LOA/} and interviewing with the representative of this company through the on-site visit/^{11/}.

Section 1.7 Ownership

The section 1.7 of the PD has been checked, it is confirmed that the Project Proponents have demonstrate 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/}, Feasibility Study Report (FSR)/^{AFSR/}, and Host Country Approval (HCA)/^{HCA/} issued by China DNA, and the business license of the Guizhou Panjiang CBM Development & Utilization Co., Ltd./^{BL/}, it is verified that the PP has the legal right to control and operate project activity. Furthermore, cross checking the purchasing contract of generators/^{TP/}, and the power purchasing agreement/^{PPA/}, it is also verified the ownership of the plant, equipment and power generating by Guizhou Panjiang CBM Development & Utilization Co., Ltd. Thus, it is confirmed that the project owner has the ownership of the project.

Section 1.8 Project Start Date

The project start date is 26-May-2011, which is verified as the date on which the project began generating GHG emission reductions or removals as per the concept in VCS standard version 4.0.

Via checking the operation log/^{LOG/} and previous CDM verification reports/^{VER/}, it is verified that the start date is correct and in line with the VCS standard.

Section 1.9 Project Crediting Period

Via checking the UNFCCC website/^{unfccc/} (UNFCCC Ref. No.: 6957), it is confirmed that the crediting period of this project under CDM started on 06-December-2012 and expired on 05-December-2022 with 10 years fixed.

Via checking the CCER website/^{ccer/}, it is confirmed that the crediting period of this project under CDM started on 26-May-2011 and expired on 05-December-2022 with ending period no more than the CDM crediting period.

For the VCS crediting period, PP has chosen 10 years fixed crediting period started from 26-May-2011 to 25-May-2021 which is in line with the concept for crediting period in section 3.8.1 of the VCS standard 4.0.

CAR 03 was raised and successfully closed, Refer to Appendix 4 for assessment details.

Section 1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The ERs of each vintage indicated in PD are calculated based on the annual ERs in the CDM registered PDD and days included in each vintage. The average annual ERs reported is different with the annual ERs in the CDM registered PDD due to the different values of GWP_{CH4} (21 tCO₂/tCH₄ before 2013 and 25 tCO₂/tCH₄ after 2013) are took into account in this VCS PD, while the CDM PDD taking the fixed value of 21 tCO₂/tCH₄. The values have been checked and confirmed by the VVB as correct.

The average annual ERs of the project are 589,187 tCO₂e, which is higher than the threshold of large-projects (300,000 tCO₂e per year). Therefore, the project falls in the category of “Large Project” as per definition in VCS standard. The estimated total Estimated GHG Emission Reductions or Removals during the VCS crediting period (26-May-2011 to 25-May-2021) is 5,891,867 tCO₂e.

Section 1.12 Project Location

The project site is located in Panjiang Mining District, Pan County, Liupanshui City, Guizhou Province P. R. China. The geographic coordinates of the involved power stations are listed in the table below:

Coal Mine	Power Station	Longitude	Latitude
Tucheng	Tucheng 13	104.5466° E	26.0644° N
	Tucheng 14	104.5667° E	26.0593° N
Laowuji	Nanyi	104.4908° E	25.8661° N
Songhe	Cai'er	104.6421° E	25.0321° N
	Caisan	104.6404° E	25.0335° N

The location of the project site is verified as consistent with the indication in the registered CDM PDD via on-site investigation.

Section 1.13 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 CDM PDD to be the same as the baseline scenario identified in the CDM registered PDD, i.e., 1) all the low concentration CMM extracted from the coal mines 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). Therefore, the project is confirmed not to be implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction.

Section 1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The PD 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, Chinese National Coalmine Safety Regulation (valid in 2016)^{/CSR/}. For the power generation to the grid, 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. Also, the project is legally approved by Local government by checking the FSR approval^{/AFSR/}, 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.

CAR 04 was raised and successfully closed, Refer to Appendix 4 for assessment details.

Section 1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project started operation on 26-May-2011 and it was registered as a CDM project activity in UNFCCC with the Registration Ref. No. 6957 on 06-December-2012. The crediting period under CDM started on 06-December-2012 and expired on 05-December-2022. Which has been verified by checking the UNFCCC webpage

<https://cdm.unfccc.int/Projects/DB/RINA1344516913.29/view>

The project has been registered as a CCER project on 26-May-2014 (Ref. 012). The crediting period of CCER started on 26-May-2011 and expired on 05-December-2022. The GHG emission reductions of 305,485 tCO₂ generated from 26-May-2011 to 05-December-2012 by the project has been issued as CCER used for Chinese allowance trading, the period is verified as before the CDM registration time, which can be verified by checking the project dedicated China CCER website^{/ccer/}.

The project sought the registration with the VCS Program and claim GHG emission reductions as VCU for this monitoring period.

Via interview with the project owner^{/11/} and searching the other GHG scheme website, it is confirmed that the project owner is not included in any other voluntary emission trading programme besides the CDM and CCER, and the ERs generated from the project have been and will be sold only once.

Section 1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The 1,680,035 tCO₂ in monitoring period from 06-December-2012 to 25-February-2018 has been issued as CDM CERs, which can be verified by checking the project dedicated UNFCCC website.

The GHG emission reductions of 305,485 tCO₂ generated from 26-May-2011 to 05-December-2012 by the project has been issued as CCER used for Chinese allowance trading, the period is verified as before the CDM registration time, which can be verified by checking the project dedicated China CCER website^{/ccer/}.

The GHG emission reductions generated by the project from 26-February-2018 will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions. The VCUs claimed are related to a different period and therefore there is no double counting occurred.

1.16.2 Other Forms of Environmental Credit

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.

Section 1.17 Additional Information Relevant to the Project

Leakage Management

According to the applied methodology ACM0008 (Version 07)^{/ACM0008/} and the demonstration in the PDD and section 4.4.5.3 of this report, the leakage of the project is zero.

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

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

The Project is confirmed contributing to sustainable development in the following ways: 1. Achieving significant GHG emission reductions and other air pollutant reductions by methane destruction; 2. Displacing part of the grid electricity mainly generated by fossil fuel combustion, thus reducing the emission of CO₂ and other air pollutants; 3. Creating new job opportunities, which have been validated in the CDM PDD.

Further Information

It is confirmed that there is no further information that may have a bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net emission reductions or removals.

Validation Conclusion:

According to the validation report of the project for CDM registration and the above further validation of the cover page and sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.12, 1.13, 1.14, 1.15.1, 1.16, 1.17 of the VCS Project Description Template, it is validated that Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3 is in compliance with the VCS Program requirements as set out in the VCS Standard version 4.0.

3.2 Methodology Deviations

During the validation and this monitoring period, there are no methodology deviations.

3.3 Project Description Deviations

During the validation and this monitoring period, there are no project description deviations related to the significant change.

3.4 Grouped Project

Not applicable as the project is not a grouped project.

4. VERIFICATION FINDINGS

4.1 Project Implementation Status

By means of on-site inspection and documents review, the verification team can confirm the below,

The project is a Coal Mine Methane Power Generation Project, utilizes the coal mine methane (CMM) with methane concentration of 6-30% extracted from coal mines located in Pan County, Liupanshui City, Guizhou Province to generate electricity for captive use. The Project covers three coal mines with five mining areas with total methane resource of 9.8 billion m³ and extractable resources of 3.5 billion m³. No coal bed methane (CBM) or ventilation air methane (VAM) utilization is involved in the project.

In accordance with the registered PDD/^{PDD/}, there are total 38 sets of CMM power generators with the total installed capacity of 22.8MW will be installed to utilize CMM for power generation. Via onsite investigation and checking the previous verification report/^{VER/}, 34 sets of CMM power generators with total installed capacity of 20.4MW have been installed before the start of this monitoring period. Power plant Songhe cai'er started construction in the 1st monitoring period and was put into operation on 18-Jan-2014. 10 sets of CMM power generator with unit capacity of 600kW are to be installed in power plant Songhe cai'er as described in the PDD. However, during this monitoring period only six sets of CMM power generator with unit capacity of 600kW have been installed in power plant Songhe Cai'er as the CMM gas extracted from the coal mine can only meet the demand of six sets of CMM power generator. The rest of the four sets of CMM power generator will be installed in power plant Songhe Cai'er when the CMM gas stream can meet the demand of 10 sets of CMM power generator in the future/^{11/&/CHCS/}.

This verification covers the period from 26-February-2018 to 25-December-2019 (including both days³). 793,277 tCO₂e emission reductions are achieved during this monitoring period.

The commenced electricity generation date of each power plant is as below table, which has been confirmed in the daily operational log/^{LOG/} against the and previous verification report/^{VER/}.

Table 4-1 Commissioning date of each plant

Power Plant	Commissioning Date
Tucheng 13	26/07/2011
Tucheng 14	26/05/2011
Laowuji Nanyi	24/07/2013

³ Via checking the 4th CDM verification report and MR, it is confirmed that this monitoring period starts from 08:00 of 25/02/2018 as last monitoring period (MP4) ended at 08:00 of 25/02/2018. The emission reductions achieved from 08:00 to 24:00 of 25/02/2018 are claimed in this monitoring period. This monitoring period ends at 08:00 of 25/12/2019. The emission reductions achieved from 08:00 to 24:00 of 25/12/2019 will be claimed in the next monitoring period.

Songhe Cai'er	18/01/2014
Songhe Caisan	18/01/2012

The project was expected to supply electricity to the coal mines for captive use, replacing the equivalent amount of electricity that would have been purchased from the CSPG and the captive power plants. Waste heat from the generators have been recovered to provide heat to the coal mines. 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, all the included power plants run continuously^{/LOG/} except Laowuji Nanyi power plant. Via checking the operation log and interview with the Laowuji Nanyi power plant chief^{/11/}, it is verified that Laowuji Nanyi power plant was at the status of equipment halting during the whole monitoring period. Furthermore, Songhe Cai'er power plant stopped operation during the period of 02-February-2019 to 05-October-2019 and 11-October-2019 to 25-December-2019 due to the concentration of CH₄ in CMM gas was not enough for electricity generation, which has been verified by checking the operation log^{/LOG/}, interview with plan chief^{/11/} and cross checking the meter reading record^{/MRR/} with gas data^{/GMD/}.

No events or situations, which may impact the applicability of the applied methodology, occurred during this monitoring period. 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 registered PDD.

Via on-site interview with the project implementer and checking the project dedicated UNFCCC website, it is verified that the implementation of the project is consistent with the description in the Monitoring Report (MR) and Project Design Document (PDD) and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 26-February-2018 to 25-December-2019.

Details of the project location are given in table 4-2 below:

Table 4-2: Project Location

No.	Project Location
Host Country	P.R.China
Region:	Guizhou Province
Project location address:	Panjiang Mining District, Pan County, Liupanshui City

The geographic coordinates of the involved power stations are assessed in the above section of this report.

Basic technical details of the project are summarized in table 4-3 which has been verified during site visit ^{/PHT/,/TP/}.

Table 4-3: Technical data of the project activity

Parameter	Unit	Value
CMM generators		

Parameter	Unit	Value	
Type:	-	600GJZ ₁ -1PWW _D	600GF ₁ -1RW _D
Rated Power	kW	600	600
Continuous power	kW	480	480
Number of units	-	18 ⁴	20 ⁵
Rated Current	A	1,083	1,083
Rated voltage	V	400	400
Rated speed	r/min	1,000	1,000
Frequency	Hz	50	50
Lifetime	year	10	10
Manufacturer	-	Shangdong Oil Field Shengli Power Machinery Group CO. Ltd.	

Via checking the previous verification report, it is verified that there is no any previously validated methodology deviations.

In conclusion, Verification Team was able to confirm that the project implementation is in accordance with the project description contained in the registered CDM PDD.

CAR 06, CAR 07 and CAR 08 were raised and successfully closed, Refer to Appendix 4 for assessment details.

4.2 Safeguards

4.2.1 No Net Harm

In China, an Environmental Impacts Assessment is required according to Chinese legislation. The EIA was designed by Guizhou Environmental Science Research and Design Institute/^{EIA} and approved by Guizhou Province Environmental Protection Bureau on 26-December-2011/^{AEIA}. The analysis of the environmental impacts of the project activity is sufficiently described according to 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 of MR including the air pollution and wastewater, noise, solid waste and impact on the ecosystem according to the EIA report.

⁴ 14 installed and 4 planned at Songhe cai'er

⁵ All installed

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” and “Law of the People's Republic of China on the Environmental Impact Assessment”. The environmental impact assessment was completed in July 2011 by Environmental Science Research & Design Institute of Gansu Province. The EIA report ^{/EIA/}, which was approved by the Guizhou Province Environmental Protection Bureau (EPB) on 26-December-2011, was inspected by the VVB to be valid ^{/AEIA/}. Every aspect of environmental impact has been considered in the EIA report with corresponding measures during project development.

During the site inspection, the project was implemented normally. The verifier 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 as complies with the standard requirements of Category 2 (GB12348-2008).

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. There was also no any endangered species found in the project location.

As per the approval of EIA, 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 PDD, MR and EIA, also the proper measurements have been carried out by project implementer to mitigate such impacts.

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

4.2.2 Local Stakeholder Consultation

A stakeholder survey was carried out by the project developer during April 2011, which was prior to the publication of the PDD on the UNFCCC website.

A stakeholder meeting was held on 19-April-2011 in the conference room of Panjiang Coal Mine, presided over by the representative of the Project owner. Representatives of relevant personnel of Panjiang Coal Mine, local villagers and local government were invited to attend the meeting, totally 75 copies of questionnaires were issued to relevant personnel of Panjiang Coal Mine, local villagers and government officials with 70 pieces of reply received. The stakeholders' background

information and comments from questionnaires were summarized and recorded in the PDD, Section E and has been assessed during the validation process.

During the implementation stage of this monitoring period, via checking the local communication survey records/^{LCSR/} and interview with the local officer/^{12/} and local residents/^{13/} during site visit, it is confirmed that the local authority has conducted follow-up interviews and ongoing communication with local stakeholders to collect any comments or inputs to the project implementation. Based on the verification team's 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.

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 this monitoring 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.

4.3 AFOLU-Specific Safeguards

Not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

4.4.1 Assessment of Data and parameters Available at Validation

Means of verification	By means of comparison of the MR and the ER calculation with the latest approved version of the PDD the verification team has checked whether all parameters fixed ex-ante or at fixed crediting period have been applied correctly. The parameters that are fixed ex ante are following:		
	Parameters	Source of data	Values applied
	$CMM_{BL,i,y}$	Data was provided by the project owner, which has been verified and determined in the registered PDD, validation report.	0
	$PMM_{BL,i,y}$	Data was provided by the project owner, which has been verified and determined in the registered PDD, validation report.	0
	Eff_{ELEC}	Data from registered PDD, validation report, applied	99.5%

		methodology and IPCC		value is verified as consistent among the registered PDD/PDD/, the validation report/VAL/, applied methodology and IPCC/IPCC/.
	D_{CH_4}	Data from registered PDD, validation report and 2006 IPCC Guidelines for National Greenhouse Gas Inventories	0.67kg/m ³	This is an ex-ante fixed value during the crediting period, the value is consistent among the registered/PDD/, the validation report/VAL/ and 2006 IPCC Guidelines for National Greenhouse Gas Inventories /IPCC/.
	CEF_{CH_4}	Data from registered PDD, validation report and applied methodology, it is a default value	2.75 tCO ₂ e/tCH ₄	This is an ex-ante fixed value during the crediting period, the value is consistent among the registered /PDD/, the validation report/VAL/ and applied methodology/ACM0008/.
	GWP_{CH_4}	Data from EB69 Annex 3 (version 01.0) / IPCC Fourth Assessment Report: Climate Change 2007 (AR4)	25 tCO ₂ e/tCH ₄	According to COP/MOP decision: “Standard for application of the global warming potentials to CDM project activities and PoAs for the second commitment period of the Kyoto Protocol”, a value of 25 is to be applied for the second commitment period of the Kyoto Protocol.
	EF_{ELEC}	Data from registered PDD, validation report	0.6323 tCO ₂ /MWh	This is an ex-ante fixed value during the crediting period, the value is calculated as per “Tool to calculate the emission factor for an electricity system” and verified as consistent among the registered PDD/PDD/, the validation report/VAL/.
The following sources of information have been used in this context:				

		• /MR/ • /XLS/ • /PDD/ • /PS/ • /VAL/ • /VVS/ • /IPCC/ • /unfccc/
Findings	☐	The MR and the ER calculation have considered the parameters fixed ex-ante correctly, no deviations have been observed.
	☒	The following deviations from the parameters fixed ex-ante have been identified in the course of this verification: - N/A
	☒	In this context the following CARs, CLs, FARs have been raised: - CAR 09
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The parameter fixed ex ante has been indicated in the registered PDD. And the MR is checked as in line with the PDD.

4.4.2 Assessment of Data and parameters Monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) 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).	
Findings	Refer to CAR 06	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

4.4.3 Assessment of in Compliance with monitoring plan

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) 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.
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		Methane sent to the power generators MM_{ELEC} and Concentration PC_{CH_4} are measured continuously by the Flow meters (with temperature and pressure transmitter) and gas analysers. Flow meters (with temperature and pressure transmitter) and gas analysers are installed at each CMM power plant. MM_{ELEC} is continuously measured and hourly recorded by DCS system automatically. The Flow meters (with temperature and pressure transmitter) and gas analysers monitors the Methane sent to the power generators. And the calculation is done by the DCS system automatically. Electricity generation by the project GEN_y and electricity consumption for the project activity $CONS_{ELEC,PJ}$ is continuously monitored by electric meters installed at each CMM power plant. PC_{NMHC} is measured annually, the value is monitored by the laboratory CEF_{NMHC} is carbon emission factor for combusted non-methane hydrocarbons (various). If the concentration of NMHC PC_{NMHC} in the extracted gas is less than 1%, emission from NMHC destruction will be considered to be zero in the emission calculation according to ACM0008 (Version 07). The following sources of information have been used in this context: • /MR/ • /ACM0008/ • /unfccc/ • /PPA/ • /CAL/
Findings	☒	The monitoring implementation is completely in accordance with the approved methodology applied by the project and monitoring plan in the registered PDD
	☐	In this context the following CARs, CLs, FARs have been raised: - N/A
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The monitoring system complies with the applied methodology and the monitoring plan and all applied procedures are completely in compliance to the methodology ACM0008 (Version 07). The monitoring system and all applied procedures are completely in compliance to the registered PDD.

4.4.4 Compliance with the calibration frequency requirements for measuring instruments

Means of verification	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 registered PDD 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). The following sources of information have been used in this context: • /MR/
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		• /XLS/ • /CAL/
Findings	☒	Based on the details listed in Appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.
	☐	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to Appendix 6
	☒	In this context the following CARs, CLs, FARs have been raised:
		- CAR 10
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan and relevant national rules. The calibrations of all monitoring equipment installed have been verified as listed in table given in Appendix 6 to this report. Based on that the DOE can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.

4.4.5 Assessment of data and calculation of emission reductions or net removals

4.4.5.1 Calculation of baseline GHG emissions or removals

Means of verification	During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified: • <i>Transparency:</i> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency:</i> 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. • <i>Correctness:</i> It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • <i>Completeness:</i> It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/
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	• /XLS/ Baseline Emissions Calculation Assessment: The formula used for the determination of baseline emissions is consistent with the latest approved PDD and methodology: $BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$ Where: BE_y Baseline emissions in year y (tCO₂e) $BE_{MD,y}$ Baseline emissions from destruction of methane in the baseline scenario in year y (tCO₂e) $BE_{MR,y}$ Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO₂e) $BE_{Use,y}$ Baseline emissions from the production of power replaced by the project activity in year y (tCO₂e). a) $BE_{MD,y}$ Via checking the PDD, it is confirmed that the baseline scenario does not involve any flaring or usage of CMM, 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 PDD and methodology, $BE_{MR,y} = GWP_{CH_4} \times [(CMM_{PJ,y} - CMM_{BLi,y}) + (PMM_{PJ,y} - PMM_{BLi,y})]$ Where: $CMM_{PJ,y}$ Pre-mining CMM captured, sent to and destroyed by power generation in the project activity in year y (expressed in tCH₄); not distinguishable from $PMM_{PJ,y}$ $CMM_{BLi,y}$ Pre-mining CMM that would have been captured, sent to and destroyed by use i in the baseline scenario in year y (expressed in tCH₄) $PMM_{PJ,y}$ Post-mining CMM captured, sent to and destroyed by power generation in the project activity in year y (tCH₄); not distinguishable from $CMM_{PJ,y}$ $PMM_{BLi,y}$ Post-mining CMM that would have been captured, sent to and destroyed by use i in the baseline scenario in year y (tCH₄) GWP_{CH_4} Global warming potential of methane (25 tCO₂e/tCH₄) According to the PDD, it is confirmed that in the baseline scenario, there is no CMM captured, sent to and destroyed, thus $CMM_{BLi,y}$ and $PMM_{BLi,y}$ is 0; $CMM_{PJ,y}$ and $PMM_{PJ,y}$ are together directly monitored and measured, which is the same as MM_{ELEC}, given that the common extraction system is located in the underground mine. Hence, $BE_{MR,y} = GWP_{CH_4} \times (CMM_{PJ,y} + PMM_{PJ,y})$ $= GWP_{CH_4} \times MM_{ELEC}$ For period from 26-February-2018 to 31-December-2018 $BE_{MR,y} = 25 \text{ tCO}_2\text{e/tCH}_4 \times 16,440.16 \text{ tCH}_4$ $= 411,004 \text{ tCO}_2\text{e}$ For period from 01-January-2019 to 25-December-2019 $BE_{MR,y} = 25 \text{ tCO}_2\text{e/tCH}_4 \times 15,661.59 \text{ tCH}_4$ $= 391,539 \text{ tCO}_2\text{e}$ Thus the total value of $BE_{MR,y}$ during this monitoring period is 802,543 tCO₂e c) $BE_{Use,y}$ According to the PDD and methodology $BE_{Use,y} = (GEN_y - CONS_{ELEC,PJ}) \times EF_{ELEC} + HEAT_y \times EF_{HEAT} + VFUEL_y \times EF_v$
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	Where: GEN_y Electricity generated by project activity in year y (MWh) $CONS_{ELEC,PJ}$ Additional electricity consumption for capture and use or destruction of methane, i any (MWh) EF_{ELEC} Emissions factor of electricity replaced by project (tCO₂/MWh) $HEAT_y$ Heat generation by project activity in year y (GJ), including through the use of CBM EF_{HEAT} Emissions factor for heat production replaced by project activity (tCO₂/GJ) $VFUEL_y$ Vehicle fuel provided by the project activity in year y (GJ) EF_v Emissions factor for vehicle operation replaced by project activity (tCO₂/GJ) According to the PDD and via on-site investigation, it is confirmed that the project does generate heat and provide vehicle fuel, hence $BE_{Use,y} = (GEN_y - CONS_{ELEC,PJ}) \times EF_{ELEC}$ For period from 26-February-2018 to 31-December-2018 $BE_{Use,y} = (67,499.688 \text{ MWh} - 68.736 \text{ MWh}) \times 0.6323 \text{ tCO}_2/\text{MWh}$ = 42,636 tCO₂e For period from 01-January-2019 to 25-December-2019 $BE_{Use,y} = (63,285.216 \text{ MWh} - 99.528 \text{ MWh}) \times 0.6323 \text{ tCO}_2/\text{MWh}$ = 39,952 tCO₂e Thus the total value of $BE_{Use,y}$ during this monitoring period is 82,588 tCO₂e Hence, for period from 26-February-2018 to 31-December-2018 $BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$ = 0 + 411,004 tCO₂e + 42,636 tCO₂e = 453,640 tCO₂e for period from 01-January-2019 to 25-December-2019 $BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$ = 0 + 391,539 tCO₂e + 39,952 tCO₂e = 431,491 tCO₂e While, during this monitoring period, $BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$ = 0 + 802,543 tCO₂e + 82,588 tCO₂e = 885,131 tCO₂e
Findings	☐ The calculation of the baseline emissions was found to be fully compliant with the above stated principles. The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified. ☒ The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.

Conclusion	☒	In this context the following CARs, CLs, FARs have been raised:
		- Refer to CAR 06
	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.		

4.4.5.2 Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: - Transparency: It has been checked whether the calculation of project emissions 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 project emissions are in accordance with the monitoring plan and the approved methodology. - Completeness: It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: /MR/ /XLS/ Project Emission Calculation Assessment: The formula used for the determination of project emissions is consistent with the latest approved PDD and methodology: $PE_y = PE_{ME} + PE_{MD} + PE_{UM}$ Where: PE_y Project emissions in year y (tCO₂e) PE_{ME} Project emissions from energy use to capture and use methane (tCO₂e) PE_{MD} Project emissions from methane destroyed (tCO₂e) PE_{UM} Project emissions from un-combusted methane (tCO₂e) a) PE_{ME} According to the PDD, it is confirmed that there is no additional energy required for CMM capture compared with the baseline scenario, this is also verified via the on-site investigation. Hence, $PE_{ME}=0$. b) PE_{MD} According to the PDD and methodology, it is confirmed that the project emission generated when the captured methane is utilized or oxidized.
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	In addition, if NMHC account for more than 1% by volume of the extracted CMM, combustion emission from these gases should also be included. $PE_{MD} = (MD_{FL} + MD_{OX} + MD_{ELEC} + MD_{HEAT} + MD_{GAS}) \times (CEF_{CH_4} + r \times CEF_{NMHC})$ And $r = PC_{NMHC} / PC_{CH_4}$ Where: MD_{FL} Methane destroyed through flaring (tCH₄) MD_{OX} Methane destroyed through flameless oxidation (tCH₄) MD_{ELEC} Methane destroyed through power generation (tCH₄) MD_{HEAT} Methane destroyed through heat generation (tCH₄) MD_{GAS} Methane destroyed after being supplied to gas grid or for vehicle use (tCH₄) CEF_{CH_4} Carbon emission factor for combusted methane (2.75 tCO₂/tCH₄) r Relative proportion of NMHC compared to methane CEF_{NMHC} Carbon emission factor for combusted non methane hydrocarbons (the concentration varies and, therefore, to be obtained through periodical analysis of captured methane) (tCO₂/tNMHC) PC_{CH_4} Concentration (in mass) of methane in extracted gas (%), measured on wet basis PC_{NMHC} NMHC concentration (in mass) in extracted gas (%) According to the PDD and via on-site investigation/^{PHT/}, it is confirmed that the Project doesn't involve flaring, flameless oxidation, heating and supplying to gas grid, thus MD_{FL}, MD_{OX}, MD_{HEAT} and MD_{GAS} is 0. While via checking the annual gas composition analysis report of the extracted gas dated 05/01/2018, 09/06/2018 and 22/02/2019/^{REG/}, it is confirmed that the concentration of NMHC accounts for less than 1% by volume of extracted coal mine gas, thus emission from NMHC destruction is not considered. Therefore, $PE_{MD} = MD_{ELEC} \times CEF_{CH_4}$ Where $MD_{ELEC} = MM_{ELEC} \times Eff_{ELEC}$ MM_{ELEC} Methane measured sent to power plant (tCH₄) Eff_{ELEC} Efficiency of methane destruction/oxidation in power plant (taken as 99.5% from (IPCC)) Thus $PE_{MD} = MM_{ELEC} \times Eff_{ELEC} \times CEF_{CH_4}$ For period from 26-February-2018 to 31-December-2018 $PE_{MD} = 16,440.16 \text{ tCH}_4 \times 99.5\% \times 2.75 \text{ tCO}_2/\text{tCH}_4$ $= 44,985 \text{ tCO}_2\text{e}$ For period from 01-January-2019 to 25-December-2019 $PE_{MD} = 15,661.59 \text{ tCH}_4 \times 99.5\% \times 2.75 \text{ tCO}_2/\text{tCH}_4$ $= 42,855 \text{ tCO}_2\text{e}$ Thus, the total value of PE_{MD} during this monitoring period is 87,840 tCO₂e c) PE_{UM} According to the PDD 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, $PE_{UM} = GWP_{CH_4} \times MM_{ELEC} \times (1 - Eff_{ELEC}) + PE_{flare} + PE_{OX} \times GWP_{CH_4}$ Where
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	GWP_{CH_4} Global warming potential of methane (25 tCO₂e/tCH₄) MM_{ELEC} Methane measured sent to power plant (tCH₄) Eff_{ELEC} Efficiency of methane destruction/oxidation in power plant (taken as 99.5% from (IPCC)) PE_{flare} Project emissions of non-combusted CH₄ expressed in terms of CO₂e from flaring of the residual gas stream (tCO₂e) PE_{OX} Project emissions of non-oxidized CH₄ from flameless oxidation of the VAM stream (tCH₄) As per the PDD, $PE_{flare}=0$ and $PE_{OX}=0$. Thus, $PE_{UM} = GWP_{CH_4} \times MM_{ELEC} \times (1 - Eff_{ELEC})$ For period from 26-February-2018 to 31-December-2018 $PE_{UM} = 25 \text{ tCO}_2\text{e/tCH}_4 \times 16,440.16 \text{ tCH}_4 \times (1 - 99.5\%)$ $= 2,056 \text{ tCO}_2\text{e}$ For period from 01-January-2019 to 25-December-2019 $PE_{UM} = 25 \text{ tCO}_2\text{e/tCH}_4 \times 15,661.59 \text{ tCH}_4 \times (1 - 99.5\%)$ $= 1,958 \text{ tCO}_2\text{e}$ Thus, the total value of PE_{UM} during this monitoring period is 4,014 tCO₂e Hence, for period from 26-February-2018 to 31-December-2018 $PE_y = PE_{ME} + PE_{MD} + PE_{UM}$ $= 0 \text{ tCO}_2\text{e} + 44,985 \text{ tCO}_2\text{e} + 2,056 \text{ tCO}_2\text{e}$ $= 47,041 \text{ tCO}_2\text{e}$ for period from 01-January-2019 to 25-December-2019 $PE_y = PE_{ME} + PE_{MD} + PE_{UM}$ $= 0 + 42,855 \text{ tCO}_2\text{e} + 1,958 \text{ tCO}_2\text{e}$ $= 44,813 \text{ tCO}_2\text{e}$ While, during this monitoring period, $PE_y = PE_{ME} + PE_{MD} + PE_{UM}$ $= 0 \text{ tCO}_2\text{e} + 87,840 \text{ tCO}_2\text{e} + 4,014 \text{ tCO}_2\text{e}$ $= 91,854 \text{ tCO}_2\text{e}$
Findings	☐ The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified. ☒ The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches. ☒ In this context the following CARs, CLs, FARs have been raised: - Refer to CAR 06

Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	It can be confirmed that the project calculation is overall correct.	

4.4.5.3 Calculation of leakage GHG emissions

Means of verification	During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. The following sources of information have been used in this context: • /MR/ • /XLS/ Leakage Emission: In accordance with the PDD and methodology, the leakage is calculated as below, $LE_y = LE_{d,y} + LE_{o,y}$ Where LE_y Leakage emissions in year y (tCO₂e); $LE_{d,y}$ Leakage emissions due to displacement of other baseline thermal energy uses of methane in year y (tCO₂e); $LE_{o,y}$ Leakage emissions due to other uncertainties in year y (tCO₂e). Since the baseline scenario does not include thermal energy use, hence $LE_{d,y} = 0$ $LE_y = LE_{o,y}$ According to the PDD and methodology, The leakage of the proposed project activity will not result from: • Impact of CDM project activity on coal production – the CDM project activity is not designed to affect the on-going coal production, with the gas extraction and ventilation systems as part of the baseline scenario, and therefore leakage from this is zero; • Impact of CDM project activity on coal prices and market dynamics – according to the methodology ACM0008 (Version 07), the proposed project is considered having no impact on coal price and market dynamics ex-ante, unless the EB instruct otherwise in future. Therefore, during this monitoring period, $LE_y = 0$.	
Findings	☒	No leakage emissions were to be considered ($LE = 0$).
	☐	The calculation of the leakage emissions was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.

		No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the leakage emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised: - N/A
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	It can be confirmed that the no leakage emissions were 0 ($LE_y = 0$).	

4.4.5.4 Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately																	
	- Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions.																	
	It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.																	
	Summary of emission reductions during the monitoring period:																	
	$ER_y = BE_y - PE_y - LE_y$ $= BE_y - PE_y$																	
	Where:																	
	ER_y -Emission reductions (t CO ₂ e) BE_y -Baseline Emissions (t CO ₂ e) PE_y -Project Emissions (t CO ₂ e) LE_y -Leakage Emissions (t CO ₂ e)																	
	Based on the above calculation of BE_y and PE_y ,																	
	During this monitoring period, the emission reduction is calculated as below table																	
	<table border="1"> <thead> <tr> <th>Parameters</th><th>Baseline Emissions BE_y</th><th>Project Emissions PE_y</th><th>Leakage Emissions LE_y</th><th>Emission Reductions ER_y</th></tr> <tr> <th>Period</th><th>(tCO₂e)</th><th>(tCO₂e)</th><th>(tCO₂e)</th><th>(tCO₂e)</th></tr> </thead> <tbody> <tr> <td>26-February-2018~31-December-2018</td><td>453,640</td><td>47,041</td><td>0</td><td>406,599</td></tr> </tbody> </table>				Parameters	Baseline Emissions BE_y	Project Emissions PE_y	Leakage Emissions LE_y	Emission Reductions ER_y	Period	(tCO ₂ e)	(tCO ₂ e)	(tCO ₂ e)	(tCO ₂ e)	26-February-2018~31-December-2018	453,640	47,041	0
Parameters	Baseline Emissions BE_y	Project Emissions PE_y	Leakage Emissions LE_y	Emission Reductions ER_y														
Period	(tCO ₂ e)	(tCO ₂ e)	(tCO ₂ e)	(tCO ₂ e)														
26-February-2018~31-December-2018	453,640	47,041	0	406,599														

	01- January- 2019~ 25- December- 2019	431,491	44,813	0	386,678	
	Total	885,131	91,854	0	793,277	
	To re-produce the emission reductions, following documents/records were verified by the audit team:					
	- Monthly meter readings of M1~M5, M1a, M1b /MRR/ - Monthly sales receipts based on the meters M1~M5, M1a, M1b /EBS/ - Monthly electricity balance sheet issued by project owner/EBS/ - Monthly gas flow readings via flow meters, pressure transmitters and temperature transmitters of F1~F4 and F2', F4', F5'/GMD/ - Monthly gas report/GMD/ - Monthly methane concentration readings via gas analyzer meters of C1~C5/GMD/					
	Meters calibration records of all the meters (covering the monitoring period)/CAL/					
	All the figures as per the monitoring report were cross-checked by the verification team against basic monitored data.					
	No malfunction of all the meters was detected during the monitoring period.					
	Findings	☒	Section 5.4 of the MR includes in a summary table of the emission reductions calculation.			
		☒	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.			
		☐	The values as specified in the ER summary table are correct; no issues have been identified during the verification, which requires changes in the ER calculation.			
☒		During the verification issues with impact on the ER calculation have been identified.				
☒		In this context the following CARs, CLs, FARs have been raised: - Refer to CAR 06				
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.				
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.				
It can be confirmed that the emission reductions calculation is overall correct.						

4.4.5.5 Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.
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Findings	☐	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	☒	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☐	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	☐	In this context the following CARs, CLs, FARs have been raised: - N/A
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the latest approved PDD. It is confirmed that the ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.

4.4.5.6 Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (4.4.5.5 of this report), the verification team has checked whether (in case 3) an appropriate explanation is included in the MR. During this monitoring period, the actual emission reduction of 793,277 tCO₂e was found 28.33% lower than the estimated emission reduction of 1,106,827 tCO₂e (=604,778 tCO₂e *668day/365day) in the registered PD/PD/. Furthermore, it is confirmed that to be conservative, since only 6 sets of CMM generators have been installed at power plant Songhe Cai'er, instead of 10 sets, the estimated emission reductions for this monitoring period exclude the emission reduction of 4 sets was calculated. The current installed capacity is 20.4MW, and the designed total installed capacity is 22.8MW (including 10 sets), based on the PD, the value of estimated emission reductions for this monitoring period exclude the emission reduction of 4 sets is calculated as 990,319 tCO₂e (=1,106,827 tCO₂e ×20.4 MW/22.8 MW). Hence, it is confirmed that the actual emission reductions achieved during this monitoring period is 19.90% ((793,277 tCO₂e -990,319 tCO₂e)/ 990,319 tCO₂e) lower than the estimated emission reductions excluding 4 sets for this monitoring period. Furthermore, due to Laowuji Nanyi power plant was at the status of equipment halting during the whole monitoring period. Furthermore, Songhe Cai'er power plant stopped operation during the period of 02-February-2019 to 05-October-2019 and 11-October-2019 to 25-December-2019 due to the concentration of CH₄ in CMM gas was not enough for electricity generation, by considering these factors, the estimated emission reductions achieved in this monitoring period are calculated as 789,569 tCO₂e which has been listed in the MR and verified as correct by verification team. Hence it is confirmed that the actual emission reductions achieved in this monitoring period is 0.47% ((793,277 tCO₂e-789,569 tCO₂e)/ 789,569 tCO₂e) more than the estimated emission reductions.
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	Thus, it is confirmed that the ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.	
Findings	☒	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	☐	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	☒	In this context the following CARs, CLs, FARs have been raised: - CL 02, CAR 06
	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
Conclusion	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	It is confirmed that the ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.	

4.5 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-check 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 registered PDD and national regulation.

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.

Refer to Appendix 5 for the detail assessment.

4.6 Non-Permanence Risk Analysis

N/A

5. VERIFICATION CONCLUSION

Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Verified Carbon Standard (VCS) gap validation and 1st periodic verification of the project activity Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3, CDM Registration Ref. No. 6957 and VCS reference No. 2292, for the period 26-February-2018 to 25-December-2019, with regard to the relevant requirements for VCS version 4.0.

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

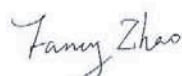
- the project has been implemented and operated as per the registered CDM PDD and VCS PD;
- the project complies with the validation criteria for projects set out in VCS Version 4.0;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS requirement;
- the monitoring is in place as per the applied baseline and monitoring methodology;
- the monitoring complies with the monitoring plan in the CDM PDD;
- the monitoring plan in the CDM PDD is as per the applied baseline and monitoring methodology.

Verification period: From 26-February-2018 to 25-December-2019

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

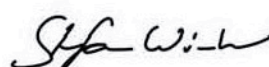
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
26-February-2018~31-December-2018	453,640	47,041	0	406,599
01-January-2019~25-December-2019	431,491	44,813	0	386,678
Total	885,131	91,854	0	793,277

Beijing, 25-August-2020



Zhao Xuejiao
TÜV NORD JI/CDM Certification Program
Verification Team Leader

Essen, 25-August-2020



Stefan Winter
TÜV NORD JI/CDM Certification Program
Final Approval

APPENDIX 1: ABBREVIATIONS

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CBM	Coal Bed Methane
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
CQCCRI	China Coal Technology Engineering Group Chongqing Research Institute
CSPG	China Southern Power Grid
DCS	Distributed Control System
DverR	Draft Verification Report
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
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
Appointing and authorization according to the procedures of the TUV NORD JICOM 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 minerals production
13.1	Solid waste and wastewater
13.2	Manure

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

230_S01-V4085-F20-2020-06-20_wv11



Statement of Competence
Appointing and authorization according to the procedures of the TUV NORD JICOM Certification Program

Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2021-10-20
VCS / ISO 14064-2	Senior Assessor	2021-10-20
	Technical Reviewer	2021-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-19

251_S01-V4085-F20-2018-10-19_wv7.doc



Statement of Competence
Appointing and authorization according to the procedures of the TUV NORD JICOM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2022-07-01
JH	Senior Assessor	2022-07-01
VCS / ISO 14064-2	Senior Assessor	2022-07-01

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
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry
13.1	Solid waste and wastewater

003 - Rev. 11, Date: 2019-08-09

003_S01-V4085-F20-2019-08-09_wv11

APPENDIX 3: DOCUMENTS REVIEWED OR REFERENCED

No	Author	Title	References to the document	Provider
1.	Guizhou Provincial Environmental Protection Department	EIA approval/AEIA/	EIA approval of Guizhou Panjiang CMM Power Generation Project Phase 3, dated 26/12/2011	Project Owner
2.	Development and Reform Commission of Pan County	FSR approval/AFSR/	FSR approval of Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3, dated 03/08/2011	Project Owner
3.	Panjiang County Industrial and Commercial Bureau	Business License/BL/	Business License of Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Project Owner
4.	Testing centre of Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Calibration certificates/CAL/	Calibration Certificates for meters M1~M5 and M1a+M1b covering monitoring period (26/02/2018-25/12/2019)	Project Owner
	Chongqing Testing Centre of Science & Technology		Calibration Certificates for gas flow meters, pressure transmitter and temperature transmitter F1~F5 and F2', F4', F5' covering monitoring period (26/02/2018-25/12/2019)	Project Owner
	National Station of Mining Safety Metrology		Calibration Certificates for gas analyzer C1~C5 covering monitoring period (26/02/2018-25/12/2019)	Project Owner
5.	China National Accreditation Service for Conformity Assessment	Certificate of Metrological Authorization/CMA/	Certificate of metrological authorization to Chongqing Testing Center of Science & Technology, No. CNAS L1074 valid from 25/06/2011 to 24/08/2017, No. CNAS L1074 valid from 18/08/2017 to 17/08/2023	Project Owner
	Liupanshui Quality Technology Supervision Bureau		Certificate of Metrological Authorization to Guizhou Panjiang CBM Development & Utilization Co., Ltd., valid from 25/11/2013 to 24/11/2017, [2009]Qianliuliangbiao200905 and valid from 25/11/2017 to	

No	Author	Title	References to the document	Provider
	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China		24/11/2021, [2015]Qianliuliangbiao200905	
	China National Accreditation Service for Conformity Assessment		Certificate of Metrological Authorization to National Station of Mining Safety Metrology, No. Faji(2012)00012 valid from 31/08/2012 to 30/08/2017, and Guoliangbiao(1991)041 valid from 10/08/2017 to 09/11/2021	
			Certificate of Metrological Authorization to Laboratory of Coal Mine Exploration of Guizhou Province, No. 2013240102T, valid from 22/04/2013 to 21/04/2016 and No. 162417340256, valid from 21/04/2016 to 20/04/2022	
6.	Guizhou Panjiang Coal Mine Co., Ltd.	CH ₄ concentration statement/CHCS/	CH ₄ Quantities statement of Songhe Cai'er mining areas	Project Owner
7.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Electricity Balance Sheet/EBS/	Electricity Balance Sheet (Electricity transaction notes) covering the monitoring period - Monthly sale receipts covering this monitoring period via the meter M1~M5 and M1a+M1b - Monthly electricity balance sheets issued by project owner covering this monitoring period	Project Owner
8.	Guizhou Environmental Science Research and Design Institute:	Environmental Impact Assessment/EIA/	EIA designed by Guizhou Environmental Science Research and Design Institute on 06/07/2011	Project Owner
9.	Guizhou Coal Mine Design and Research Institute	Feasibility Study Report /FSR/	Feasibility Study Report of Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3, dated in Jan 2011	Project Owner
10.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Gas Monthly Data/GMD/	Gas Monthly Data covering the this monitoring period - Monthly gas flow reports via flow meters, pressure transmitters and temperature transmitters of F1~F5 and F2', F4', F5' - Monthly methane concentration readings via gas analyzer meters of C1~C5	Project Owner
11.	Guizhou Panjiang CBM Development &	LOG/LOG/	- Sample copy of project operation records - Equipment daily check log	Project Owner

No	Author	Title	References to the document	Provider
	Utilization Co., Ltd.		Equipment mandatory maintenance records	
12.	Project Owner and local authority	Local communication survey records/ ^{LCSR/}	Local communication survey records during this monitoring period	Project Owner
13.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Monitoring Manual/ ^{MM/}	Monitoring Manual for the project activity and CDM project site management rules and regulations for each CMM power plant involved	Project Owner
14.	Climate Bridge Ltd.	Monitoring Report/ ^{MR/}	Monitoring Report of Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3 - Draft Version 1.0, dated 20-March-2020 - Version 2.0, dated 10-July-2020 - Final Version 3.0, dated 17-August-2020 after TR	Climate Bridge Ltd.
15.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Meter Reading Records/ ^{MRR/}	Monthly Meter reading records of all the meters	Project Owner
16.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Project Operation and Maintenance Records/ ^{O&M/}	Project Operation and Maintenance Records and Regulations of each 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
17.	Climate Bridge Ltd.	Project Description/ ^{PD/}	Project Description of Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3 - Draft Version 1.0, dated 01-March-2020 - Version 2.0, dated 10-July-2020 - Final Version 3.0, dated 17-August-2020 after TR	Climate Bridge Ltd.
18.	Guizhou Panjiang CBM Development & Utilization Co., Ltd. and Guizhou	Power Purchase and Sale Contract/ ^{PPA/}	Power Purchase and Sale Contract signed by both parties for year 2018 to 2020	Project Owner

No	Author	Title	References to the document	Provider
	Panjiang Coal Mine Co., Ltd.			
19.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Gas and Power Wiring Diagram/ ^{PWD/}	Gas and Power Wiring Diagram of each CMM power plant derived from the DCS system of each CMM power plant	Project Owner
20.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	QA/QC procedures/ ^{QA/}	QA/QC procedures of implementation of the project, including the emergency response procedure	Project Owner
21.	Guizhou Panjiang CBM Development & Utilization Co., Ltd. Project Department	Report of acceptance of completed project/ ^{RACP/}	Report of acceptance of completed project of each CMM power plant	Project Owner
22.	Guizhou Panjiang CBM Development & Utilization Co., Ltd.	Training and Competence Records/ ^{TCR/}	Project Responsibilities, Training and Competence Records • Project Organization Chart and responsibilities • Staff Training Records of each CMM power plant • Operator Certificates of each CMM power plant • Internal audit record covering this monitoring period	Project Owner
23.	Shangdong Oil Field Shengli Power Machinery Group Co. Ltd.	Technical Particulars of equipment/ ^{TP/}	Technical Particulars and purchase agreement of Gas Engine Generator	Project Owner
24.	Laboratory of Coal Mine Exploration of Guizhou Province	Composition analysis report of the extracted gas/ ^{REG/}	Composition analysis report of the extracted gas for determine the PC_{NMHC} dated 05/01/2018, 09/06/2018 and 22/02/2019 covering this monitoring period	Project Owner
25.	Climate Bridge Ltd.	Emission Reduction Calculation Sheets/ ^{XLS/}	Emission Reduction Calculation sheets (related to MR) • Version 1.0, dated 20-March-2020 Emission Reduction Calculation sheets (related to PD) • Version 1.0, dated 20-March-2020 • Version 2.0, dated 17-August-2020 after TR	Climate Bridge Ltd.
26.	UNFCCC	Applied methodology/ ^{ACM0008 /}	Approved methodology ACM0008: "Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or	UNFCCC Website

No	Author	Title	References to the document	Provider
			motive) and heat and/or destruction through flaring or flameless oxidation" (Version 07)	
27.	TÜV NORD JI / CDM Certification Program	CP Manual/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	TÜV NORD JI / CDM Certification Program
28.	State Administration of Work Safety	Coalmine Safety Regulation/CSR/	Chinese National Coalmine Safety Regulation (valid in 2016)	
29.	National Standard	Flow Meter calibration standards/FMCS/	Verification regulation of different pressure type flow meter (JJG640-2016)	National Standard Website http://gb-china.cn/
30.	National Standard	Gas Analyzer calibration standards/GACS/	Verification regulation of catalysis combustion type methane measuring device (AQ6211-2008)	National Standard Website http://gb-china.cn/
31.	China DNA	Host Country Approval/HCA/	Host Country Approval issued on 15-May-2012	UNFCCC
32.	Intergovernmental Panel on Climate Change	IPCC Guidelines/IPCC/	1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp
33.	National Standard	Power metering device calibration standards/JJG/	Power metering device calibration standards (SD109-83) and verification regulation of electric watt-hour meters (JJG596-2012)	National Standard Website http://gb-china.cn/
34.	UNFCCC	Kyoto Protocol/KP/	Kyoto Protocol (1997)	UNFCCC
35.	UK's DNA	Letter of Approval/LOA/	Letter of Approval issued by UK DNA on 13/07/2012	UNFCCC
36.	UNFCCC	Marrakesh – Accords/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	UNFCCC
37.	VERRA	Monitoring Report Template/MRF/	VCS-Monitoring-Report-Template-v4.0	VERRA
38.	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/
39.	Climate Bridge Ltd.	CDM Project Design Document/PDD/	Latest Approved CDM Project Design Document for project: "Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3" version 05, dated 08/11/2012	UNFCCC website

No	Author	Title	References to the document	Provider
40.	VERRA	Project Description Template/ ^{PDT/}	VCS-Project-Description-Template-v4.0	VERRA
41.	On-site Verification Team	Photographs of Project Site/ ^{PHT/}	Photographs of each CMM power plant site, Central Control Room, DCS System, all the meters and nameplate of the equipment taken by Verification team during the on-site verification	On-site Verification Team
42.	UNFCCC	Project Standard/ ^{PS/}	CDM Project Standard for project activity (Version 02.0)	UNFCCC
43.	VERRA	Registration and Issuance Process version 4.0/ ^{RIP/}	Registration and Issuance Process version 4.0	VERRA
44.	RINA	Validation Report/ ^{VAL/}	Validation Report for CDM project “Guizhou Panjiang Low Concentration Coal Mine Methane Power Generation Project Phase 3” version 2.0, dated 30/11/2011	UNFCCC
45.	VERRA	VCS Program Definitions/ ^{VCSPD/}	VCS Program Definitions, v4.0	VCS website
46.	VERRA	VCS Program Guide/ ^{VCSPG/}	VCS Program Guide, v4.0	VCS website
47.	VERRA	VCS Standard / ^{VCSS/}	VCS Standard, v4.0	VCS website
48.	DOEs	Verification Reports/ ^{VER/}	1 st to 4 th CDM periodic verifications: MRs and Verification Reports Refer to https://cdm.unfccc.int/Projects/DB/RINA1344516913.29/view	UNFCCC
49.	UNFCCC	Validation and Verification Standard/ ^{VVS/}	CDM Validation and Verification Standard for project activities (Version 02.0)	UNFCCC
50.	China CER Exchange Info-platform	China CER	http://cdm.ccchina.org.cn/ccer.aspx	Website
51.	China DNA	DNA of China/ ^{dna/}	http://www.mee.gov.cn/	Website
52.	Google	Google Earth Map/ ^{gem/}	earth.google.com	Website
53.	IPCC	IPCC publications/ ^{ipcc/}	www.ipcc-nggip.iges.or.jp	Website
54.	Ministry of Environmental Protection of China	Environmental Protection / ^{mep/}	http://www.zhb.gov.cn/	Website
55.	UNFCCC	UNFCCC/ ^{unfccc/}	http://cdm.unfccc.int	Website
56.	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 (1st round)					Date:
Documentation provided by project participant (1st round)					
☐	Changes in the PDD	Section(s):	New version No.:		
☐	Changes in MR	Section(s):	New version No.:		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☐	Other:				
DOE assessment (1st round)					Date:
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☐ The finding is closed			

Table 2. CL from this verification

CL ID	01	Section no.	2.1	Date:	15/06/2020
Description of CL					
1. The socio-economic impact is not clarified as per the MR Template request in section 2.1 of the MR. 2. The actual environmental and socio-economic supervision during this monitoring period is not clarified.					
Project participant response (1st round)					
1. The socio-economic impact is supplemented in section 2.1 of the MR. 2. The actual environmental and socio-economic supervision during this monitoring period is supplemented.					
Documentation provided by project participant (1st round)					Date:
					03/07/2020
☐	Changes in the PD	Section(s):	New version No.:		
☒	Changes in the MR	Section(s): 2.1	New version No.: 2.0		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☒	Other:	/AEIA/			
DOE assessment (1st round)					Date:
					04/07/2020
1. The revised MR is checked, it is confirmed that the socio-economic impact is added, and 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. 2. 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.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CL ID	02	Section no.	5.4	Date: 15/06/2020
Description of CL				
It is observed that during this monitoring period, Laowuji Nanyi was not operational and Songhe Cai'er power plant stopped operation during some periods, hence the impact to the estimation of the ER shall be considered when comparing with the actual ER achieved during this monitoring period.				
Project participant response (1st round)				
The estimation of the ER in the revised MR was taking the impact of the equipments halting of Laowuji Nanyi and Songhe Cai'er power plants into consideration. Taking the stopped operation of Laowuji Nanyi and Songhe Cai'er power plants into consideration, the estimated emission reductions achieved in this monitoring period are 789,569 tCO ₂ e ⁶ , thus, the actual emission reductions achieved in this monitoring period is 0.35% ⁷ more than the estimated emission reductions, which is in the normal fluctuation range.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☐	Changes in the PD	Section(s):	New version No.:	
☒	Changes in the MR	Section(s): 5.4	New version No.: 2.0	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment (1st round)				Date: 04/07/2020
The revised MR is checked, it is confirmed that the related analysis has been added into the MR. Due to Laowuji Nanyi power plant was at the status of equipment halting during the whole monitoring period. Furthermore, Songhe Cai'er power plant stopped operation during the period of 02-February-2019 to 05-October-2019 and 11-October-2019 to 25-December-2019 due to the concentration of CH ₄ in CMM gas was not enough for electricity generation, by considering these factors, the estimated emission reductions achieved in this monitoring period are calculated as 789,569 tCO ₂ e which has been listed in the MR and verified as correct by verification team. Hence it is confirmed that the actual emission reductions achieved in this monitoring period is 0.47% ((793,277 tCO ₂ e-789,569 tCO ₂ e)/ 789,569 tCO ₂ e) more than the estimated emission reductions. Thus, it is confirmed that the ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.				
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.	1.2	Date: 15/06/2020
Description of CAR				

⁶ In this monitoring period, the power plants of Tucheng 13 (4.8MW), Tucheng 14 (2.4MW), and Songhe Caisan (7.2MW) operated 668 days, Songhe Cai'er (3.6MW) operated 346 days (668 days minus the equipment halting days 328 days, 246 days from 02-February-2019 to 05-October-2019, and 76 days from 11-October-2019-25-December-2019), thus, the estimated emission reductions are calculated as 789,569 t CO₂e, ie. $789,569 \text{ tCO}_2\text{e} = 1,106,827 \text{ tCO}_2\text{e} \times 14.4 \text{ MW} / 22.8 \text{ MW} + 1,106,827 \text{ tCO}_2\text{e} \times 3.6 \text{ MW} / 22.8 \text{ MW} \times 346 \text{ days} / 668 \text{ days}$.

⁷ $(793,277 \text{ tCO}_2\text{e} - 789,569 \text{ tCO}_2\text{e}) / 789,569 \text{ tCO}_2\text{e} = 0.47\%$

Scope 10 is not related to the project applying the methodology ACM0008 in both PD and MR.			
Project participant response (1st round)			
The scope 10 is deleted in the revised PD and MR.			
Documentation provided by project participant (1st round)			Date: 03/07/2020
☒ Changes in PD	Section(s): 1.2	New version No.: 2.0	
☒ Changes in MR	Section(s): 1.2	New version No.: 2.0	
☐ Changes in XLS	Worksheet(s):	New version No.:	
☐ Other:			
DOE assessment (1st round)			Date: 04/07/2020
The revised scope is confirmed as correct and consistent with previous CDM verification report ^{VER/} . Through the onsite visit, interviewing the project owner and reviewing the project design, it was confirmed that the project was 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 08: Mining/mineral production as per the UNFCCC Standard "Applicability of sectoral scopes version 01.0".			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	02	Section no.	1.3	Date: 15/06/2020
Description of CAR				
PP did not describe and justify how the project is eligible under the scope of the VCS Program in section 1.3 of the PD according to the VCS Standard.				
Project participant response (1st round)				
It is described and justified how the project is eligible under the scope of the VCS Program in section 1.3 of the revised PD.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☒ Changes in PD	Section(s): 1.3	New version No.: 2.0		
☐ Changes in MR	Section(s):	New version No.:		
☐ Changes in XLS	Worksheet(s):	New version No.:		
☐ Other:				
DOE assessment (1st round)				Date: 04/07/2020
The PP has described and justified how the project is eligible under the scope of the VCS Program in PD as per the section 2.1.1 of VCS Standard version 4.0. 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 CDM PDD of the project, it is verified 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, 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 4.0, 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.				

Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed
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CAR ID	03	Section no.	1.9	Date:	15/06/2020
Description of CAR					
The length of CDM crediting period is missing.					
Project participant response (1st round)					
It is supplemented the length of CDM crediting period of 10 years fixed.					
Documentation provided by project participant (1st round)					Date:
☒ Changes in PD					Section(s): 1.9 New version No.: 2.0
☒ Changes in MR					Section(s): 1.6 New version No.: 2.0
☐ Changes in XLS					Worksheet(s): New version No.:
☐ Other:					
DOE assessment (1st round)					Date:
					04/07/2020
The 10 years fixed crediting period is confirmed as in line with the UNFCCC dedicated webpage of this project.					
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	04	Section no.	1.14	Date:	15/06/2020
Description of CAR					
The description of "The generation of power from CSPG will meet the requirement of national laws and regulations, also financially viable." is not applicable to the project, as the generation of power from CSPG is not the project scenario.					
Project participant response (1st round)					
It is revised the description of the Compliance with Laws, Statutes and Other Regulatory Frameworks in the revised PD.					
Documentation provided by project participant (1st round)					Date:
☒ Changes in PD					Section(s): 1.14 New version No.: 2.0
☐ Changes in MR					Section(s): New version No.:
☐ Changes in XLS					Worksheet(s): New version No.:
☐ Other:					
DOE assessment (1st round)					Date:
					04/07/2020
The PD 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 laws and regulations, Chinese National Coalmine Safety Regulation (valid in 2016) ^{/CSR/} . For the power generation to the grid, 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. Furthermore, the project is legally approved by Local government by checking the FSR approval ^{/AFSR/} , 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.					
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	05	Section no.	1.17	Date:	15/06/2020
Description of CAR					
The leakage management of the project is missing.					
Project participant response (1st round)					

The leakage management of the project is supplemented in the revised PD.			
Documentation provided by project participant (1st round)			Date: 03/07/2020
☒ Changes in PD	Section(s): 1.17	New version No.: 2.0	
☐ Changes in MR	Section(s):	New version No.:	
☐ Changes in XLS	Worksheet(s):	New version No.:	
☐ Other:			
DOE assessment (1st round)			Date: 04/07/2020
According to the applied methodology ACM0008 (Version 07) ^{/ACM0008/} and the demonstration in the PDD and section 4.4.5.3 of this report, the leakage of the project is zero, thus no related management is needed.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	06	Section no.	Cover page	Date: 15/06/2020
Description of CAR				
1. The report ID and project ID are missing in the cover page of MR. 2. For the monitoring period, if the first and last days included is not stated. 3. The monitoring period ending date is not acceptable due to TUV NORD has conducted the CDM verification since 26-Decemner-2013, and via VCS standard VVB rotation requirements, TUV NORD can only conducted the verification for 6 consecutive years.				
Project participant response (1st round)				
1. The report ID and project ID are supplemented in the cover page of MR. 2. This monitoring period covers the period from 26-February-2018 to 25-December-2019 (actually from 08:00 25-February-2018 to 08:00 25-December-2019). 3. The monitoring period has change from end date of 31-December-2019 to 25-Decemner-2019 which satisfy the 6 consecutive years verification by TUV NORD. And all the related monitoring parameters results and baseline emission, project emission and ER calculation results have been updated also.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☐ Changes in PD	Section(s):	New version No.:		
☒ Changes in MR	Section(s): Cover page	New version No.: 2.0		
☐ Changes in XLS	Worksheet(s):	New version No.:		
☒ Other:	/EBS/,/MRR/			
DOE assessment (1st round)				Date: 04/07/2020
1. The revised ID is confirmed as correct by checking the VCS website. 2. The revised MR is checked, it is confirmed that the actual date and time is correct by checking the electricity balance sheet ^{/EBS/} and meter reading record ^{/MRR/} , and comparing with the previous CDM MR and verification report ^{/VER/} . 3. The revised MR is checked, it is confirmed that the crediting period ending date has been changed to 25-Decemner-2019 as per the VCS standard VVB rotation requirements, and TUV NORD has conducted the 6 consecutive years since 26-December-2013. Also all the other parts related have been updated based on the date updated, and the results are all verified as correct.				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	07	Section no.	1.9	Date: 15/06/2020
Description of CAR				
The information provided in the section 1.9 of the MR is not related to this project, the UNFCCC link and CCER related information is not correct.				
Project participant response (1st round)				

It is a typo mistake during copy, has been revised in the section 1.9 of the MR related to the project, including the UNFCCC link and CCER registered number.			
Documentation provided by project participant (1st round)			Date: 03/07/2020
☐ Changes in PD	Section(s):	New version No.:	
☒ Changes in MR	Section(s): 1.9	New version No.: 2.0	
☐ Changes in XLS	Worksheet(s):	New version No.:	
☐ Other:			
DOE assessment (1st round)			Date: 04/07/2020
The revised MR is checked, it is confirmed that the revision is correct, the information is corresponding to this project now.			
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	08	Section no.	3.1	Date: 15/06/2020
Description of CAR				
1. The information provided in the section 3.1 of the MR is not related to this project. 2. It is observed that during this monitoring period, not all power plants ran continuously, however the related information is missing in section 3.1.				
Project participant response (1st round)				
1. It is a typo mistake during copy, has been revised in the section 3.1 of the MR related to the project. 2. It is supplemented the information of equipments halting of Laowuji Nanyi and Songhe Caier power plants in section 3.1 of the MR.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☐ Changes in PD	Section(s):	New version No.:		
☒ Changes in MR	Section(s): 3.1	New version No.: 2.0		
☐ Changes in XLS	Worksheet(s):	New version No.:		
☐ Other:				
DOE assessment (1st round)				Date: 04/07/2020
1. The revised MR is checked, it is confirmed that the revision is correct, the information is corresponding to this project now, which is verified as in line with the PDD. 2. The revised MR is checked, it is confirmed that the related description has been added. Via on-site investigation, it is confirmed that during this monitoring period, all the included power plants run continuously/ ^{LOG/} except Laowuji Nanyi power plant. Via checking the operation log and interview with the Laowuji Nanyi power plant chief/ ^{11/} , it is verified that Laowuji Nanyi power plant was at the status of equipment halting during the whole monitoring period. Furthermore, Songhe Cai'er power plant stopped operation during the period of 02-February-2019 to 05-October-2019 and 11-October-2019 to 25-December-2019 due to the concentration of CH ₄ in CMM gas was not enough for electricity generation, which has been verified by checking the operation log/ ^{LOG/} , interview with plan chief/ ^{11/} and cross checking the meter reading record/ ^{MRR/} with gas data/ ^{GMD/} .				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	09	Section no.	4.1	Date: 15/06/2020
Description of CAR				
The value of ex ante parameter of EF _{ELEC} is not in line with registered CDM PDD.				
Project participant response (1st round)				
The value of ex ante parameter of EF _{ELEC} is revised as 0.6323 tCO ₂ e/MWh in line with registered CDM PDD.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☐ Changes in PD	Section(s):	New version No.:		

☒ Changes in MR	Section(s): 4.1	New version No.: 2.0
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		
DOE assessment (1st round)		Date: 04/07/2020
The revised MR is checked, it is confirmed that the value of ex ante parameter of EF _{ELEC} is revised as 0.6323 tCO ₂ e/MWh which is confirmed as in line with registered CDM PDD.		
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	10	Section no.	4.2	Date: 15/06/2020
Description of CAR				
The standard of calibration to flow meters and electricity meters are not the latest version.				
Project participant response (1st round)				
The standard of calibration to flow meters and electricity meters are updated to the latest version.				
Documentation provided by project participant (1st round)				Date: 03/07/2020
☐ Changes in PD	Section(s):		New version No.:	
☒ Changes in MR	Section(s): 4.2		New version No.: 2.0	
☐ Changes in XLS	Worksheet(s):		New version No.:	
☐ Other:				
DOE assessment (1st round)				Date: 04/07/2020
The revised MR is checked, it is confirmed that the standard of calibration to flow meters and electricity meters are updated to the latest version, via checking the Technical administration code of meter/ ^{DLT} / and Flow Meter calibration standards/ ^{FMCS} / from public website, it is verified that the versions are the latest versions.				
Conclusion Tick the appropriate checkbox	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

Table 4. FAR from this verification

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
☐ Changes in MR	Section(s):		New version No.:	
☐ Changes in XLS	Worksheet(s):		New version No.:	
☐ Other:				
DOE assessment				Date: DD/MM/YYYY
Conclusion Tick the appropriate checkbox	☐ To be checked during the next periodic verification			

APPENDIX 5 MONITORED PARAMETERS

Table 5: 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. <i>MMELEC</i>		Methane sent to the power generators		
a) Measurement / Determination method (VWS, §§ 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 PDD and the applied methodology.	/I1/ /GMD/ /LOG/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM00 08/ /PDD/ /PS/	<i>Description:</i> MMELEC is measured continuously by the Flow meters (with temperature and pressure transmitter) and gas analysers. Flow meters (with temperature and pressure transmitter) and gas analysers are installed at each CMM power plant. MMELEC is continuously measured and hourly recorded by DCS system automatically. The MMELEC is calculated based on the value of gas flow rate, pressure, temperature measured by flow meters and CH₄ concentration of CMM measured by gas analyzers. The calculation is done by the DCS system automatically. The Flow meters (with temperature and pressure transmitter) and gas analysers monitors the Methane sent to the power generators. And the calculation is done by the DCS system automatically. The meter readings and calculation result are recorded by the operation staff of each CMM power plant daily and aggregated monthly. Meanwhile, the automatic monitoring DCS system of each CMM power plant collects the data from the meters every day and delivers them to the project owner. The PP gather all the values from 5 CMM power plants and get the total value of MMELEC. Neither failure nor exchange of meters was detected during the monitoring period.	OK	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: MM_{ELEC} is measured continuously by Flow meters (with temperature and pressure transmitter) and gas analysers of each CMM power plant, the operators read the value from the meters at 8:00 per day. Based on the difference between the two meters' values for each meter on 8:00 (next day) and 8:00 for that day the value of MM_{ELEC} is determined. Accordingly, the operator issues the daily reports. The daily reports record the quantities of gross methane sent to the power generators per day. - Based on the daily reports for a month, the PP issues a corresponding monthly report. The sum of the quantities of gross methane sent to the power generators per day is the final result as shown in the monthly report. - 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, registered PDD 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		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		independent from the calculation provided by the PP. 100% of the daily and monthly reports have been verified. <i>Conclusion:</i> The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.		
b) Accuracy and QA/QC Procedure (VWS, §§ 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/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /QA/ /TCR/ /ACM0008/ /FMCS/ /GACS/ /PDD/ /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 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 were observed during the on-site verification. In case the main meters are 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 CERs. <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 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.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
	/PS/	<i>Conclusion:</i> The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.		
c) Correctness (VWS, §§ 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>	/GMD/ /LOG/ /MR/ /MRR/ /QA/ /TCR/ /XLS/ /ACM00 08/ /PS/	☐ Correct ☒ Not correct (initial assessment) <i>Description:</i> The MMELEC during this monitoring period 26/02/2018-25/12/2019 is reported in the MR based on the value of gas flow rate, pressure, temperature measured by flow meters and CH₄ concentration of CMM measured by gas analyzers. 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 meters and CH₄ concentration of CMM measured by gas analyzers against the automatic calculation done by the DCS system, the internal audit record and daily log. <i>Conclusion:</i> The value calculated in the MR is in line with the value in the evidences, however, due to the end date of monitoring period is changed, the result needs to be updated accordingly, refer to CA 06.	GAR-06	OK
B. CONS_{ELEC,PJ}		Additional electricity consumption for capture and use or destruction of methane		
a) Measurement / Determination method (VWS, §§ 389-393)	/I1/ /EBS/	<i>Description:</i>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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 PDD and the applied methodology.	/LOG/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM00 08/ /PDD/ /PS/	CONSELEC,PJ is measured continuously by electric meters installed at each CMM power plant with accuracy of 0.5s and recorded monthly at 8:00h on 25th of each month. The meter monitors the additional electricity consumption for capture and use or destruction of methane. 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 receipts have been issued. The PP gather all the values from 5 CMM power plants and get the total value of CONSELEC,PJ. Neither failure nor exchange of all the electric meters was detected during the monitoring period. The data aggregation procedure applied by the PP is shown as follow: CONSELEC,PJ is measured continuously by electric meters of each CMM power plant, the operators read the value from the electric meters at 8:00 of 25th per month. Based on the difference between the two meter values on 8:00 of 25th and 8:00 of 25th next month the power consumption for that month is determined. Accordingly the operator issues the monthly reports. The monthly reports record the quantities of gross power consumption per month. - Based on the monthly reports, the final monthly value was reported in the monitoring report. Verifier's action:		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		This was verified by on-site interview, by observations and by cross checking with calibration records, electricity balance sheets, registered PDD 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 values have been crosschecked with electricity monthly power receipts. <i>Conclusion:</i> The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.		
b) Accuracy and QA/QC Procedure (VWS, §§ 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</i>	/I1/ /CAL/ /CMA/ /EBS/ /LOG/ /MM/ /MR/ /MRR/ /O&M/	<i>Description:</i> CONSELEC,PI is measured continuously by electric meters installed at each CMM power plant with accuracy of 0.5s and recorded monthly at 8:00h on 25th of each month. 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	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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.	/PPA/ /PWD/ /QA/ /TCR/ /ACM00 08/ /JJG/ /DLT/ /PDD/ /PHT/ /PS/	and protection process were observed during the on-site verification. In case the main meters are 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 CERs. <i>Verifier's action:</i> The above mentioned was verified by cross checking the monthly power receipts, electricity balance sheets, 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 (VWS, §§ 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.	/EBS/ /LOG/ /MR/ /MRR/ /QA/ /TCR/ /XLS/	☐ Correct ☒ Not correct (initial assessment) <i>Description:</i> The electricity of CONSELEC, PJ during period 26/02/2018-25/12/2019 is reported in the MR based on the meters readings, electricity balance sheets and monthly power receipts. <i>Verifier's action:</i> By means of checking the ER-spreadsheet against the monthly receipts, monthly electricity balance sheets and meter reading records, the internal audit record and daily log.	CAR-06	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
	/ACM00 08/ /PS/	<i>Conclusion:</i> The value given in the monitoring report is correct.		
C. GEN_y		Electricity generation by the project activity in year y		
a) Measurement / Determination method (WS, §§ 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 PDD and the applied methodology.	/I1/ /EBS/ /LOG/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM00 08/ /PDD/ /PS/	<i>Description:</i> GEN_y is measured continuously by electric meters installed at each CMM power plant with accuracy of 0.5s and recorded monthly at 8:00h on 25 th of each month. The meters monitor the electricity generation by the project activity. 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 receipts have been issued. The PP gather all the values from 5 CMM power plants and get the total value of GEN_y . Neither failure nor exchange of all the electric meters were detected during the monitoring period. The data aggregation procedure applied by the PP is shown as follow: 1. GEN_y is measured continuously by electric meters of each CMM power plant, the operators read the value from the electric meters at 8:00 of 25 th per month. Based on the difference between the two meters' values on 8:00 of 25 th and 8:00 of 25 th next month the electricity generation for that month is determined. Accordingly, the operator issues the monthly reports. The monthly reports record the	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		quantities of gross electricity generation per month. 2. 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, electricity balance sheets, registered PDD 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 values have been crosschecked with electricity monthly power receipts. <i>Conclusion:</i> The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.		
b) Accuracy and QA/QC Procedure (VWS, §§ 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</i>	/I1/ /CAL/ /CMA/ /EBS/ /LOG/	<i>Description:</i> GEN_y is measured continuously by electric meters installed at each CMM power plant with accuracy of 0.5s and recorded monthly at 8:00h on 25th of each month.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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>	/MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /QA/ /TCR/ /ACM00 08/ /JJG/ /DLT/ /PDD/ /PHT/ /PS/	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 were observed during the on-site verification. In case the main meters 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 CERs. <i>Verifier's action:</i> The above mentioned was verified by cross checking the monthly power receipts, electricity balance sheets, 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 (VWS, §§ 389-393)	/EBS/ /LOG/ /MR/	☐ Correct ☒ Not correct (initial assessment) Description:	CAR-06	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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.	/MRR/ /QA/ /TCR/ /XLS/ /ACM00 08/ /PS/	The electricity of GEN_y during period 26/02/2018-25/12/2019 is reported in the MR based on the meters readings, electricity balance sheets and monthly power receipts. Verifier's action: By means of checking the ER-spreadsheet against the monthly receipts, monthly electricity balance sheets and meter reading records, the internal audit record and daily log. Conclusion: The value calculated in the MR is in line with the value in the evidences, however, due to the end date of monitoring period is changed, the result needs to be updated accordingly, refer to CAR 06.		
D. CEF_{NMHC}		Carbon emission factor for combusted non methane hydrocarbons (various)		
a) Measurement / Determination method (WS, §§ 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.	/CMA/ /MR/ /REG/ /ACM00 08/ /PDD/ /PS/	Description: CEF_{NMHC} is the carbon emission factor for combusted non-methane hydrocarbons (various). During this monitoring period, there is no need to monitor this value due to PC_{NMHC} is lower than 1%. Verifier's action: The value of PC_{NMHC} is verified. See below assessment of PC_{NMHC}. Conclusion: The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.				
b) Accuracy and QA/QC Procedure (VWS, §§ 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>	/CMA/ /MR/ /REG/ /ACM00 08/ /PDD/ /PS/	<i>Description:</i> During this monitoring period, there is no need to monitor this value due to PC _{NMHC} is lower than 1%. <i>Verifier's action:</i> The value of PC _{NMHC} is verified. See below assessment of PC _{NMHC} . <i>Conclusion:</i> N/A	OK	OK
c) Correctness (VWS, §§ 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>	/CMA/ /MR/ /REG/ /ACM00 08/ /PDD/ /PS/	☐ Correct ☐ Not correct (initial assessment) <i>Description:</i> During this monitoring period, there is no need to monitor this value due to PC _{NMHC} is lower than 1%. <i>Verifier's action:</i> N/A <i>Conclusion:</i> N/A	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
E. PC_{CH4}		Concentration (in mass) of methane in extracted gas (%), measured on wet basis		
a) Measurement / Determination method (VWS, §§ 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 PDD and the applied methodology.	/I1/ /GMD/ /LOG/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /ACM00 08/ /PDD/ /PS/	Description: PC_{CH4} is measured continuously by the gas analysers installed at each CMM power plant with the accuracy of 0~1% methane: $\pm 0.07\%$ & 1%~100% methane: $\pm 7\%$. Via on-site investigation and checking the MR, it is confirmed that there're two gas pipelines in power plant Tucheng 13, Songhe Caisan and Songhe Caier. Each gas pipeline is equipped with one flow meter. However, only one gas analyzer installed in each of the two power plants. Via checking the explanation in the 1 st MR, it is confirmed that one gas analyser is sufficient to measure the components and corresponding concentration (including methane concentration) of the CMM in the two gas pipelines because the methane concentration is the same in both pipelines. The meter installation of the two power plants is in accordance with the monitoring plan and the applied methodology, and the monitoring system can accurately monitor the amount and concentration of methane sent to the generator. PC_{CH4} is continuously measured and hourly recorded by DCS system automatically. The PC_{CH4} is calculated based on the CH ₄ concentration of CMM measured by gas analyzers. The monthly value is calculated by the hourly recorded data, the value of each month is the weighted average value. The gas analysers monitors the concentration (in mass) of methane in extracted gas (%). The gas analysers readings are recorded by the operation staff of each CMM power plant daily	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		and aggregated monthly. Meanwhile, the automatic monitoring DCS system of each CMM power plant collects the data from the gas analysers every day and delivers them to the project owner. The PP gather all the values from 5 CMM power plants. Neither failure nor exchange of gas analysers were detected during the monitoring period. <i>Verifier's action:</i> This was verified by on-site interview, by observations and by cross checking with calibration records, registered PDD 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 hourly and monthly reports have been verified. <i>Conclusion:</i> The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.		
b) Accuracy and QA/QC Procedure (VWS, §§ 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</i>	/I1/ /CAL/ /CAL/ /CMA/	<i>Description:</i> Refer to Appendix 6 for the accuracy details of each meter. The calibrations of all the gas analysers were performed annually by a qualified 3rd party entity according to national industry standard and records maintained.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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>	/GMD/ /LOG/ /MM/ /MR/ /MRR/ /O&M/ /PPA/ /PWD/ /QA/ /TCR/ /ACM00 08/ /FMCS/ /GACS/ /PDD/ /PHT/ /PS/	QA/QC procedure for gas analysers calibration maintenance and recording; procedure for monitoring staff training and competence were established and implemented. The data flow and protection process were observed during the on-site verification. In case the main gas analysers is out of order, no emission reductions will be claimed. The monitored data will be kept for two years after the last issuance of CERs. <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 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 gas analysers used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.		
c) Correctness (VWS, §§ 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/ /MR/ /MRR/ /QA/ /TCR/	☐ Correct ☒ Not correct (initial assessment) <i>Description:</i> The PC_{CH4} during this monitoring period 26/02/2018-25/12/2019 is reported in the MR based on the value of CH₄ concentration of CMM measured by gas analyzers. <i>Verifier's action:</i>	GAR-06	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>	/XLS/ /ACM0008/ /PS/	By means of checking the ER-spreadsheet against the hourly value of CH ₄ concentration of CMM measured by gas analyzers against the automatic calculation done by the DCS system, the internal audit record and daily log. <i>Conclusion:</i> The value calculated in the MR is in line with the value in the evidences, however, due to the end date of monitoring period is changed, the result needs to be updated accordingly, refer to CAR 06.		
F. PC_{NMHC}		NMHC concentration (in mass) in extracted gas		
a) Measurement / Determination method (WS, §§ 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 PDD and the applied methodology.</i>	/I1/ /CMA/ /MR/ /REG/ /ACM0008/ /PDD/ /PS/	<i>Description:</i> PC_{NMHC} is measured annually, the value is monitored by the laboratory of Coal Mine Exploration of Guizhou Province sampled at the inlet of gas analyser, which is a qualified and independent organization. And the value in the MR is obtained through annual composition analysis report of the extracted gas issued by this organization. <i>Verifier's action:</i> The reported data has been checked with the annual composition analysis report of the extracted gas issued by the laboratory of Coal Mine Exploration of Guizhou Province. <i>Conclusion:</i> The measurement is documented as per registered PDD and applied methodology ACM0008 version 07.	OK	OK
b) Accuracy and QA/QC Procedure (WS, §§ 394-400)	/I1/ /CMA/	<i>Description:</i>	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 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>	/MR/ /REG/ /ACM00 08/ /PDD/ /PS/	The laboratory of Coal Mine Exploration of Guizhou Province sampled and analyzed the value of PC_{NMHC} annually and issued the annual composition analysis report of the extracted gas accordingly. <i>Verifier's action:</i> The reported data has been checked with the annual composition analysis report of the extracted gas issued by the laboratory of Coal Mine Exploration of Guizhou Province. <i>Conclusion:</i> The applicable QA/QC procedures are met.		
c) Correctness (WS, §§ 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>	/I1/ /CMA/ /MR/ /REG/ /ACM00 08/ /PDD/ /PS/	☒ Correct ☐ Not correct (initial assessment) <i>Description:</i> The PC_{NMHC} during this monitoring period 26/02/2018-25/12/2019 is reported in the MR based on the value monitored by the laboratory of Coal Mine Exploration of Guizhou Province sampled at the inlet of gas analyser. And the value in the MR is obtained through annual composition analysis report of the extracted gas issued by this organization. The annual composition analysis report results show that PC_{NMHC} of all power plants is lower than 1%. <i>Verifier's action:</i> The reported data has been checked with the annual composition analysis report of the extracted gas issued by the laboratory of Coal Mine Exploration of Guizhou Province. <i>Conclusion:</i>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The value given in the monitoring report is correct.		

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 monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
M1	GEN_y $CONSELEC,PJ$	83336	DSSD132	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M1a	$CONSELEC,PJ$	64465	DSSD666	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M1b	$CONSELEC,PJ$	64469	DSSD666	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M2	GEN_y $CONSELEC,PJ$	93649	DSSD132	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M3	GEN_y $CONSELEC,PJ$	30278	DSSD79-GF	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M4	GEN_y $CONSELEC,PJ$	64467	DSSD666	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
M5	GEN_y $CONSELEC,PJ$	02217	DSSD79-GF	0.5s	13/12/2017	31/08/2018 30/08/2019	30/08/2019- 29/08/2020	☒ No ☐ Yes	From: To:
F1-Flow Meter	MM_{ELEC}	10300	GLY80	1.5%	03/09/2017	03/09/2018 03/09/2019	02/09/2019- 02/09/2020	☒ No ☐ Yes	From: To:

F1-Pressure transmitter				1.5%				☒ No ☐ Yes	From: To:
F1-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
C1-Gas analyzer	MM ^{ELEC} PC _{CH4}	4548	GJG100H (C)	0~1% methane: ±0.07%; 1%~100% methane: ±7%	18/07/2017	29/05/2018 29/05/2019	28/05/2019- 28/05/2020	☒ No ☐ Yes	From: To:
F2-Flow Meter				1.5%				☒ No ☐ Yes	From: To:
F2-Pressure transmitter	MM ^{ELEC}	121613	GLY80(A)	1.5%	28/08/2017	28/08/2018 28/08/2019	27/08/2019- 27/08/2020	☒ No ☐ Yes	From: To:
F2-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
F2'-Flow Meter				1.5%				☒ No ☐ Yes	From: To:
F2'-Pressure transmitter	MM ^{ELEC}	121614	GLY80(A)	1.5%	28/08/2017	28/08/2018 28/08/2019	27/08/2019- 27/08/2020	☒ No ☐ Yes	From: To:
F2'-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
C2-Gas analyzer	MM ^{ELEC} PC _{CH4}	4560	GJG100H (C)	0~1% methane: ±0.07%; 1%~100% methane: ±7%	18/07/2017	29/05/2018 29/05/2019	28/05/2019- 28/05/2020	☒ No ☐ Yes	From: To:
F3-Flow Meter	MM ^{ELEC}	121610	GLY80(A)	1.5%	28/08/2017	28/08/2018 28/08/2019	27/08/2019- 27/08/2020	☒ No ☐ Yes	From: To:
F3-Pressure transmitter				1.5%				☒ No ☐ Yes	From: To:

F3-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
C3-Gas analyzer	MM _{ELEC} PC _{CH4}	5659	GJG100H (B)	0~1% methane: ±0.07%; 1%~100% methane: ±7%	18/07/2017	29/05/2018 29/05/2019	28/07/2019- 28/05/2020	☒ No ☐ Yes	From: To:
F4-Flow Meter	MM _{ELEC}	121612	GLY80(A)	1.5%	28/08/2017	28/08/2018 28/08/2019	27/08/2019- 27/08/2020	☒ No ☐ Yes	From: To:
F4-Pressure transmitter				1.5%				☒ No ☐ Yes	From: To:
F4-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
F4'-Flow Meter	MM _{ELEC}	121611	GLY80(A)	1.5%	28/08/2017	28/08/2018 28/08/2019	27/08/2019- 27/08/2020	☒ No ☐ Yes	From: To:
F4'-Pressure transmitter				1.5%				☒ No ☐ Yes	From: To:
F4'-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
C4-Gas analyzer	MM _{ELEC} PC _{CH4}	4571	GJG100H (C)	0~1% methane: ±0.07%; 1%~100% methane: ±7%	18/07/2017	29/05/2018 29/05/2019	28/05/2019- 29/05/2020	☒ No ☐ Yes	From: To:
F5-Flow Meter	MM _{ELEC}	131539	GLY80(A)	1.5%	15/09/2017	15/09/2018 15/09/2019	14/09/2019- 14/09/2020	☒ No ☐ Yes	From: To:

F5-Pressure transmitter				1.5%				☒ No ☐ Yes	From: To:
F5-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
F5'-Flow Meter				1.5%				☒ No ☐ Yes	From: To:
F5'-Pressure transmitter	MM _{ELEC}	131540	GLY80(A)	1.5%	15/09/2017	15/09/2018 15/09/2019	14/09/2019- 14/09/2020	☒ No ☐ Yes	From: To:
F5'-Temperature transmitter				2.5%				☒ No ☐ Yes	From: To:
C5-Gas analyzer	MM _{ELEC} PC _{CH4}	1528	GJG100H (B)	0~1% methane: ±0.07%; 1%~100% methane: ±7%	18/07/2017	29/05/2018 29/05/2019	28/05/2019- 28/05/2020	☒ No ☐ Yes	From: To: