



LIYANG 15 MW LOW-CONCENTRATION CMM POWER GENERATION PROJECT



Document Prepared by TÜV Rheinland Energy & Environment GmbH

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Summary:

The “Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd.” has commissioned the VVB TÜV Rheinland Energy & Environment GmbH. (hereafter referred to as TÜV Rheinland) to perform a validation of the Project Activity “Liyang 15 MW Low-concentration CMM Power Generation Project ” (hereafter called “the project”) in China. This report summarizes the findings of the validation and verification of the project, performed on the basis of VCS Standard Version 4.5 requirements, as well as criteria given to provide for consistent project operations, monitoring and reporting:

- A description of the validation and the project

The validation for the project activity is performed simultaneously by VVB TÜV Rheinland Energy & Environment GmbH (hereafter referred to as TÜV Rheinland). The proposed project is to utilize low concentration CMM (methane concentration lower than 30%) from Liyang coal mine for power generation and the generated electricity is supplied to the North China Power Grid (NCPG), to displace the electricity generated by NCPG dominated by fossil fuel-fired power plants. Waste heat generated by the gas generators will be utilized for heat supply to the coal mine to replace part of the heat generated by the gas-fired boilers.

- The purpose and scope of validation

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant Verra and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified Carbon Units (VCUs).

The validation scope is defined as an independent and objective review of the PD. The PD is reviewed against the relevant criteria and decisions by Verra, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual employed a rule-based approach, focusing on the identification of significant risks for project implementation and the generation of VCUs.

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

- The method and criteria used for validation

Validation is conducted using TÜV Rheinland procedures in line with the requirements specified in the latest version of the VCS Validation and Verification Manual and applying auditing techniques. The validation team assessed the project activity's compliance against the VCS Standard, Version 4.5, the selected CDM methodology and the project description. The project is eligible under Project Scope 01, and 08.

The validation criteria followed the guidance documents provided by VCS included the following: VCS

Standard Version 4.5, VCS Program Guide Version 4.1 and the applied CDM methodology ACM0008 (Version 08.0) "Abatement of methane from coal mines".

- The number of findings raised during validation

During the validation and verification, 6 Corrective Action Requests (CARs), 4 Clarification Requests (CLs) were raised and successfully closed. The findings of the validation are stated in the following sections. The validation criteria (requirements), the results from validating the identified criteria are documented in more detail in the revised validation report.

- Any uncertainties associated with the validation

There are no restrictions of uncertainty for validation.

- Summary of the validation conclusion

Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd. has commissioned the TÜV Rheinland Energy & Environment GmbH to perform the validation of the VCS Project Activity "Liyang 15 MW Low-concentration CMM Power Generation Project". The validation is based on the information made available to the validation team. The validation team of TÜV Rheinland would not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

According to VCS Standard Version 4.5, the validation activities including objectives, scope and criteria, level of assurance, project description, baseline scenario, additionality, emission reduction and monitoring plan adhere are assessed by TÜV Rheinland Energy & Environment GmbH. The validation team has checked that the project correctly applies ACM0008 (Version 08.0), "Abatement of methane from coal mines" which is the most recent version of the methodology available at the time of first submission of the project activity for VCS Standard. The total emission reductions from the project are estimated to be on the average 456,021 tCO₂e annually and total emission reduction **4,560,209** tCO₂e over the fixed 10-year crediting period.

In summary, the validation team concludes that the VCS Project Activity "Liyang 15 MW Low-concentration CMM Power Generation Project" in the P. R. China, as described in the PD (Version 04.1 of 30 August 2024) meet all relevant requirements of the VCS Standard Version 4.5 for the VCS project activities. The VVB therefore requests the registration of the project as a VCS project activity.

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1 INTRODUCTION

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant Verra and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. The validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and likelihood that methods and procedures set out in the project description will generate verifiable GHG data and information when implemented. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the PD. The PD Version 04.1 of 30 August 2024 is reviewed against the relevant criteria and decisions by VCS Standard Version 4.5, including the approved baseline and monitoring methodology, ACM0008 (Version 08.0), " Abatement of methane from coal mines ". The validation team has, based on the recommendations in the Validation and Verification Manual employed a rule-based approach, focusing on the identification of significant risks for project implementation and the generation of VCUs.

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

1.3 Reasonableness of Assumptions

Indicate the reasonableness of assumptions, limitations, and methods that support a claim about the outcome of future activities.

The project will generate 456,021 tCO₂e per year. The threshold for materiality with respect to the aggregate of errors, omissions, and misrepresentations relative to the total reported GHG emission reductions and/or removals shall be five percent for projects.

The estimated GHG emission reductions and removals of the project activity are calculated on the basis of assumed scenarios as per the applied methodology. The reasonableness of the assumptions has been justified in section 4 of the PD. TÜV Rheinland Energy & Environment GmbH has undertaken a reasonable assessment of the applicability of the methodology, the baseline scenario selection, the values and sources of the parameters used for calculating GHG emission reductions from the project activity, in accordance with VCS Standard Version 4.5 and all the GHG program requirements, to assure

the assumptions have been justified correctly. The detailed validation is described in this report, section 3.3

1.4 Summary Description of the Project

Through document review of the PD /1/ and on-site interview with the representatives from the project owner, the validation team confirmed that the project is implemented by **Beijing Yonder Environmental Energy Technology Co., Ltd.** The Validation Team confirms that the proposed project is to utilize low concentration CMM (methane concentration lower than 30%) from Liyang coal mine for power generation and the generated electricity is supplied to the North China Power Grid (NCPG). Waste heat generated by the gas generators will be utilized for heat supply to the coal mine. The concentration of low CMM is expected to be around 16% under normal production conditions for the project according to indicated in FSR /25/ and 25.5 million Nm³ of methane annually is destroyed. The total installed capacity of the project is 15MW.

Prior to the implementation of the Project, the low concentration CMM extracted is directly vented into the atmosphere due to the safety reasons as assessed in Section 3.3.4 below and power demand of coalmine are met by grid electricity imports from NCPG, the heat was provided by gas-fired boilers /25/.

The project activity will be constructed in phase, which involved the construction and operation of 20 sets of CMM gas generators with each capacity of 0.6MW, and the total capacity of 12 MW for power generation in the first phase, The remaining capacity with 3MW (4*0.5MW+1MW) is expected to be completed by March 2025, however, this is contingent upon the volume and concentration of low CMM available at that time. The construction has been confirmed by verifying FSR/25/, the project owner's statement /29/ and interview with local staff of Liyang Power Station and PP.

The project is expected to achieve 456,021 tCO₂e of emission reductions annually, The total estimated GHG emission reductions for the 10-years crediting period are 4,560,209tCO₂e.

The project is in South Liyang Village, Liyang Township, Heshun County, Jinzhong City, Shanxi Province, P. R. of China. The geographical coordinates in the project activity is indicated in PD, which is consistent with the FSR /25/.

The project has been put into operation on 1 March 2022. Therefore, the project start date is 1 March 2022 with the VCS ref. No. 4499 in the PD Version 04.1 of 30 August 2024 /1/, which has been justified by the Validation Team (please refer to detailed discussion in Section 3.3 of this report).

In summary, through the validation by means of documentation review and on-site assessment & interviews with stakeholders, the Validation Team concludes that the project description in the PD with Version 04.1 of 30 August 2024 is complete and accurate.

2 VALIDATION PROCESS

2.1 Method and Criteria

Describe the method and criteria, including the evidence-gathering plan, used for undertaking the validation. Where evidence-gathering plans are used as a part of the validation, include a description of the evidence-gathering approach, important assumptions, and justification of the chosen approach.

Describe the validation schedule, including key milestones (e.g., kick-off meeting, desk review, site visit) and corresponding dates.

TÜV Rheinland used a risk-based assessment approach for the validation process to develop the validation sampling plan as part of the validation activities.

In an early stage of the validation process, the project proponent has been requested to submit the PD, copies of relevant proofs and other relevant project information. After reviewing and evaluating these documents, a strategic and a risk analysis have been performed in order to enable a statement at a reasonable level of assurance that the project complies with the requirement of the VCS Standard Version 4.5 as well as other relevant requirements set out in VCS rules and applied methodology.

The following table presents the areas of concerns, the associated risks and the initially selected assessment methods:

Area of concern	Risk	Assessment method
Project boundaries	Incorrect delineation vs. existing project.	Validation audit, Google Earth images, GPS on-site, interview with major organisations involved in the project, and an on-site inspection.
Start date of the project	Non-compliance with VCS rules.	Interview & document review.
Applicability	Inappropriate methodology.	Interviews & document review.
Baseline scenario	Incorrect definition and determination.	Interviews, document reviews and on-site inspection.
Additionality	Inappropriate Regulatory Surplus evaluation, barrier identification & evaluation, and common practice analysis.	Data check, review of investment model and interviews with local experts.
Estimated VCUs	Mistakes, inappropriate assumptions and estimations of	Review of historical data, defined parameters, applied algorithms

	ex-ante parameters.	and submitted calculation files.
Monitoring plan	Unrepresentative samples or inadequate sample monitoring.	Interviews, document reviews and on-site inspection.
QA/QC	Data quality.	Interviews & document review.

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

The validation consists of the following phases:

- Selection of an appropriate validation team.
- Desk review of the PD and supporting documents.
- Development of the audit plan.
- On-site visit and follow-up interviews with project stakeholders.
- Resolution of outstanding issues and issuance of a draft validation & verification report.
- Internal review and issue of the final validation & verification report.

The validation & verification of the proposed project activity has been performed in accordance with the internal procedures of TÜV Rheinland Energy & Environment GmbH for the validation of GHG projects, which strictly follows ISO 14064-3: 2019 requirements.

2.2 Document Review

Describe how the validation was performed as an audit where the project description and any supporting documents were reviewed, cross-checked, and compared with identified and stated requirements.

The PD Version 04.1 of 30 August 2024 were assessed as part of the validation. Relevant documents were reviewed. A detailed documents reviewed are listed in Appendix 1 of the report.

2.3 Interviews

Describe the interview process and identify personnel, including their roles, who were interviewed and/or provided information additional to that provided in the project description and any supporting documents.

On 22 November 2023, the validation team of TÜV RHEINLAND ENERGY & ENVIRONMENT GMBH performed personal interview with representatives of the project owner and local authorities at the project site. The main topics interviewed are as follows:

	Date	Name	Organization	Topic
/i/	22 November 2023	Wang Chao;	Beijing Yonder Environmental	- Project management

			Energy Technology Co., Ltd	- Project financing - Sustainable issues - Project implementation - Additionality issues - Technical issues - Staff Training Local environmental condition - SDG impacts
/ii/	22 November 2023	Guo Minghua Song Xiaotong	VCS Consultant/ Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co.	
/iii/	22 November 2023	Hou Siyang	Developer/Green Inclusive Technology (Beijing) Co., Ltd.	
/iv/	22 November 2023	Qing Lihong	Liyang Power Station	
/v/	22 November 2023	Li Bo	Liyang Coal Mine	
/vi/	22 November 2023	Wang Huiqiang	Local Stakeholders, in local village	- Local environment conditions - Job opportunities - Organic manure and tariff - Carbon waiver - Scenario before the project started - Comments to the project
/vii/	22 November 2023	Zhang Xin; Guo Shijun; Zhang Xiaobo	Officers from Jinzhong City Ecology and Environment Bureau, Development and Reform Commission of Jinzhong City, Grid Company of Jinzhong City	- Project approval - Local economy - SDG impacts - Continuous Inputs - Grievances mechanism - Local legislation to CMM utilization

2.4 Site Visits

Describe the method and objectives for site visit(s) performed. Include in the description details of all facilities and/or project areas visited, the physical and organizational aspects of the project assessed and the dates when such site visits took place.

The validation team performed the on-site validation (South Liyang Village, Liyang Township, Heshun County, Jinzhong City, Shanxi Province, China) on 22 November 2023. The interviewed personnel and objective are listed in above table.

Date	Site Location	Agenda / Topic / Objectives	Interviewed Persons
22 November 2023	Office from Liyang CMM Power Station	Opening meeting, interview	Project owner, consultant, project developer, representatives from local communities
22 November 2023	Liyang CMM Power Station	On site inspection for facilities and project utilizations	Project owner, consultant, local communities
22 November 2023	Office from Liyang CMM Power Station	Document review	Project owner, consultant
22 November 2023	Office from Liyang CMM Power Station	Closing meeting and finding summary	Project owner, consultant

2.5 Resolution of Findings

Describe the process for the resolution of findings (corrective actions, clarifications or other findings) raised by the validation team during the validation.

State the total number of corrective action requests, clarification requests, forward action requests and other findings raised during the validation.

Provide a summary of each finding, including the issue raised, the response(s) provided by the project proponent, and the final conclusion and any resulting changes to project documents. Unless this fits on one page, put all findings in an appendix.

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's conclusion on the project design. In order to ensure transparency a validation protocol is customized for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a VCS project is expected to meet;

- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of two tables. The different columns in these tables are described in the figure below. The completed validation protocol for this project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of VCS criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) VCS and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a VCS project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

In the course of the validation of the project activity, 6 Corrective Action Requests (CARs) and 4 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

2.5.1 Forward Action Requests

This is the validation, thus there is no FAR raised in the period.

3 VALIDATION FINDINGS

3.1 Project Details

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

- Project type:

The PD Version 04.1 of 30 August 2024 /1/ is completed based on the the VCS project design template.

Through document review of PD and on-site interview with the representatives from the project owner, the Validation Team confirms that the proposed project is to utilizes low concentration CMM (methane concentration lower than 30%) from Liyang coal mine for power generation and the generated electricity is supplied to the North China Power Grid (NCPG). Waste heat generated by the gas generators will be utilized for heat supply to the coal mine. No coal bed methane (CBM) or ventilation

air methane (VAM) utilization is involved based on interview with staff from Liyang Coal Mine and FSR /25/. The project was owned by Beijing Yonder Environmental Energy Technology Co., Ltd. and located in South Liyang Village, Liyang Township, Heshun County, Jinzhong City, Shanxi Province, China, is designed to prevent the low-concentration CMM extracted from the Liyang Coal Mine from being vented directly into the atmosphere for safety reasons. This initiative in the project area also involves importing electricity from NCPG and utilizing heat from gas-fired boilers.

Therefore, it was confirmed that the sectoral scope is Scope 01: Energy industries (renewable - / non-renewable sources) and Scope 8 Mining/mineral production as per VCS sectoral scopes/4/.

It was confirmed that the project is not a grouped project.

- Technologies and measures implemented:

Through document review of PD/1/, Feasibility Study Report (FSR) /25/, FSR approval /26/, EIA /27/, EIA approval /28/ and on-site interview with the representatives from the project owner, the Validation Team confirms that totally 24 CMM gas generators with 24 waste heat boilers ($20 \times 0.6\text{MW} + 4 \times 0.5\text{MW}$) and one set of steam turbine generator with 1MW will be installed in the project activity. The proposed project is to utilize low concentration CMM (methane concentration lower than 30%) from Liyang coal mine for power generation and the generated electricity is supplied to the North China Power Grid (NCPG) to displace the electricity generated by NCPG dominated by fossil fuel-fired power plants. Waste heat generated by the gas generators will be utilized for heat supply to the coal mine. The waste heat from gas generators is recovered by waste heat boilers, and saturated steam from waste heat boilers will be supplied to the steam turbine generator to produce electricity, surplus saturated steam will be supplied to the coal mine to replace part of the heat generated by the gas-fired boilers. The annual operating hours to be 5,500 hours based on the FSR/25/, and thus the plant load factor (PLF) is 0.6279.

According to onsite inspection, interviewed with PP, and verified with the project owner's statement /29/, the validation team confirmed that the project activity will be constructed in phase, which involved the construction and operation of 20 sets of CMM gas generators with each capacity of 0.6MW, and the total capacity of 12 MW for power generation in the first phase, the remaining capacity with 3MW ($4 \times 0.5\text{MW} + 1\text{MW}$) is expected to be completed by March 2025.

TÜV Rheinland inspected on site, and checked the installed equipment and reviewed FSR /25/, and confirm that it is in line with the technical specification addressed in PD Version 04.1 of 30 August 2024 /1/.

The project is applicable to the applied CDM Methodology ACM0008 (Version 08.0) "Abatement of methane from coal mines" /45/.

The expected total emission reduction of the Project in the crediting periods of 10 years (from 01 March 2022 to 29 February 2032) is 4,560,209 tCO₂e, and the annual emission reduction is estimated to be 456,021 tCO₂e.

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

- Eligibility of the project

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 4.5 /4/. The assessment is provided as below,

1. The project activity generates GHG emission reductions including CH₄ and CO₂ which belong to the seven Kyoto Protocol greenhouse gases.
2. Ozone-depleting substances: Not applicable
3. Project activities supported by a methodology approved under the VCS Program through the methodology development and review process: Not applicable.
4. Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval: The project activity applied ACM0008 (Version 08.0) Abatement of methane from coal mines, which is approved methodology under a VCS approved GHG program in accordance with VCS Standard Version 4.5/4/.
5. Jurisdictional REDD+ programs and nested REDD+ projects as set out in the Jurisdictional and Nested REDD+ (JNR) Requirements: Not applicable.
6. “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 PD of the project, it is verified that the project is implemented to utilize the low concentration CMM from Liyang Coal mine for power generation to avoid the previously vented gas that will be captured and destroyed in the baseline scenario 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.
7. The VCS Program also excludes the following project activities under the circumstances indicated in Table 1 of section 2.1.3 of VCS Standard Version 4.5/4/, via checking all the excluded project activities in the table, it is verified that this project type is not excluded by the scope of VCS program.

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

- **Project design, including eligibility criteria for grouped projects**

The project includes only one location/project activity instance by checking FSR/26/ and onsite inspection, it is not being developed as a grouped project.

- **Project proponent and other entities involved in the project**

The project proponent and the contact information reported in section 1.5 of the PD/1/ have been confirmed to be correct through checking the business license of the company/23/, FSR /25/, FSR approval /26/, EIA /27/and EIA approval/28/ and interviewing with the PP representative through the on-site visit.

The other entities involved in the Project (Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd.) as VCS consultant to be responsible for carbon credits development. Shanxi Shengdong Qingtian New Energy Co., Ltd. is responsible for project activity operation, which is Beijing Yonder Environmental Energy Technology Co., Ltd.'s fully subsidiary. The assessment team interview the representative of this company during the on-site visit and confirm the contact information reported in section 1.6 of the VCS PD are correct.

- **Ownership**

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

Via checking the National legal approval to the FSR/25/, FSR approval /26/, Environmental Impact Assessment (EIA) and approval /27//28/, and the business license of the Beijing Yonder Environmental Energy Technology Co., Ltd./23/. It is verified that PP has the legal right to control and operate the project activity. Thus, it is confirmed that the project owner has the ownership of the project.

- **Project start date**

According to VCS Standard Version 4.5/4/, the start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals. According to the project acceptance report issued on 1 March 2022 /30/ and onsite interview, the validation team confirm the project started operation on 1 March 2022 and confirm that this is the earliest time to generate GHG emission reductions. Thus, it is confirmed that the start date of the project was identified as 1 March 2022.

- **Project crediting period**

This project adopts fixed crediting periods of 10 years. The crediting period is 10 years from 01 March 2022 to 29 February 2032 (both days included), which is in line with the concept for crediting period in section 3.9.1 of the VCS Standard Version 4.5 /4/.

- **Project scale and estimated GHG emission reductions or removals**

The annual GHG emission reduction of the project is estimated to be 456,021 tCO₂e which is higher than 300,000 tonnes of CO₂e per year. Therefore, the validation team confirm that the project scale falls under the category of "Large Project" based on section 3.10.1 of VCS Standard Version 4.5. And the estimated total Estimated GHG Emission Reductions or Removals during the 10 years of VCS fixed crediting period (from 01 March 2022 to 29 February 2032) is 4,560,209 tCO₂e.

- **Project location**

The project is in South Liyang Village, Liyang Township, Heshun County, Jinzhong City, Shanxi Province, China. The geographical coordinates for the project are between east longitude 113°37'23" and north latitude 37°24'24", The project location was confirmed during site visit by GPS devices and PD/1/.

- **Conditions prior to project initiation**

The scenario existing prior to the start of the implementation of the project activity is that all the low concentration CMM gas is vented into the atmosphere without destruction or utilization, and an equivalent amount of electricity is generated in the NCPG, heat was provided by gas fired boilers. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity, which has been confirmed during the interview and checking section 1.11 of PD.

Therefore, via interview with local residents and local government officers during on-site inspection, verified the extraction station operation record /31/ and FSR /26/, the validation team confirmed that the project is not to be implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction

Refer section 3.4 below for detailed baseline scenario assessment.

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

The PD /1/ has stated that the project is in line with the relevant laws and regulations, which includes "Several opinions of the General Office of the State Council on accelerating the extraction and utilization of coal mine gas (coal mine methane)" /37/, "Chinese National Coalmine Safety Regulation" /38/ and "Notice of the National Development and Reform Commission on the issuance of the twelfth Five-Year Plan for The Development and Utilization of Coal Mine Gas (Coal Mine Methane)" /39/ as listed in the PD/1/.

Moreover, the project is legally approved by Local government by checking the Project approval /26/, EIA approval/28/, and Grid connection approval /41/, which means that the project is in line with the national and local laws and regulations. And as stated in the PD/1/ and confirmed by interview with local officer,

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

- **Participation under other GHG programs:**

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

The validation team checked the registry of CDM EB (<http://cdm.unfccc.int>), Gold Standard (<http://www.goldstandard.org>), China Certified Emission Reduction (CCER), and other GHG program. It is confirmed that the project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program.

- Rejection by other GHG programs

The project has neither been registered nor seeking registration under any other GHG programs. Therefore, the project is not rejected by any other GHG programs.

- **Other forms of credit and supply chain (Scope 3) emissions:**

- Emissions trading programs and other binding limits

The project proponent is not part of any emission trading program which has been confirmed via checking the UNFCCC/71/, GS/72/, VCS/73/ and other GHG schemes' website. The net GHG emission reductions from the project will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions. The project activity has not participated under any other GHG programs. It is verified that the implementation of the project is consistent with the description in the PD/1/.

Furthermore, based on validation and verification team's local expertise, China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries which has been verified in the public website/42/, and it is confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/42/. Hence, it is confirmed that the emission reductions will not be double counted.

In addition, the project owner has signed the Declaration of No Double Counting Statement and Declaration of not involved in other GHG scheme /68/ to ensure that the project will not apply for emission reduction credits or labels under any other schemes other than VCS.

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

Through interviewing with the project developer and based on above assessment, it is confirmed that the project has not created any other form of environmental credit.

- Issuance of public statement(s) to help prevent Scope 3 emissions double claiming.

According to VCS Standard Version 4.5 /4/, the "supply chain" definition from VCS Program Definitions version 4.3 /6/ and Scope 3 definition in GHG Protocol /75/, and also inspected on site, the CMM

extracted would be used by the project, electricity generated is for grid, heat generated is for coal mine, this project does not directly impact emissions associated with any goods or services, the project activity is not relevant to Scope 3 emissions, and the project is not applicable for Scope 3 emissions.

Moreover, the validation team checked and confirmed that the contract signed between the coal mine owner and PP /33/ states that both parties agreed that only PP has the right to develop the GHG program from the low-concentration CMM extraction. Therefore, according to the contract /33/, the coal mine owner has no right to develop the GHG program from the project.

- Email notification of the potential risk of Scope 3 emissions double claiming
- As mentioned above, the project activity is not relevant to Scope 3 emissions.

• Sustainable development contributions

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

1. SDG 7: “Ensure access to affordable, reliable, sustainable and modern energy for all”,. – It is verified by interview with representatives of local stakeholders and by checking FSR /25/ and EIA /27/ and confirm that electricity with 77,550 MWh per year will be generated by the project to supply to NCPG. Hence, the contribution to this SDG has been confirmed, moreover, the provisions for monitoring and reporting this goal is that the electricity will be continuously monitored and reported in the monitoring period, which is verified as reasonable.
2. SDG 8: “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”.
The project activity provide job opportunities and equal pay for work of equal value will be made to both men and women, it is verified by interview with staffs and checking the labor contract for the project /36/, it is confirmed that the project has created full employment positions regardless of gender or other status, hence the contribution to this SDG has been confirmed, moreover, the provisions for monitoring and reporting this goal is that the actual local employment will be monitored during the monitoring period, which is verified as reasonable;
3. SDG 13: “Take urgent action to combat climate change and its impacts”. – It is verified by checking the Emission Reduction Calculation sheet/2/, it is confirmed that 456,021 tCO₂e emission reduction per year was achieved, hence the contribution to this SDG has been confirmed and the provisions for monitoring and reporting this goal is verified as reasonable.

• Additional information relevant to the project, including:

- Leakage management for AFOLU projects

Not applicable to the project activity

- Commercially sensitive information

No commercially sensitive information has been excluded from the public version of the project description.

Based on above assessment and demonstration, it is concluded that the description in the PD Version 04.1 of 30 August 2024/1/ is accurate, complete, and the nature of the project is actual and understandable. And it is confirmed that the project has been implemented as described in the project description via site inspection.

CAR 01,02 were raised and successfully closed. Refer to Appendix C for detailed assessment.

3.2 Safeguards

3.2.1 No Net Harm

The Environmental Impact Assessment (EIA) Report for Liyang 15 MW Low-concentration CMM Power Generation Project was approved by Ecology and Environment Bureau of Jinzhong City on 10 July 2019 /28/, The assessment team confirms all environmental impacts have been analyzed and no net harm was detected.

A comprehensive discussion on the environmental impact and the specific steps taken to mitigate potential negative impacts has been presented in section 2.1 of PD /1/, and has been confirmed by the assessment team with EIA approval/28/. The assessment team checked the same and find there are no negative potential environmental and socio-economic impacts. Moreover, based on the professional experience of assessment team, and site visit, the assessment team confirm that there are no negative potential environmental and socio-economic impacts detected during the site visit. Further clarification is addressed in section 3.2.3 of the report.

3.2.2 Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process. The assessment team checked the relevance of the dates during the validation site visit.

The project owner invited relevant personnel of Liyang Coal Mine, local villagers, and government officials to participate in the questionnaire survey. Totally 50 survey questionnaires /70/ were distributed to them for comments during on 14-November-2020.

The comments from the 50 survey questionnaires /70/ were received and summarized as follows. In total 50 out of 50 questionnaires were returned with a 100% response rate.

By checking the questionnaires, TÜV Rheinland confirms that 96% of the respondents are willing to participate in the construction and operation of the Project. 98% of the respondents believe that the Project will not have any environmental impact, 6% of the respondents believe the Project will not have any impact on coal mine safety, and 94% of the respondents consider that the Project will improve the

operational safety of the coal mine to some extent. Therefore, there is no negative comments for the project.

Moreover, a continuous Input/Grievance mechanism is set up. The PP will post notice boards, regularly convening stakeholder meetings, distributing survey questionnaires and responding to various stakeholders at periodic intervals during project operation period, moreover, the local stakeholders can leave their opinions, comments and concerns on the project and contact information by call at any time.

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

As assessed above, project owner has brought up with corresponding approaches to minimize the impact of the project on the environment and related mitigative actions have been carried out, hence, it is concluded that all the Project Owner has taken necessary measures to the inputs received. All the mitigation actions have been verified by communicate with local authority, the local officer from Department of Ecology and Environment of Jinzhong city has confirmed that the project was under supervised and the implementation of the project is in line with the local environment protection regulations and EIA/27/.

Thus, the assessment team is of the opinion that the stakeholder survey was adequate and appropriate.

3.2.3 Environmental Impact

The Environmental Impact Assessment (EIA) Report for Liyang 15 MW Low-concentration CMM Power Generation Project was approved by Ecology and Environment Bureau of Jinzhong City on 10 July 2019 /28/. The assessment team confirms all environmental impacts has been analyzed. The assessment is as below.

It is considered that the environmental impacts and the relevant mitigation methods have been comprehensively described in Section 2.3 of PD including the air pollution, wastewater, noise, solid waste and ecosystem in the period of construction and operation in local area of project site.

The environmental impact was sufficiently assessed in EIA based on Chinese laws & regulations such as “Environmental Protection Law of the People's Republic of China”/44/ and “Law of the People's Republic of China on Environmental Impact Assessment”/46/. Every aspect of environmental impact has been considered in EIA report with corresponding measures during the construction and operation period.

Via interview with the local officer from Department of Ecology and Environment Bureau of Jinzhong City, it is confirmed that the potential environmental impacts have been sufficiently identified for the construction and operation period, such as air pollution, wastewater, noise and solid waste, ecosystems etc. The conclusion of the analysis has been described in the PD /1/ and the related mitigation measures have been listed as per the approval of EIA report /28/. Due to the project has been

implemented during the site inspection, it is confirmed that the impact during the construction period has been solved and no significant environmental impacts are expected from the project activity.

During the site inspection, the project was implemented normally.

During the construction period, via interview with the local officer from Department of Ecology and Environment Bureau of Jinzhong City, it is confirmed that the potential environmental impacts have been sufficiently identified for the construction period, such as air pollution, wastewater, noise, solid waste and impact on the ecosystem etc. The conclusion of the analysis has been described in the PD as per the EIA report/27/ and the related mitigation measures have been listed as per the approval of EIA report/28/. Due to the project has been implemented during the site inspection, it is confirmed that the impact during the construction period has been solved and no significant environmental impacts are expected from the project activity.

In the period of operation, by the site inspection, the validation team confirmed that the project was implemented normally. The validator revealed EIA /27/ and EIA approval /28/, there was no adverse effect on the ecology, air, water, noise and solid waste, for the project subject to the implementation of pollution mitigation measures according to the EIA report/27/. There was also no any endangered species found in the project location.

Moreover, as per the approval of EIA /28/. it stated that the inspectors from the Ecology and Environment Bureau of Jinzhong City have to carry out monitoring work for the environmental impact arisen from the project activity. Via interview with the local officer from Ecology and Environment Bureau of Jinzhong city, it is confirmed that they are satisfactory with the environmental protection and recovery work carried out by the project owner. The Department of Ecology and Environment of Jinzhong city also did not receive any public comment on the project activity after the implementation of the project.

3.2.4 Public Comments

The project sought the registration with the VCS Program, according to VCS requirements the Project Description was submitted for public comment period. The project was allocated with VCS Project ID 4499. The public comment period started on 16 October 2023 and ended on 15 November 2023 (<https://registry.verra.org/app/projectDetail/VCS/4499>). No comments were received during this period which has been verified by checking the dedicated website.

3.2.5 AFOLU-Specific Safeguards

This section is not required as the project is not AFOLU project

3.3 Application of Methodology

3.3.1 Title and Reference

The approved consolidated methodology applied in the project activity is ACM0008 (Version 08.0), Abatement of methane from coal mines”, /12/.

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

Tool 02: “Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)” /13/

Tool 05: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 3.0)” /14/;

Tool 07: “Tool to calculate the emission factor for an electricity system” (Version 07.0) /15/

Tool 24: “Common practice (Version 03.1)” /17/

Tool 27: “Investment analysis” (version 13.0)/18/

3.3.2 Applicability

The justification of applicability criteria for the methodology, and any tools are assessed by the validation team by means of documentation review and the onsite assessment. It is the validation team’s opinion that the project fully meets the criteria as described as follows:

Applicability criteria of the methodology ACM0008 (Version 08.0)	Criteria fulfilled	Determination by the validation team
This methodology applies to project activities that aim for the use and/or destruction of the methane extracted/obtained from a working or abandoned coal mine(s). The project activities include any of the following methods to treat the methane captured: (a) The methane is destroyed without energy production, for example through flaring. (b) The methane is used to produce energy. This may include electricity, heat, vehicle fuel, etc.	☒ Yes ☐ No ☐ N/A	The coal mine extracted methane for the project is a working coal mine. The project aims to use methane (CMM) extracted from the working face of Liyang coal mine 15# coal seam. The methane is used for electricity generation. This situation belongs to category (b) of this requirement. This is verified and confirmed by site inspection and reviewed FSR/26/. Therefore, the criterion is applicable.
Emission reductions can be claimed for displacing or avoiding energy from other sources;	☒ Yes ☐ No	It is confirmed that generated electricity displaced an equivalent amount of electricity that would otherwise have been supplied by NCPG, achieving emission

Applicability criteria of the methodology ACM0008 (Version 08.0)	Criteria fulfilled	Determination by the validation team
	☐ N/A	reductions which will be calculated and claimed. Therefore, the criterion is applicable.
Methane used in the Project activities shall be extracted using the following techniques: (a) Surface drainage boreholes to capture coal bed methane (CBM) or methane from open cast mines. (b) Underground boreholes in the mine, surface goaf wells, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture coal mine methane (CMM). (c) Mine ventilation system to dilute and remove ventilation air methane (VAM). (d) Surface drainage boreholes in the case of sealed abandoned mines or ventilation system in the case of ventilated mines to capture abandoned mine methane (AMM).	☒ Yes ☐ No ☐ N/A	The validation team verified FSR, and interviewed with the staff from Liyang Coal mine, and then confirm that the Project involve the use of the following extraction activities: - Underground boreholes in the mine to capture pre mining CMM; - Underground boreholes, gas drainage galleries, surface goaf wells and other goaf gas to capture post mining CMM. Therefore, option (b) is applicable.
The remaining share of the methane, to be diluted for safety reason, may still be vented.	☒ Yes ☐ No ☐ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that the remaining share of the methane, to be diluted for safety reason, is still vented in the Project. Therefore, the criterion is applicable.
In the case of open cast mines, in addition to the conditions listed above, project activities should meet the following requirements: (a) The mines should have had a working mining concession for at least three years	☐ Yes ☐ No ☒ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that the Project involves no opencast mine. Therefore, the criterion is not applicable.

Applicability criteria of the methodology ACM0008 (Version 08.0)	Criteria fulfilled	Determination by the validation team
prior to the start of project. (b) Only pre-mining drainage from wells placed within the area to be mined are eligible for crediting. (c) For the calculation of emission reductions, all provisions for CBM should be followed for the open cast mine methane.		
The methodology does not apply to project activities with any of the following features: (a) Capture/use of virgin coal bed methane, e.g., methane extracted from coal seams for which there is no valid coal mining concession. (b) Use CO₂ or any other fluid/gas to enhance CBM drainage before mining takes place. (c) Methane extraction from abandoned mines that are flooded due to regulation;	☐ Yes ☐ No ☒ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that no virgin coal bed, CBM drainage, and abandoned coalmine are involved. Therefore, the criterion is not applicable.
The methodology does not apply to project activities that involve use and/or destruction of CBM or OCM if the baseline scenario identification resulted in partial use and/or destruction of CBM or OCM.	☐ Yes ☐ No ☒ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that no CBM or OCM use and/or destruction are involved. Therefore, the criterion is not applicable.
Emission reductions due to the use and/or destruction of CBM or OCM cannot be claimed if surface drainage to capture CBM or methane from open cast mine(s) is used within the project boundaries prior to the implementation of the project activity.	☐ Yes ☐ No ☒ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that the project doesn't involve the use or destruction of CVM or OCM. Therefore, the criterion is not applicable.

Applicability criteria of the Tool 02: "Combined tool to identify the baseline scenario and demonstrate additionality (version 07.0)"	Criteria fulfilled	Determination by the validation team
The tool is applicable to all types of proposed project activities. However, in some cases, methodologies referring to this tool may require adjustments or additional explanations as per the guidance in the respective methodologies. This could include, inter alia, a listing of relevant alternative scenarios that should be considered in Step 1, any relevant types of barriers other than those presented in this tool and guidance on how common practice should be established.	☒ Yes ☐ No ☐ N/A	The tool is applicable to all types of proposed project activities, and in section 5.1.1 of the applied methodology, it requires project proponents determine the most plausible baseline scenario through the use of the tool. Therefore, this criterion is applicable to the project activity.

Applicability criteria of Tool 05: "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0)"	Criteria fulfilled	Determination by the validation team
If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption: (a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; (b) Scenario B: Electricity consumption from	☒ Yes ☐ No ☐ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that that the project only use the electricity from grid (NCPG) when the project is out of operation or abnormal operation, which falls under scenario A. Therefore, the criterion is applicable.

Applicability criteria of Tool 05: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0)”	Criteria fulfilled	Determination by the validation team
(an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.		
This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: (a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.	☒ Yes ☐ No ☐ N/A	Through reviewing of the FSR/26/, FSR approval/27/, and onsite assessment, it is confirmed by the validation team that the electricity generated by the Project is delivered to NCPG (Scenario I). The criterion is applicable.
This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the	☐ Yes ☐ No	Through reviewing of the FSR/26/, FSR approval/27/, Grid connection approval /41/ and onsite assessment, the validation team confirmed that no captive

Applicability criteria of Tool 05: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0)”	Criteria fulfilled	Determination by the validation team
baseline scenario or to sources of leakage. The tool only accounts for CO ₂ emissions.	☒ N/A	renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage Therefore, this criterion is not applicable to the project activity.

Applicability criteria of Tool 07: “calculate the emission factor for an electricity system” (version 07.0)	Criteria fulfilled	Determination by the validation team
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).	☒ Yes ☐ No ☐ N/A	Through reviewing of the FSR/26/, FSR approval/27/, Grid connection approval /41/ and onsite assessment, the validation team confirmed that the Project utilizes the low concentration coal mine methane (CMM) from Liyang coal mine for power generation to supply electricity to NCPG. Therefore, the tool is applied to estimate the OM, BM and /or CM when calculating baseline emissions for the Project. Therefore, the criterion is applicable.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e., option II a and option IIb. If option II a is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be met. Namely, the	☒ Yes ☐ No ☐ N/A	Through reviewing of the FSR/26/, FSR approval/27/, Grid connection approval /41/ and onsite assessment, the validation team confirmed that emission factor for the project electricity system is calculated only for the grid power plants in China. The criterion is applicable.

Applicability criteria of Tool 07: “calculate the emission factor for an electricity system” (version 07.0)	Criteria fulfilled	Determination by the validation team
total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.		
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country	☒ Yes ☐ No ☐ N/A	The project electricity system is located in a non- Annex I country according to Grid Connection Approval of the project. /41/ Therefore, this criterion is applicable to the project activity.
Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	☒ Yes ☐ No ☐ N/A	The Project does not involve biofuels according to FSR /26/and project approval /27/. Therefore, this criterion is applicable to the project activity.

Applicability criteria of Tool 24: “common practice (version 03.1)”	Criteria fulfilled	Determination by the validation team
This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, or baseline and monitoring methodologies that use the common practice test for the	☒ Yes ☐ No ☐ N/A	As assessed above, the project applies the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality” for the demonstration of additionality, the project can use the common practice test for the demonstration of additionality. Hence this criterion is applicable for this

Applicability criteria of Tool 24: “common practice (version 03.1)”	Criteria fulfilled	Determination by the validation team
demonstration of additionality.		project activity.
In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	☒ Yes ☐ No ☐ N/A	Via checking the applied methodology, the validation team confirmed that the methodology defines approaches for the conduction of the common practice test that are same to those described in this methodological tool. Hence this criterion is applicable for this project activity.

Applicability criteria of Tool 27: “Investment analysis” (version 13.0)”	Criteria fulfilled	Determination by the validation team
This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, the guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities”, or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	☒ Yes ☐ No ☐ N/A	Since the Project activity is using “Combined tool to identify the baseline scenario and demonstrate additionality”, the tool is applicable by checking PD. Hence this criteria is applicable for this project activity.
In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	☒ Yes ☐ No ☐ N/A	The baseline and monitoring methodology only refers to “Combined tool to identify the baseline scenario and demonstrate additionality” for the investment analysis by verifying PD. Hence this criterion is applicable for this project activity.

The validation team hereby confirms that the selected methodologies and tools are approved CDM methodologies and tools, and are applicable to the project activity.

3.3.3 Project Boundary

The project boundary of the project has been assessed by means of on-site physical observation and documentation review. The project boundary is clearly defined as the physical and geographical boundary of the project facility and it is well defined in section 3.3 of the PD Version 04.1 of 30 August 2024/1/ according to ACM0008 (Version 08.0) Abatement of methane from coal mines/12/. The project boundary includes:

(a) The Liyang coal mine from where the methane is extracted; It is confirmed via site inspection and checking the FSR/26/ , Approval of project/27/ and Gas Cooperative Development and Utilization Agreement between Shanxi Shengdong Qingtian New Energy Co., Ltd. and Liyang Coal Mine/33/.

(b) There is no equipment installed for the CMM extraction, compression, and storage of methane and transport to an off-site user due to these devices owned by the coal mine and are used primarily to maintain underground mining safety, i.e. they were existed in the baseline which has been verified by site inspection and checking the Gas Cooperative Development and Utilization Agreement/33/.

(c) For the project, CMM delivery system, power generation units and waste heat recovery units are installed which has been verified by site inspection and checking the main Equipment purchase contract/34/ and Gas Cooperative Development and Utilization Agreement/33/.

(d) All the power plants connected to the NCPG which connected to NEPG and NWPG, thus power plants connected to NCPG, NEPG and NWPG are all included in the project boundary, which has been verified by site inspection and checking “2021 Baseline Emission Factors for Regional Power Grids in China” published by DNA of China/79/.

Via site inspection and checking the FSR /26/ and EIA /28/, it is verified that project boundary is clearly defined in the PD/1/ as per the methodology/12/.

The overview of emission sources are presented as below:

Table 3-1 Emission Sources Included in or Excluded from the Project Boundary

Emissions	Source	GHGs involved	Description
Baseline emissions	Methane emissions as a result of venting	CH ₄	Main emission source
	Electricity generation (electricity provided to the grid and/or to the captive user), heat and vehicle fuel use	CO ₂	Only CO ₂ emissions associated to the electricity generation replaced by the Project is counted
Project emissions	On-site electricity and fuel consumption due	CO ₂	CO ₂ emission from energy consumption of additional equipment

	to the project activity, including transport of the gas		required on top of what is required for purely drainage in the Project.
	Emission from methane destruction	CO ₂	CO ₂ emission from methane destruction in power plant
	Fugitive emission of unburned methane	CH ₄	Fugitive emissions of unburned methane

By means of on-site inspection and checking the FSR of the project/25/ and EIA/27/, the assessment team confirmed that GHG sources included and excluded from the project boundary is defined as correct and corresponding to the actual status of the project.

3.3.4 Baseline Scenario

The baseline of the Project is identified based on the approved consolidated baseline and monitoring methodology ACM0008 (Version 08.0), Abatement of methane from coal mines/12/.

The PD applies the stepwise approach as given by section 5.2 of the ACM0008 (Version 08.0)/12/ and "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 07.0)/13/.

Step 0. Demonstration that a proposed project activity is the first-of-its-kind.

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

Step 1: Identification of alternative scenarios

Step 1a: Define alternative scenarios to the proposed project

According to Tool 02 /13/, all alternative scenarios that provide the same output (service or product) as the proposed VCS project activity should be identified, the options were discussed in Step 1b of the report as below.

Step 1b: Consistency with mandatory applicable laws and regulations

According to ACM0008 (Version 08.0)/12/, the baseline scenario alternatives should include all feasible options to handle methane to comply with safety regulations. These alternatives may include, inter alia:

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

Assessment of Feasible Option Identification:

Since the project doesn't involve the utilization of CBM/OCM according to FSR /25/, Option A1 is excluded. Regarding Option A2, it is in compliance with legal and regulatory requirements to handle methane to comply with safety regulations. The latest version of national regulation of the coalmine safety "National Coalmine Safety Regulation (2016)"/38/ has been checked, the validation team confirmed that the it is not permitted to carry out pre-mining or post-mining extraction separately, the combination of the two methods must be adopted and based on the regulation to be in line with the rules to ensure safety regulation. Moreover, according to FSR /25/ and extraction station operation record /31/, the project doesn't involve the utilization of VAM as indicated in PD. Moreover, Liyang coal mine is not an abandoned mine according to FSR/26/, therefore, A3 and A4 is excluded.

In conclusion, as Option A1, Option A3 and Option A4 are excluded. Option A5 is Option A2, is in compliance with legal and regulatory requirements to handle methane to comply with safety regulations.

The baseline scenario alternatives should include all feasible options to deal with methane. These options could include:

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

Assessment of Feasible Option Identification

According to "National Coalmine Safety Regulation (2016)"/38/, flaring of methane with direct combustion of methane concentration of below 30% is prohibited. Therefore, Option B2 is eliminated. According to FSR and checked the CMM concentration record at the time of onsite inspection, the validation team could confirm that the CMM concentration utilized is below 30%, and with average 16%.

According to Article 497 of "National Coalmine Safety Regulation (2016)"/38/, low concentration CMM research by research report from IEA and Journal of coal mine production safety/49//50/, it could be verified by the validation team that the extracted CMM must be purified to achieve a high methane concentration (95%) and then transported to users or to factories through a high-pressure gas pipeline network, however, the purification process is complicated and economically expensive, therefore, the methane treatment as vehicle fuel or gas production will be excluded due to uneconomically.

Low-concentration gas cannot be used for direct heat generation according to onsite inspection. The project utilizes the waste heat from gas generation units to provide heating to the coal mine. Therefore, option B3 use of methane for heat generation is excluded.

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

In conclusion, options B1 venting of methane and B3 use of methane for electricity generation are the applicable scenarios in compliance with legal and regulatory requirements.

Options for energy production

All possible options to generate electricity at the coal mines in the project include:

- (P1) Equivalent quantity of electricity supply from NCPG;
- (P2) The proposed project activity not undertaken as a VCS project activity;
- (P3) Construction of a fossil fuel-fired power plant with equivalent power supply;
- (P4) Power generation using renewable energy resources e.g., hydro, solar or wind power.

Assessment of Feasible Option Identification:

Via site inspection and checking the FSR/26/, it is confirmed that the installed capacity of the project is 15 MW CMM-fired power plant. Hence, alternative P3 is eliminated which is validated to be consistent with the Chinese regulation:

- “Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135 MW or Below” issued by the General Office of the State Council, decree no. 2002-6 /51/, stipulating the prohibition of the construction of coal-fired power plants with an installed unit capacity equal to or lower than 135 MW in the areas which can be covered by large grids such as provincial grids.
- As stipulated by “Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators” /65/, Fuel-fired (fossil fuel including coal, oil and gas) power plants with an installed capacity of less than 100MW are strictly restricted for construction and fuel-fired (including coal, oil and gas) power plants with an installed capacity of less than 25MW are strictly prohibited., however, CMM power plants are encouraged to construction in the regulation.
- According to ‘Emission standard of coalbed methane/coal mine gas (on trial)’(GB21522-2008)/66/, only the CMM with the concentration higher than 30% should directly utilized. The project activity is not mandated by any law, statute, or other regulatory framework.

To sum up, the validation team confirmed that the fossil fuel power plant below 25MW, which includes coal, oil and gas is strictly prohibited, but CMM power plant is encouraged according to ‘Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators’ issued in August 1997, hence the baseline alternative P3 can be eliminated with the regulation.

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

To sum up, based on above justification, the baseline alternative options that are technically feasible and comply with all legal and regulatory requirements are listed below:

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

Step 2: Barrier analysis

Step 2a: Identify barriers that would prevent the implementation of alternative scenarios

For scenario 1, this is the continuation of business-as-usual faces no barrier. It remains as a possible baseline scenario alternative for this step.

For scenario 2, it is verified that this scenario is a conflicted scenario for methane treatment and utilization.

For scenario 3 which involves power generation using renewable energy resources e.g. hydro, solar or wind power is eliminated as below reason:

There is no good resources for hydropower, and geothermal resources and uneconomically for wind power and solar power in the mining area /52//53//54/, moreover, which has been confirmed by site inspection and interview with local officers.

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

For Scenario 4, this is a conflicted scenario for use of methane for electricity production against equivalent quantity of electricity supply from NCPG.

For Scenario 5: This is the project activity not implemented as a VCS project. This scenario confronts investment barriers, which will be discussed in below section.

For Scenario 6: The same is as scenario 3. The electricity generation using renewable energy sources in local area is facing kinds of barrier.

Step 2b: Eliminate alternative scenarios which are prevented by the identified barriers

According to above identification, scenarios 2, 3, 4 and 6 are excluded.

As detailed in the PD, there are no technology barriers, acceptability barriers and financial barriers that may prevent these two alternative scenarios to occur.

Scenario ID	CMM extraction	CMM treatment	Energy production
Scenario 1 (A2+B1+P1)	A2 Extraction of methane during and after the mining (CMM)	B1 Venting	P1 Equivalent quantity of electricity supply from NCPG
Scenario 5 (A2+B3+P2)	A2 Extraction of methane during and after the mining (CMM)	B3 Use of methane for electricity production	P2 The Project activity not undertaken as a VCS project activity.

Outcome of Step 2

There are still two alternative Scenario 1 and Scenario 5 remaining. Therefore, both alternatives come to Step 3.

3.3.5 Additionality

As indicated the timeline of milestones of the project in PD, and verified FSR/26/, Project approval/27/, EIA /28/, EIA approval/29/, Board meeting memo /32/, and the project completion acceptance report /30/, the validation team could confirm that the board meeting held on 19 August 2020 was held due to financial unattractive and decided to seek VCU revenues. The main equipment purchase contract issued on 21 February 2021/34/, the project starts to construct on 1 March 2021 according to the

project commencement order /35/, moreover, the project starts to operate on 1 March 2022 by verifying the project completion acceptance report/30/.

Step 3: Investment analysis

The purpose of this step is to compare both two alternative Scenario 1 and Scenario 5 to determine which one is economic attractive.

For each alternative, the investment analysis is illustrated in a transparent and complete manner according to the Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)/13/.

Choice of approach

The project activity generates financial benefits from CMM sales other than VCS related income, thus, simple cost analysis is not applicable for investment analysis for the project. Moreover, the baseline scenario identified as the continuous of the scenario prior to the implementation of the Project and involves no investment cost, so the investment comparison analysis is also not applicable for investment analysis for the project. The benchmark analysis is thus selected for conducting the investment analysis for the project.

Benchmark selection

The project IRR benchmark of 8% (post-tax project) is derived from the approved FSR/25/. The project FSR was approved by Development and Reform Commission of Shanxi Province on 12 July 2020. The project owner decided the project would be developed as VCS project on 19 August 2020. The interval of FSR completion and investment decision is short enough to ensure no material changes of the investment. Moreover, the authoritative reference of project IRR benchmark (post-tax) of 8% selected for the project, i.e. “Interim Rules on Economic Assessment Electrical Engineering Retrofit Projects”/56/ has been reviewed by the validation team. It can be identified that the economic benchmark of 8% (post- tax) is regulated for greenfield or retrofit projects in Chinese electric power industry. Therefore, the benchmark of 8%(post-tax) is reasonable and available at the time of investment decision.

Input parameters

It is confirmed by the validation team that the FSR has been the basis of the decision to proceed with the investment in the Project. All the input parameters used in the financial analysis of the project are sourced from the FSR developed by Henan Qiyuan Electric Power Survey and Design Co., Ltd /25/. The Project was approved by Development and Reform Commission of Shanxi Province /26/. Therefore, all the input parameters used in the financial analysis of the project can be assessed as information provided by an independent and recognized source.

The validation team has verified the data parameters compared with FSR /25/, and confirmed that the input values are in line with addressed in FSR/25/. Detailed assessments on all input parameters used in the investment analysis by the validation team are presented in the context below.

Item	Unit	Value	Source
Installed capacity	MW	15	FSR/25/
Total static investment	10,000CNY	9,942.1	FSR/25/
Working capital	10,000CNY	45.0	FSR/25/
Annual electricity generation	MWh/year	82,500	FSR/25/
Annual electricity exported	MWh/year	77,550	FSR/25/
Plant load factor	%	62.79	FSR/25/
Electricity Tariff (including VAT)	CNY/kWh	0.509	FSR/25/
Heat income	10,000CNY	200 annual under total capacity of 15MW	FSR/25/ and Gas Cooperative Development Utilization Ag and reement /33/
Power self-consumption ratio	%	6	FSR/25/
Income tax	%	25	FSR/25/, which is sourced from Notice on the adjustment of the value-added tax rate for power grid enterprises and the corresponding reduction of general industrial and commercial electricity prices issued in 2019 /57/. According to Provisional Regulations of the People's Republic of China on Value Added Tax from State Council issued on 10 November 2008 and implemented from 1 January 2009 /58/ and FSR/25/, the equipment VAT can be refund over the operation period against the tariff VAT until the VAT from the equipment VAT is fully recovered.
Value added tax (Electricity)	%	13	
Municipal maintenance and construction tax	% of VAT	7	
Surcharge for education	% of VAT	5	
Depreciation period	Year	10	FSR/25/
Scrap value of fixed assets	%	5	FSR/25/
Annual operation and management (O&M) cost	10,000CNY	2,631.4	FSR/25/

Project operational lifetime	Year	10	FSR/25/
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Financial calculation and conclusion

The financial analysis is in accordance with the Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)/13/. All input parameters used in the IRR calculation were valid at the time of investment decision making. The calculation formula and calculation process of the value of IRR in the calculation sheet/3/ was verified and confirmed that the calculation process and input value are correct. The validation team confirms that the project IRR post-tax without any VCS revenue works out to be 3.93% which is below benchmark of 8%. It is clearly demonstrated that the proposed project activity without VCS revenues is financially unattractive.

Item	Without income from VCUs	Benchmark IRR	With income from VCUs
The Project IRR(post-tax)	3.93%	8%	9.55%

Sensitivity analysis

Furthermore, a sensitivity analysis has been provided in the PD and the calculation sheet/3/. The analysis is assessed as follow,

According to Tool 27 on Investment Analysis (Version 12.0) /17/, the variables, including the initial investment cost, that constitute more than 20% of either total project cost or total project revenues should be subject to reasonable variation. In the projects, the reasonable variations including the total static investment, annual operational and maintenance (O&M) costs, electricity tariff and annual electricity exported were verified by assessment team as constitutes more than 20% of total project costs. Moreover, considering heat income is considered as the variables due to material impact although it is less than 20% of either total project cost or total project revenues.

Via checking the sensitivity analysis for these four critical parameters as provided in PD /1/ and the calculation sheet/3/, The assessment team verified that the IRR value for the proposed project are all lower than the benchmark by varying $\pm 10\%$ of three critical parameters. Moreover, reasonable variations of the total static investment, annual operational and maintenance (O&M) costs, electricity tariff and annual electricity exported were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

Total static investment: If the total investments decrease by 22.09%, the project-IRR will reach the benchmark of 8%. The validation team was able to confirm that from 2017 to 2021, the year-on-year growth rate of the total investment in fixed assets was 4.9%, 2.7%, 5.1%, 5.9%, and 6.2%, respectively based on the information from National Bureau of Statistics /69/. In addition, since the project of the

capacity of 12MW has been operated in the period of validation, according to the main equipment contract/34/, the actual investment is 81,730,000RMB, 82.2% of the total static investment, even the the actual investment is used for IRR calculation, it is unlikely to reach benchmark with 8%. Therefore, the validation team confirmed that the estimated value in FSR /25/ is reasonable and conservative.

Annual O&M cost: By reducing the O & M cost by 13.52%, the project-IRR reaches the benchmark. Since Purchasing Price Indices for Industrial Producers are fluctuate within 10.7% in recent five years (104.1, 99.3, 97.7, 111.0 and 106.1) and average employment wages index in electricity generation and supply industry is 125,332CNY/year /69/, which is higher than the estimated salary for the project in FSR with 80,000 CNY/year, moreover, according to 2022 National Bureau of Statistics /69/, the employment salary is fluctuate increasing, therefore, the estimated value in FSR is conservative. Furthermore, the maintenance cost is increasing in the past years due to equipment abrasion.

Moreover, according to VCS website, the comparison of the O&M cost between the proposed project and the registered project under the same year of the project start date is indicated in PD, the validation team confirmed that the O&M per unit of capacity of the proposed project with CNY 175.43×10^4 /MW is within the registered project between 112.53×10^4 /MW and 175.85×10^4 /MW as indicated in PD.

The validation team validated 2023 financial statement /80/ provided by the project owner, the actual O&M cost of the project in 2023 was 2,368.3 (10,000 RMB) with 12MW. The project currently only has 12MW installed in 2023, and remaining 20% is expected to be installed by March 2025. Therefore, it can be inferred that the O&M cost is 2,841(10,000 RMB) in case the project installed capacity reaches 15MW as designed in the FSR /25/, which is 7.9% higher than the annual O&M cost estimated during the FSR stage (2,631.4 (10,000 RMB)) with 15MW.

Therefore, this is unreasonable to decrease by 13.52% to reach benchmark.

Annual electricity tariff: By increasing the electricity tariff by 9.17% with 0.556 CNY/kWh (incl.VAT), the project-IRR reaches the benchmark. The estimated tariff with 0.509 CNY/kWh (incl.VAT) is sourced from FSR /25/, which is based on the "Notice on the Benchmark On-grid Electricity Tariff for Coal Mine Methane Power Generation," /59/ published by Shanxi Development and Reform Commission (SDRC) in October 2017, however, "Regarding the Refinement of Our Province's On-grid Tariff Policy for Methane Power Generation" /60/ was issued by Shanxi Development and Reform Commission (SDRC) and stated that the on-grid tariff in Shanxi Province is adjusted to 0.4048 CNY/kWh (incl.VAT) since 1 May 2021, both documents were verified by validation team and confirmed.

Moreover, the electricity sale receipt of the project in January 2023 /61/ was verified and confirmed that the actual electricity tariff is 0.4048 CNY/kWh, which is 20.27% lower than the estimated electricity tariff estimated in FSR /25/.

Therefore, it is unlikely to increase the electricity tariff by 9.17% to reach benchmark.

Annual electricity exported: The annual electricity exported increased by 9.17%, the project IRR reaches the benchmark. The estimated electricity generation annually is sourced from FSR, which is designed

by a third qualified party with Henan Qiyuan Electric Power Survey and Design Co., Ltd /25/ based on 1) generator performance and 2) availability and stability of CMM supply. Moreover, the gas generators contract /34/ was verified by validation team and the nameplate was inspected on-site, and confirmed that the unit capacity is the same as indicated in FSR, the annual electricity generation was determined by FSR with actual situation, and then the electricity sales receipt from March 2022 to February 2023 /81/, and confirmed that the electricity exported in the year is 60,580MWh, which is lower 21.88% than the electricity with 77,550 MWh estimated in FSR (Note: The estimated electricity is the value deducted auxiliary power plant consumption rate and line loss rate $82,500\text{MWh} \times (1-6\%) = 77,550\text{MWh}$). By interviewing with the staff of the project, it could be confirmed that the reason is gas unstable, and some of the gas generators will only run at partial loads, essentially reducing the effective operation hour.

Therefore, it is unlikely to increase 9.17% of the annual electricity exported to reach benchmark.

Heat income: By increasing the heat income by 165.21% up to 530 (10,000RMB) (without VAT), the project-IRR reaches the benchmark. The heat income is sourced from FSR /25/, and Gas Cooperative Development and Utilization Agreement issued on 10 January 2021 issued between Shanxi Shengdong Qingtian New Energy Co., Ltd. and Liyang Coal Mine /33/, and confirmed that the annual heat income is a fixed amount with 200 (10,000 RMB) under total capacity of 15MW per year. Therefore, with the installed capacity remaining unchanged, the heat income for the project is a fixed amount, and no adjustments are expected. Moreover, TUV Rheinland verified the actual heating cost settlement statement to the coal mine issued by the project owner for the period from April 15, 2022, to April 14, 2023, and confirmed that the heat income in the settlement for this year was 160 (10,000RMB), because the actual installed capacity of the project Phase 1 generator units accounted for 80% of the total. The heat income was prorated based on the actual installed capacity, i.e., $2,000,000 \times 0.8 = 1,600,000$ RMB, reflecting a 20% reduction..

Therefore, it is unlikely to increase 165.21% of the heat income to reach benchmark.

In conclusion, the investment analysis and sensitivity analysis assessment has shown that the project activity is not financially attractive. Based above, it can confirm that the financial unattractiveness of the project is robust and thus the scenario (1) "A2+B1+P1" is the most economically attractive option and plausible baseline scenario.

CL 03, and CAR 05 were raised and successfully closed. Refer to Appendix 4 for detail assessment.

By means of comparison of the PD with "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 07.0)/13/, the validation team has assessed the additionality demonstration in accordance with applicable methodology and tool.

Step 1-3 of the tool were already done in section B.3.4 of PD for selection of alternative scenario 1 and confirmed by the validation team.

Then for the demonstration of additionality, the below step is assessed,

Step 4 Common practice analysis

The common practice analysis was checked strictly followed Methodological tool “Common practice” (Version 03.1)/17/.

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

For this project, the total installation capacity of the Project is 15 MW. Capacity range of +/- 50% is defined from 7.5 MW to 22.5 MW.

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

(a) The projects are located in the applicable geographical area,

Due to the differences of similar grid structure, development level, population size, industrial structure, fundamental infrastructure, strategic planning etc., the investment environment of each province in China varies widely. All of these factors can affect the final investment decision.

A province is the second administrative level of China after central Government and it is authorized to execute administrative examination and approval for construction projects considering local regulations based on local expertise of the assessment team.

In summary, the project within Shanxi Province is selected for the common practice analysis

(b) The projects apply the same measure as the proposed project activity,

Same measure is defined as: “Providing power generation based on CMM”

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity,

Project uses CMM.

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant,

Projects with electricity generation are chosen.

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1,

Out range: only projects have a capacity of 7.5MW - 22.5MW are chosen.

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

The main equipment purchase contract /34/ was signed on 21 February 2021, which is confirmed as the earliest date of the proposed project activity. Therefore, 21 February 2021 is selected as the scope of consideration for common practice.

The information source UNFCCC website /71/, China DNA's website, GS website/72/, VCS /73/ , and public available website /74/ for the common practice analysis is available and checked by the validation team. The information used is evaluated to be credible.

Via the source, validation team confirmed that there is one similar project identified in Shanxi Province based on the above criteria.

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

There is one similar project identified in Shanxi Province.

Hence $N_{all}=1$.

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

For the project, $N_{diff}=0$

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

Due to $N_{all}=1$, $N_{diff}=0$, therefore, $N_{all}-N_{diff}=1$, which is less than 3

$F=1-N_{diff}/N_{all}=1-0=1>0.2$

According to “Common practice (version 03.1)” /17/, the project activity is a “common practice” within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3. For the proposed project, although F is greater than 0.2, $N_{all}-N_{diff}$ is less than 3, thus it can be concluded that the project is not a common practice.

In conclusion, the project meets the criteria and tool “Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)”, thus deemed as additional.

3.3.6 Quantification of GHG Emission Reductions and Removals

The validation team has assessed all the calculations of baseline emissions and emission reductions in the PD/1/ against the information and requirements presented in the selected methodology ACM0008 (Version 08.0) Abatement of methane from coal mines/12/.

The emission reductions ER_y by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y), as follows:

Quantification of Baseline Emission

According to ACM0008 (Version 08.0)/12/, baseline emissions are determined in two steps:

Step A. Determination of methane eligible for crediting

According to FSR/25/ and EIA/26/, and interview with local staff in the project by on-site inspection, the validation team confirmed that CBM/COM/VAM/AMM is not applicable to the Project activity, only captured CMM is eligible for crediting.

Step B. Determination of baseline emissions

Baseline emissions would have occurred due to methane destruction, methane venting and use of other fossil fuels that are displaced by methane under the project activity. Baseline emissions due to venting should be discounted in case host country has regulations in place that are restricting the release of methane into the atmosphere.

$$BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y} \quad \text{Equation 1}$$

Where:

BE_y	Baseline emissions in year y (tCO ₂ e)
$BE_{MD,y}$	Baseline emissions from destruction of methane in the baseline scenario in year y (tCO ₂ e)
$BE_{MR,y}$	Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO ₂ e)
$BE_{Use,y}$	Baseline emissions from the production of power replaced by the project activity in year y (tCO ₂ e)

1. Methane destruction in the baseline

According to FSR/25/ and EIA/26/, and interview with local staff in the project by on-site inspection, the validation team confirmed that the baseline scenario does not involve any flaring or usage of CMM, therefore, there is no methane destruction in the baseline.

$$BE_{MD,y} = 0$$

2. Methane venting in the baseline

The amount of methane that would have been emitted to the atmosphere in the baseline scenario shall be determined as follows:

$$BE_{MR,y} = \sum_i \sum_s (MT_{PJ,s,i,y} - MT_{BL,s,i,y}) \times GWP_{CH4} \quad \text{Equation 2}$$

Where:

$BE_{MR,y}$	=	Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO ₂ e)
$MT_{PJ,s,i,y}$	=	Methane from source s captured and destroyed by use i in the project activity in year y (tCH ₄)
$MT_{BL,s,i,y}$	=	Methane from source s that would have been captured and destroyed by use i in the baseline scenario in the year y (tCH ₄)
i	=	Use of methane (flaring, power generation, etc.)
s	=	Source of methane that would have been captured, sent to and destroyed by use i in the baseline scenario in the year y. This may include eligible CBM, CMM, VAM, eligible AMM and eligible OCM
GWP_{CH4}	=	Global warming potential of methane (tCO ₂ e/tCH ₄)

Via on-site inspection and verifying the PD, it is confirmed that for this project, no CMM is captured and destructed under the baseline scenario. Hence, $MT_{BL,s,i,y}$ is 0 and actual value of $MT_{PJ,s,i,y}$ will be monitored. In the baseline scenario, there is no CMM captured and destroyed, thus $MT_{BL,s,i,y}$ is 0, thus:

$$BE_{MR,y} = \sum_i \sum_s MT_{PJ,s,i,y} \times GWP_{CH4} \quad \text{Equation 3}$$

Validation of ex- ante calculation of $BE_{MR,y}$

Parameters	Value	Data Source
GWP_{CH4}	28 tCO ₂ e/tCH ₄	IPCC Six Assessment Report /77/
$MT_{PJ,s,i,y}$	17,085tCH ₄	According to the FSR/25/ of the project, the estimated annual CMM measured sent to power plant will be 25.5 million Nm ³ CMM per year when the project is fully operated. The volume of CMM utilized by the project is estimated under the temperature of 293.15K, so the density of methane is 0.67kg/m ³ (2019 Refinement to 2006 IPCC). Therefore, the $MT_{PJ,s,i,y}$ is calculated as follows:

		$25.5 \times 10^6 \text{ m}^3 \times 0.67 \text{ kg/m}^3 / 1000 = 17,085 \text{ tCH}_4$
BE _{MRY}	478,380 CO _{2e}	Calculated with Equation 3.

3. Baseline emissions from the production of power, heat or vehicle fuels

The baseline emissions from displacement of power or heat generation, or supply of vehicle fuels are given by the following equation:

$$BE_{Use,y} = \sum_k (EG_{use,k,y} \times EF_{k,y}) \quad \text{Equation 4}$$

Where:

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

According to FSR/25/, EIA/26/ and inspected on-site, the assessment team confirmed that the waste heat from the generators of the project will be recovered by waste heat boilers to provide free hot water to the coal mines, which was provided by waste coal fired boilers before the implementation of the Project. However, to be conservative, emission reductions will not be claimed for this part. Moreover, the project does not involve emission reduction from supply of vehicle fuels. Thus, in this part, the project just involves the baseline emissions from the production of power.

Baseline emissions factor for power generation

According to the methodology ACM0008 (Version 08.0)/12/, the emission factor for displaced electricity is calculated as per the latest version of methodological tool 05 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Version 03.0)/14/. As per TOOL05, the parameter $EG_{use,k,y}$ is equivalent to the quantity of electricity generated and supplied by the project power plant to the grid in year y ($EG_{PJ,grid,y}$), which means a bidirectional electricity meter is installed to measure both electricity supplied by the project to the grid and the electricity consumed by the project from the grid. Therefore, $EG_{PJ,grid,y}$ equals to the difference between electricity supplied to the grid minus electricity provided by the grid. According to this tool, for the project is in the case of Scenario I: Electricity is supplied to the grid, the project participants choose Option A1: Calculate the combined margin emission factor of the applicable electricity system, using

the procedures in the latest approved version of the “Tool to calculate the emission factor for an electricity system” (Version 07.0) /15/ ($EF_{k,y} = EF_{grid,CM,y}$).

- Electricity of the Project is purchased from NCPG. In accordance with the delineation of the power grids, i.e. “2021 Baseline Emission Factors for Regional Power Grids in China issued by China DNA”/79/ issued on 17 November 2023, the NCPG is identified as the project electricity system of the project.
- $EF_{grid,CM,y}$ calculation from “2021 Baseline Emission Factors for Regional Power Grids in China” issued by China DNA”/79/ is based on the “Tool to calculate the emission factor for an electricity system”/15/, and referenced from China Energy Statistics Yearbook 2016-2020/64/ and China Electric Power Yearbook 2018-2020/63/,
- As a result, the BM emission factor calculated as 0.4701tCO_{2e}/MWh and the OM emission factor calculated as 0.9714tCO_{2e}/MWh from “2021 Baseline Emission Factors for Regional Power Grids in China” issued on 17 November 2023/79/ fully complies with the Tool 07 “Tool to calculate the emission factor for an electricity system” /15/.

The validation team confirmed that the Combined margin (CM) is calculated correctly as follows:

- The default weight of 50% OM and 50% BM for the project have been correctly selected and the Equation (11) in the PD is properly applied in the PD in accordance with the “Tool to calculate the emission factor for an electricity system” /15/.

In conclusion, the validation team can confirm that the $EF_{grid,CM,y}$ is appropriately calculated as 0.7207tCO_{2e}/MWh in the PD based on the most recent data available at the time of submission of the VCS PD to Verra for validation.

Validation of ex- ante calculation of $BE_{USE,y}$

Parameters	Value	Data Source
$EG_{use,k,y}$ ($EG_{PJ,grid,y}$)	77,550 MWh	FSR /25/
$EF_{k,y}$ ($EF_{grid,CM,y}$)	0.7207 tCO _{2e} /MWh	China DNA 2021 Baseline Emission Factors for Regional Power Grids in China/79/
BE_{MRy}	55,890 CO _{2e}	Calculated with Equation 4.

In conclusion, the validation team confirmed that the determination of baseline emission is appropriate and reasonable.

Quantification of Project Emission

According to ACM0008 (Version 08.0) /12/, Project emissions comprise the following sources:

- Emissions from the energy use to capture and use methane;

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

Project emissions are defined by the following equation:

$$PE_y = PE_{ME,y} + PE_{MD,y} + PE_{UM,y} \quad \text{Equation 5}$$

Where:

PE_y	=	Project emissions in year y (tCO ₂ e)
$PE_{ME,y}$	=	Project emissions from energy use to capture and use methane (tCO ₂ e)
$PE_{MD,y}$	=	Project emissions from destruction of captured methane (tCO ₂ e)
$PE_{UM,y}$	=	Project emissions from un-combusted methane in year y (tCO ₂ e)

1. Project emissions from the energy use to capture and to use methane.

By checking the FSR /25/ and through site visit, the assessment team confirmed that during the normal operation of the project activity, the additional electricity consumption required by the project activity to capture and utilize the CMM is supplied by the power generation of the project; Only when the project is out of operation or abnormal operation, there is a small amount of power consumed. According to ACM0008 (Version 08.0)/12/, emissions due to electricity consumption should be determined using the latest version of the Tool 05 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /14/should be used.

$$PE_{ME,y} = PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EF,j,y} \times (1 + TDL_{j,y}) \quad \text{Equation 6}$$

Where:

$PE_{EC,y}$	=	Project emissions from electricity consumption in year y (tCO ₂ /yr)
$EC_{PJ,j,y}$	=	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
$EF_{EF,j,y}$	=	Emission factor for electricity generation for source j in year y (tCO ₂ /MWh)

$TDL_{j,y}$	=	Average technical transmission and distribution losses for providing electricity to source j in year y
j	=	Sources of electricity consumption in the project

According to “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0), $EF_{EF,j,y}=EF_{grid,CM,y}$.

Parameters	Value	Data Source
$EC_{PJ,j,y}$	0MWh	This parameter is ex ante determined as 0 and will be monitored ex post.
$TDL_{j,y}$	20%	According to the tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /14/, 20% was applied.
$EF_{EF,j,y}$	0.7207tCO _{2e} /MWh	2021 Baseline Emission Factors for Regional Power Grids in China /79/and Tool 07: “Tool to calculate the emission factor for an electricity system”/15/
$PE_{ME,y}$	0 tCO _{2e}	Calculated with Equation 6 of the report

2. Project emissions from destruction of captured methane

When the captured methane is burned in a flare, power plant, or oxidized in a flameless oxidation unit, combustion emissions are released.

$$PE_{MD,y} = \sum_i MD_{i,y} \times CEF_{CH_4} \quad \text{Equation 7}$$

Where:

PE_{MD}	=	Project emissions from methane destroyed (tCO _{2e})
$MD_{i,y}$	=	Methane destroyed through use i (tCH ₄)
i	=	Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses)

CEF_{CH_4} = Carbon emission factor for combusted methane. Set as 2.75 (tCO₂/tCH₄)

As mentioned above, since emission reductions will not be claimed in heat generation. And for the project is not involved emission reduction from supply of vehicle fuels. The project only involves in methane destroyed through power generation.

$$PE_{MD,y} = MD_{ELEC,y} \times CEF_{CH_4} \quad \text{Equation 8}$$

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

$$MD_{i,y} = MM_{i,y} \times Eff_{i,y} \quad \text{Equation 9}$$

Where:

$MD_{i,y}$ = Methane destroyed through use i in year y (tCH₄)

$MM_{i,y}$ = Methane measured sent to use i in year y (tCH₄)

$Eff_{i,y}$ = Efficiency of methane destruction in use i in year y (%)

Thus:

$$PE_{MD,y} = MM_{ELEC,y} \times Eff_{ELEC,y} \times CEF_{CH_4} \quad \text{Equation 10}$$

Where:

$MD_{ELEC,y}$ = Methane destroyed through use of power generation in year y (tCH₄)

$MM_{ELEC,y}$ = Methane measured sent to use of power generation in year y (tCH₄)

$Eff_{ELEC,y}$ = Efficiency of methane destruction in using of power generation in year y (%)

The parameters used to calculate $PE_{MD,y}$ ex-ante is determined and justified as below:

Parameters	Value	Data Source
$MD_{ELEC,y}$	17,085tCH ₄	The data comes from the same source as $MT_{PJ,s,i,y}$.

$Eff_{ELEC,y}$	99.5%	2019 Refinement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories
CE_{CH_4}	2.75 tCO ₂ /tCH ₄	ACM0008 (Version 08.0)/12/
$PE_{MD,y}$	46,749tCO _{2e}	Calculated with Equation 10 of the report

3. Project emissions from un-combusted methane

According to ACM0008 (Version 08.0)/12/, not all the methane sent to the flare, to the flameless oxidizer or used to generate power and heat will be combusted, so a small amount will be released to the atmosphere. These emissions are calculated as follows:

$$PE_{UM,y} = GWP_{CH_4} \times \sum_i MM_{i,y} \times (1 - Eff_{i,y}) \quad \text{Equation 11}$$

Where:

$PE_{UM,y}$	=	Project emissions from un-combusted methane (tCO _{2e})
GWP_{CH_4}	=	Global warming potential of methane (tCO _{2e} /tCH ₄)
i	=	Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses)
$MM_{i,y}$	=	Methane measured sent to use i in year y (tCH ₄)
$Eff_{i,y}$	=	Efficiency of methane destruction in use i in year y (%)

For the Project:

$$PE_{UM,y} = GWP_{CH_4} \times MM_{ELEC,y} \times (1 - Eff_{i,y}) \quad \text{Equation 12}$$

The parameters used to calculate $PE_{UM,y}$ ex-ante is determined and justified as below:

Parameters	Value	Data Source
$MM_{ELEC,y}$	17,085tCH ₄	The data comes from the same source as $MT_{PJ,s,i,y}$.
$Eff_{ELEC,y}$	99.5%	2019 Refinement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories

GWP _{CH4}	28 tCO ₂ /tCH ₄	ACM0008 (Version 08.0)/12/
PE _{UM,y}	2,392tCO _{2e}	Calculated with Equation 12 of the report

In conclusion, the validation team confirmed that the determination of PE_y is appropriate and reasonable.

Leakage

As per the applied methodology /12/, FSR /25/, PD, and on-site inspection, it is verified that there is no thermal energy use involved in the baseline scenario of the project, hence leakage (LE_y) during this monitoring period is 0.

$$LE_{AD,y} = 0$$

Emission Reductions

$$ER_y = BE_y - PE_y - LE_y \quad (\text{Equation 25})$$

Where:

ER_y = Emission reductions in year y (t CO_{2e}/yr).

BE_y = Baseline emissions in year y (t CO_{2e}/yr).

PE_y = Project emissions in year y (t CO₂/yr).

LE_y = Leakage emissions in year y (t CO₂/yr)

The emission reductions can be obtained from the equation below:

$$ER_y = BE_y - PE_y - LE_y = 534,270 \text{ tCO}_2e - 49,141 \text{ tCO}_2e - 0 \text{ tCO}_2e = 485,129 \text{ tCO}_2e$$

Thus, the estimated emission reduction is summarized as follows:

Year	Estimated baseline emissions or removals (tCO _{2e})	Estimated project emissions or removals (tCO _{2e})	Estimated leakage emissions (tCO _{2e})	Estimated net GHG emission reductions or removals (tCO _{2e})
01-March-2022 to	427,416	39,314	0	388,102

28-February-2023				
01-March-2023 to 29-February-2024	427,416	39,314	0	388,102
01-March-2024 to 28-February-2025	427,416	39,314	0	388,102
01-March-2025 to 28-February-2026	534,270	49,141	0	485,129
01-March-2026 to 28-February-2027	534,270	49,141	0	485,129
01-March-2027 to 29-February-2028	534,270	49,141	0	485,129
01-March-2028 to 28-February-2029	534,270	49,141	0	485,129
01-March-2029 to 28-February-	534,270	49,141	0	485,129

2030				
01-March-2030 to 28-February-2031	534,270	49,141	0	485,129
01-March-2031 to 29-February-2032	534,270	49,141	0	485,129
Total	5,022,138	461,929	0	4,560,209

In summary, the calculation of emission reductions was correctly demonstrated by the PP according to the methodology ACM0008 (Version 08.0)/12/. The table below summaries validation team's determination of emission reduction:

All assumptions made for estimating GHG are listed in the PD	☒ Yes ☐ No	All the assumptions made for estimating GHG have been confirmed listed in the section 4 and 5 of PD. The main assumptions are in line with project situation in FSR /25/, the methodology, relevant Tools mentioned as above, IPCC /78/ and 2021 Baseline Emission Factors for Regional Power Grids in China /79/.
All data used by project participants are listed in the PD	☒ Yes ☐ No	All data used by the project participants have been confirmed listed according to the FSR of the project.
Formulas, parameters, values are complete, accurate, transparent and conservative	☒ Yes ☐ No	Formulas, parameters, values have been confirmed completely, accurately, transparently and conservatively documented in the PD Section B.4 according to ACM0008 (Version 08.0)/12/.
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	☒ Yes ☐ No	All the references and documents used have been correctly quoted and conservatively interpreted in the PD Section B.4 according to the FSR of the project.
Methodology has been applied correctly to	☒ Yes	The methodology (i.e. ACM0008 (Version 08.0))

calculate project emissions, baseline emissions, leakage emissions and emission reductions	☐ No	has been correctly applied to calculate project emissions, baseline emissions, leakage emissions and emission reductions. Please also see above descriptions in this section.
All the emissions of baseline emissions can be replicated using information provided in the PDD	☒ Yes ☐ No	All the emissions of baseline emissions can be replicated as per the description above.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 4,560,209 tCO₂e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PD. All values used in the PD are considered reasonable and conservative in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PD.

CAR 04 and CAR 06 was raised and successfully closed. Refer to Appendix 4 for detail assessment.

3.3.7 Methodology Deviations

There are no any methodology deviations applied to the project.

3.3.8 Monitoring Plan

The project applies the approved monitoring methodology ACM0008 (Version 08.0): Abatement of methane from coal mines. The selected monitoring methodology is applicable for the project. The monitoring plan is in accordance with the monitoring methodologies. The monitoring plan will give opportunity for real measurements of achieved emission reductions and contains principles and concepts on which it is based, operational and monitoring obligations of the project owner like resources involved in the monitoring process, training, support activities, calibration and data collection, quality assurance procedures, data management, electronic support tools.

Data and Parameters Available at Validation:

Data / Parameter:	$MT_{BL,s,i,y}$
Data Unit:	tCH ₄
Description:	Methane from source s that would have been captured and destroyed by use i in the baseline scenario in the year y
Source of data used:	As clarified in section 3.3.4 of the report, there is no CMM captured in the baseline scenario.
Value applied:	0

Data / Parameter:	CEF_{CH_4}
Data Unit:	tCO ₂ e/tCH ₄
Description:	Carbon emission factor for combusted methane
Source of data used:	ACM0008 (Version 08.0)
Value applied:	2.75

Data / Parameter:	D _{CH₄}
Data Unit:	kg/m ³
Description:	Density of methane under normal conditions of temperature and pressure
Source of data used:	ACM0008 (Version 08.0)
Value applied:	0.67kg/m ³ under Normal conditions of temperature and pressure are defined as 1 atm and 293.15K.

Data / Parameter:	$TDL_{j,y}$
Data Unit:	%
Description:	Average technical transmission and distribution losses for providing electricity to source j in year y
Source of data used:	Tool 05 "Baseline, project and/or leakage emissions"

	from electricity consumption and monitoring of electricity generation" (v03.0)
Value applied:	20% According to Tool 05 /14/, the value with 20% is applied. Via verified FSR /25/and Grid Connection Approval /41/, the electricity consumption by all project and leakage from the grid is 0 as ex-ante value, which is smaller than the electricity consumption of all baseline sources from the grid with 77,550MWh, therefore, the selected value with 20% is reasonable.

Data / Parameter:	$EF_{k,y} (EF_{grid,CM,y})$
Data Unit:	tCO ₂ /MWh
Description:	Combined margin emission factor for the grid in year y
Source of data used:	"2021 Baseline Emission Factors for Regional Power Grids in China" published by DNA of China <i>issued on 17 November 2023 /79/</i>. EF_{OM}: 0.9714tCO_{2e}/MWh EF_{BM}: 0.4701 tCO_{2e}/MWh According to Tool 07 Tool to calculate the emission factor for an electricity system (Version 07.0) /15/, refer to all other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool. EF_{grid, CM, y}=0.9714 tCO₂/MWh *0.5+0.4701 tCO₂/MWh *0.5 = 0.7207 (tCO₂/MWh)

Value applied:	0.7207
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Data and Parameters Monitored

Data / Parameter:	$MT_{PJ,s,i,y}$
Data Unit:	tCH ₄
Description:	Methane from source s captured and destroyed by use i in the project activity in year y
Monitoring procedure:	1. The ex-ante value is from FSR /25/; 2. Ex-ante value is 17,085tCH₄; 3. $MT_{PJ,s,i,y}$ is calculated by the gas flow rate, pressure, temperature and CH₄ concentration of CMM; 4. Flow meters, thermometers, manometers and gas analyzer is installed in the place where Figure 5-1 of PD is indicated; 5. The meters are continuously measured; calibrated annually in compliance with Industry standard, the accuracy of these equipment also meet the requirements of relevant legal regulations; 6. All electronic data and paper documents must be archived and kept for at least two years after the end of the project crediting period; 7. The volume unit monitored by the meters could be converted to mass unit with density of methane.

Data / Parameter:	$MM_{ELEC,y}$
Data Unit:	t CH ₄
Description:	Methane measured sent to use of power generation in year y
Monitoring procedure:	The ex-ante value and monitoring procedure is the same as $MT_{PJ,s,i,y}$

Data / Parameter:	GWP_{CH_4}
Data Unit:	tCO_2e/tCH_4
Description:	Global warming potential of methane
Monitoring procedure:	1. Ex-ante value is $28tCO_2e/tCH_4$; 2. The value was sourced from IPCC Fifth Assessment Report (AR5) 3. The parameter will be updated according to the relevant documents.

Data / Parameter:	$EG_{use,k,y}(EG_{PJ,grid,y})$
Data Unit:	MWh
Description:	Energy of type k displaced by the project activity in year y
Monitoring procedure:	1. The ex-ante value is from FSR /25/; 2. Ex-ante value is 77,550MWh; 3. $EG_{use,k,y}$ is calculated by bidirectional electricity meter; 4. The meter is installed in the place where Figure 5-1 of PD is indicated; 5. The meters are continuously measured; calibrated annually in compliance with Industry standard, the accuracy of these equipment also meet the requirements of relevant legal regulations; 6. All electronic data and paper documents must be archived and kept for at least two years after the end of the project crediting period; 7. The data will be cross checked with Electricity Transaction Note

Data / Parameter:	$EC_{PJ,j,y}$
Data Unit:	MWh
Description:	Quantity of electricity consumed by the project electricity consumption

	source j in year y
Monitoring procedure:	1. The ex-ante value is from FSR /24/; 2. Ex-ante value is 0MWh; 3. Bidirectional electricity meter is applied to measure the amount of electricity exported by the project activity; 4. The monitoring procedure is the same as $EG_{use,k,y}$.

Data / Parameter:	$Eff_{i,y}(Eff_{ELEC,y})$
Data Unit:	%
Description:	Efficiency of methane destruction in use i (for the project, i represents power generation)
Monitoring procedure:	1. Ex-ante value is 99.5%, which is sourced from 2019 IPCC; 2. The parameter will be updated according to IPCC;

Monitoring plan

The following are included in the monitoring plan of the PD:

- Data and parameters to be monitored
- Management Structure;
- Data collection;
- Quality assurance;
- Emergency procedure
- Data file management

To the validation team's opinion, the detailed contents have been elaborated in the PD/1/. All archived data and documentation will be kept during the crediting period and two years after. Meter data measurements will be cross checked as per prescribed in PD. These will be maintained and implemented to enable subsequent verification of emission reductions. The project participant has the capability to implement the monitoring plan.

3.4 Non-Permanence Risk Analysis

N/A.

4 VALIDATION OPINION

TÜV RHEINLAND ENERGY & ENVIRONMENT GMBH, the VVB, has performed the Verified Carbon Standard (VCS) validation, “Liyang 15 MW Low-concentration CMM Power Generation Project ” VCS ID 4499 in P. R. China. with regard to the relevant requirements for VCS Standard Version 4.5. The project activity is designed to utilizes low concentration CMM (methane concentration lower than 30%) from Liyang coal mine for power generation and the generated electricity is supplied to the North China Power Grid (NCPG). Waste heat generated by the gas generators will be utilized for heat supply to the coal mine, which will displace the venting CMM and grid electricity imported from NCPG as business-as-usual scenario in the project area.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV Rheinland with sufficient evidence to determine the fulfilment of stated criteria.

In the course of the validation, 6 Corrective Action Requests (CARs) were raised and successfully closed. 4 Clarification Requests (CLs). No Forwarded Action Requests (FARs) was raised.

The review of the project design documentation and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided the assessment team with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarized as follows:

- the baseline scenario is correctly defined as per the applied methodology and relate tools;
- the project is additional;
- all data and information used for ex-ante calculation of emission reductions is of projected and/or hypothetical nature;
- a reasonable level of assurance has been applied.
- the monitoring plan in the PD is as per the applied methodology ACM0008 (Version 08.0);
- the project complies with the validation criteria for projects set out in VCS Version 4.4;
- The calculation of the ex-ante emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 4,560,209 tCO_{2e} are most likely to be achieved within the crediting period from 01 March 2022 to 29 February 2032.

It is TÜV Rheinland's responsibility to provide an independent validation statement on the Project's compliance with the VCS Program requirements as set out in the VCS Program Rules. The conclusions of this report show that the project, as it was described in the project description contained in the PD, is in line with all criteria applicable for the validation against the VCS Standard Version 4.5 without any qualifications or limitations.

TÜV Rheinland can confirm that the GHG emission reductions are calculated without material misstatements. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, TÜV Rheinland confirms the following statement:

Validated GHG emission reductions and removals in the crediting period from 01 March 2022 to 29 February 2032:

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
01-March-2022 to 28-February-2023	388,102
01-March-2023 to 29-February-2024	388,102
01-March-2024 to 28-February-2025	388,102
01-March-2025 to 28-February-2026	485,129
01-March-2026 to 28-February-2027	485,129
01-March-2027 to 29-February-2028	485,129
01-March-2028 to 28-February-2029	485,129
01-March-2029 to 28-February-2030	485,129
01-March-2030 to 28-February-2031	485,129
01-March-2031 to 29-February-2032	485,129
Total estimated ERs	4,560,209
Total number of crediting years	10
Average annual ERs	456,021

APPENDIX 1: ABBREVIATIONS

AMM	Abandoned Mine Methane
BE	Baseline Emissions
BM	Build Margin
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
DR	Document Review
EIA	Environmental Impact Assessment
ER	Emission Reduction
ETS	Emission Trading Scheme
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
kW	Kilo Watt
kWh	Kilo Watt Hours
LSC	Local Stakeholder Consultation
MoV	Means of Validation
NGO	Non-governmental Organization
NCPG	North China Power Grid
OCM	Open Cast Methane
ODA	Official Development Assistance
OM	Operating Margin
PD	Project Design
P. R. China	People's Republic of China
SD	Sustainable Development
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard

VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit
VVB	Validation/Verification Body
VVS	Validation and Verification Standard

APPENDIX 2: REFERENCE LIST

The following table outlines the documentation reviewed during the validation:

/1/	Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd., PD (version 02, 20/10/2023), and final PD Version 04.1 of 30 August 2024,;
/2/	Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd., Emission Reductions Calculation Spreadsheet;
/3/	Leon Low-Carbon and Environmental Protection Science and Technology (Beijing) Co., Ltd. Project IRR calculation spreadsheet
/4/	VERRA, VCS Standard Version 4.5, 4 October 2023;
/5/	VERRA, VCS Sectoral scope
/6/	VERRA, VCS Program Definition Version 4.4, 29 August 2023;
/7/	VERRA, VCS Registration and Issuance Process version 4.4 dated 4 October 2023;
/8/	VERRA, VCS Program Guide version 4.4 dated 29 August 2023;
/9/	VERRA, VCS Validation Report Template
/10/	VERRA, VCS PD Template Version 4.2.
/11/	CDM Executive Board, Clean Development Mechanism Validation and Verification Standard, version 07.0;
/12/	CDM Executive Board, ACM0008 (Version 08.0), Abatement of methane from coal mines;
/13/	CDM Executive Board, Tool 02 Combined tool to identify the baseline scenario and demonstrate additionality version 7.0 dated 22-Sep-2017;
/14/	CDM Executive Board, Tool 05 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 3.0 dated 22-Sep-2017;
/15/	CDM Executive Board, Tool 07 Tool to calculate the emission factor for an electricity system (Version 07.0) dated on 31 August 2018;
/16/	CDM Executive Board, CDM Executive Board, Standard Applicability of sectoral scopes version 01.0 dated 11-Mar-2016
/17/	CDM Executive Board, Tool 24 Common practice (Version 03.1) dated 28 May 2015;
/18/	CDM Executive Board, Tool 27 Investment Analysis (Version 13.0) dated 28 November 2023;
/19/	CDM Executive Board, Tool 27 Investment Analysis (Version 12.0) dated 2 November 2022.
/20/	IPCC 2006 Guidelines for National Greenhouse Gas Inventories;
/21/	CDM Executive Board, tool 27 Investment analysis version 12.0 dated 2 November 2022;
/22/	CDM Executive Board, Standard for Sampling and surveys for CDM project activities and programs of activities (Version 09.0)
/23/	Beijing Yonder Environmental Energy Technology Co., Ltd, Business license issued on 22 September 2021.
/24/	Shanxi Shengdong Qingtian New Energy Co., Ltd., Business license issued on 19 July 2021.

/25/	Henan Qiyuan Electric Power Survey and Design Co., Ltd, Feasibility Study Report (FSR) for the project issued on January 2019.
/26/	Development and Reform Commission of Shanxi Province, Project approval issued on 12 July 2020, JinFaGaiShenPiFa [2020] 466.
/27/	Shanxi Institute of Energy, EIA for Liyang 15 MW Low-concentration CMM Power Generation Project issued in June 2019.
/28/	Ecology and Environment Bureau of Jinzhong City, EIA approval for Liyang 15 MW Low-concentration CMM Power Generation Project issued on 10 July 2019, Shi Huan Han [2019] No 161.
/29/	Beijing Yonder Environmental Energy Technology Co., Ltd., Project activity statement
/30/	Shanxi Shengdong Qingtian New Energy Co., Ltd., The project completion acceptance report issued on 1 March 2022.
/31/	Liyang Coal Mine, Extraction station operation record
/32/	Beijing Yonder Environmental Energy Technology Co., Ltd Board meeting memo on 19 August 2020;
/33/	Shanxi Shengdong Qingtian New Energy Co., Ltd. and Liyang Coal Mine, Gas Cooperative Development and Utilization Agreement issued on 10 January 2021.
/34/	Manufacturers, The main equipment purchase contract of the project issued from 21 February 2021.
/35/	Shanxi Shengdong Qingtian New Energy Co., Ltd., the project commencement order issued on 1 March 2021.
/36/	Shanxi Shengdong Qingtian New Energy Co., Ltd., Labor contract
/37/	General Office of State Council, Several opinions of the General Office of the State Council on accelerating the extraction and utilization of coal mine gas (coal mine methane)
/38/	State Administration of Work Safety, Chinese National Coalmine Safety Regulation
/39/	NDRC, Notice of the National Development and Reform Commission on the issuance of the twelfth Five-Year Plan for The Development and Utilization of Coal Mine Gas (Coal Mine Methane)
/40/	State Grid Shanxi Jinzhong Electric Power Company, Power purchase agreement
/41/	State Grid Shanxi Electric Power Company, Grid connection approval for the project activity.
/42/	Ministry of Ecology and Environment of China, national emissions trading scheme, https://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html
/43/	Beijing Yonder Environmental Energy Technology Co., Ltd, Declaration of no double counting and Declaration of not involved in other GHG program.
/44/	National government, Environmental Protection Law of the People's Republic of China
/45/	National government, Administrative Licensing Law of the People's Republic of China
/46/	National government, Law of the People's Republic of China on Environmental Impact Assessment
/47/	National government, Regulations on Environmental Protection Management of Construction Projects

/48/	National Standard, Emission Standard of Noise at Boundary of Industrial Enterprises" (GB12348-2008)
/49/	IEA , Coal Mine Methane Emission Reduction, https://iea.blob.core.windows.net/assets/efa961c4-ac83-4a9c-88ee-62c0bd9ff2e9/DrivingDownCoalMineMethaneEmissions_Chinese.pdf
/50/	Journal for coal mine safety, Utilization research of current and future status for low concentration coal mine methane
/51/	the General Office of the State Council, Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135 MW or Below, Decree No. 2002-6
/52/	Public website, Current situation and optimal allocation strategy of water resources utilization in Jinzhong City of Shanxi Province, https://lib.cqvip.com/Qikan/Article/Detail?id=7104455777&from=Qikan_Search_Index
/53/	Public website, Discussion on geothermal resources and its exploitation and utilization model in Shanxi Province, http://journal25.magtechjournal.com/Jwk_dzdc/article/2018/2095-8706-5-5-13.html
/54/	China Energy Engineer Corporation Shanxi Brance , Distribution and Development of Wind and Solar resources in Shanxi Province ;
/55/	Urban gas specification, GB50028-93.
/56/	National Power Company, Interim Rules on Economic Assessment Electrical Engineering Retrofit Projects.
/57/	NDRC, Notice on the adjustment of the value-added tax rate for power grid enterprises and the corresponding reduction of general industrial and commercial electricity prices issued in 2019.
/58/	State Council, Provisional Regulations of the People's Republic of China on Value Added Tax issued on 10 November 2008 and implemented from 1 January 2009
/59/	Shanxi Development and Reform Commission (SDRC), Notice on the Benchmark On-grid Electricity Tariff for Coal Mine Methane Power Generation in October 2017
/60/	Shanxi Development and Reform Commission (SDRC), Regarding the Refinement of Our Province's On-grid Tariff Policy for Methane Power Generation In February 2021
/61/	State Grid Shanxi Jinzhong Company, electricity sales receipt of the project in January 2023
/62/	Public available website, https://news.bjx.com.cn/topics/wasifadian/ ; https://www.sohu.com/a/306098206_756343 ;
/63/	China Electricity Yearbook 2018-2020
/64/	China Energy Statistics Yearbook 2016-2020
/65/	Ministry of Water Resource and Electric Power of China, interim Rules on the Installation and Management of Small-scale Fuel-fired Generators
/66/	National Standard, Emission standard of coalbed methane/coal mine gas (on trial)'(GB21522-2008)
/67/	National Standard, DL/T448-2016 Technical Administrative Code of Electric Energy Metering
/68/	Beijing Yonder Environmental Energy Technology Co., Ltd, the Declaration of No Double Counting Statement

/69/	National Bureau of Statistics, Price index of investment in fixed asset, Purchasing price index for industrial producers and the Index of Average Wage of Urban Units Employment from 2017 to 2021.
/70/	Beijing Yonder Environmental Energy Technology Co., Ltd, 50 questionnaires
/71/	UNFCCC, http://cdm.unfccc.int/
/72/	GS, http://www.goldstandard.org/
/73/	VCS, https://verra.org/project/vcs-program/
/74/	Public website, https://news.bjx.com.cn/topics/wasifadian/
/75/	GHG Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting Standard, https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf
/76/	United Nations, SDG indicators
/77/	IPCC Six Assessment Report (AR6)
/78/	2019 IPCC, Guidelines for National Greenhouse Gas Inventories
/79/	China DNA, 2021 Baseline Emission Factors for Regional Power Grids in China issued on 17 November 2023. https://ccer.cets.org.cn/notice/noticeDetail?bulletinInfold=1175122354980917248
/80/	PP, 2023 financial statement
/81/	PP, Electricity sales receipt from March 2022 to March 2023.
/82/	PP, the heating cost settlement statement for the period from April 15, 2022, to April 14, 2023

APPENDIX 3: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. CLs from this validation

CL ID	01	Section no.	Section 1.1	Date: 03 December 2023
Description of CL				
Refer to section 1.1 of PD, please further clarify the description of project activity, e.g. the concentration of low CMM				
Project participant response				Date: 11 December 2023
The PD has been revised to further clarify the description of project activity. The purpose of the Project is to utilize the extracted CMM with a concentration less than 30% to produce electricity. According to FSR, the concentration of low CMM is expected to be around 16% under normal production conditions for the project.				
Documentation provided by project participant				
Liyang PD V.3.				
DOE assessment				Date: 03 January 2024
The validation team verified FSR, interviewed with staff in Liyang Coal Mine, and confirmed that the concentration of CMM with less than 30% indicated in PD is correct.				
Hence, the CL is closed.				

CL ID	02	Section no.	Section 1.17	Date: 03 December 2023
Description of CL				
According to PD template, further provide a brief description on how project activities will result in expected SD contributions with monitored data.				
Project participant response				Date: 11 December 2023

The PD has been revised to further provide a brief description on how project activities will result in expected SD contributions with monitored data.

For SDG7, the project will promote utilization of clean energy. After the full operation of the Project, the expected annual exported electricity will be 77,550 MWh, which will be supplied to the NCPG; For SDG8, the project will increase income of local residences and accelerate economy development in rural areas. 30 employment positions for local villagers have been provided, which increase income of local residences and accelerate economy development in rural areas.

Documentation provided by project participant

Liyang PD V.3.

DOE assessment

Date: 03 January 2024

The validation team verified the updated PD, and checked the relevant documents with FSR /25/ and labor contract /36/, and confirmed that the description for SD contribution is correct.

Hence, the CL is closed.

CL ID	03	Section no.	Section 3.5	Date: 03 December 2023
Description of CL				
Refer to investment analysis,				
1. Please breakdown O&M cost in IRR spreadsheet;				
2. Please provide evidence to cross check investment cost and electricity tariff.				
Project participant response				Date: 11 December 2023
The O&M cost has been breakdown in IRR calculation sheet. To cross check investment cost and electricity tariff, the Project contracts and electricity invoices in January 2023 have been provided.				
Documentation provided by project participant				
Liyang IRR calculation sheet				
Project contracts				
Electricity invoices				
DOE assessment				Date: 03 January 2024

1. The validation team confirmed that IRR spreadsheet was revised, and O&M was breakdown;
2. The main equipment purchases contract /34/ and electricity invoices /61/ has been verified by validation team.

Hence, the CL is closed.

CL ID	04	Section no.	Section 5.2 and 5.3	Date: 03 December 2023
Description of CL				
Refer to monitoring parameters, please address the monitoring meters installation, calibration frequency, accuracy and record frequency.				
Project participant response				Date: 11 December 2023
The PD has been revised. All monitoring meters are calibrated annually in compliance with Industry standard, The accuracy of these equipment also meet the requirements of relevant legal regulations. All electronic data and paper documents must be archived and kept for at least two years after the end of the project crediting period. The record frequency has been added in PD section 5.2.				
Documentation provided by project participant				
Liyang PD V.3.				
DOE assessment				Date: 03 January 2024
The monitoring meters installation is indicated in Figure 5-1 of PD, calibration frequency, accuracy and record frequency has also been indicated in section 5 of PD. Hence, the CL is closed.				

Table 2.CARs from this validation

CAR ID	01	Section no.	Section 1.5	Date: 03 December 2023
Description of CAR				
By on-site inspection and interview with local representatives, please further clarify the role of “Shanxi Shengdong Qingtian New Energy Co., Ltd.” in the project in section 1.6 of the project.				
Project participant response				Date: 11 December 2023

The PD has been revised to clarify “Shanxi Shengdong Qingtian New Energy Co., Ltd.” the role in the project in section 1.6.

Shanxi Shengdong Qingtian New Energy Co., Ltd. is Beijing Yonder Environmental Energy Technology Co., Ltd.’s fully subsidiary. Shanxi Shengdong Qingtian New Energy Co., Ltd. operates the Project.

Documentation provided by project participant

Liyang PD V.3.

DOE assessment

Date: 03 January 2024

Via interviewing with PP, and verifying Business license of Shanxi Shengdong Qingtian New Energy Co., Ltd., the validation team confirmed that Shanxi Shengdong Qingtian New Energy Co., Ltd. is operator of the project, which has been indicated in section 1.6 of the project.

Hence, the CAR is closed.

CAR ID	02	Section no.	Section 1.10and 1.11	Date: 03 December 2023
Description of CAR				
Via interview and onsite inspection, project activity was implemented in stages, Please further clarify it in sectio1.11 and consider the estimated ER annually based on the project activity.				
Project participant response				Date: 11 December 2023
The PD has been revised to clarify the actual construction status of the project activities in section 1.11. The estimated ER calculation based on the project activity has been added in ER calculation sheet.				
Documentation provided by project participant				
Liyang PD V.3.				
Liyang ER calculation sheet V.2.				
DOE assessment				Date: 03 January 2024
The validation team inspected on-site, interviewed with PP, and verified with the project owner’s statement /28/, and then confirmed that the clarification in section 1.11 of PD on project activity implementation in phase is in compliance with it.				
Hence, the CAR is closed.				

CAR ID	03	Section no.	Section 2.4	Date: 03 December 2023
Description of CAR				
Refer to section 2.4, please address it after public comment completion.				
Project participant response				Date: 11 December 2023
The PD has been revised and the public comments period has been added.				
Documentation provided by project participant				
Liyang PD V.3.				
DOE assessment				Date: 03 January 2024
The validation team confirmed that the section 2.4 of PD has been updated after public comment completion. Hence, the CAR is closed.				

CAR ID	04	Section no.	Section 3.3 and 4.2	Date: 03 December 2023
Description of CAR				
Please update emission factor (EF) based on the latest published by China DNA.				
Project participant response				Date: 11 December 2023
The PD and ER calculation sheet have been revised and the latest published emission factor has been updated.				
Documentation provided by project participant				
Liyang PD V.3. Liyang ER calculation sheet v.2.				
DOE assessment				Date: 03 January 2024
The validation team confirmed that the estimated ER has been updated according to the latest EF issued by China DNA. Hence, the CAR is closed.				

CAR ID	05	Section no.	Section 3.4	Date: 03 December 2023
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Description of CAR	
Refer to baseline scenario identification, 1. please further justify how to exclude option B3 on “use of methane for heat generation” . 2. Please provide evidence to further justify how to exclude scenario 3. 3. Please further clarify if there is CBM / OCM involved refer to option A1.	
Project participant response	Date: 11 December 2023
The PD has been revised to further justify how to exclude option B3 on “use of methane for heat generation” in section 3.4. Furthermore, more evidence has been provided to further justify how to exclude scenario 3 in PD section 3.4. According to FSR and onsite situation, the project doesn’t involve the utilization of CBM/OCM, Option A1 is excluded.	
Documentation provided by project participant	
Liyang PD V.3. Liyang FSR	
DOE assessment	Date: 03 January 2024
Refer to the CAR 1. The exclusion of option B3 is further clarified in the updated PD; 2. The relevant documents /52//53//54/ were provided to further justify the exclusion of scenario 3 in section 3.4 of PD; 3. According to FSR /25/, the project doesn’t involve the utilization of CBM/OCM. Hence, the CAR is closed.	

CAR ID	06	Section no.	Section 4.2	Date: 03 December 2023
Description of CAR				
Refer to Project emissions from the energy use to capture and to use methane, please further clarify it based on CDM Tool 05.				
Project participant response				Date: 11 December 2023
The PD and ER calculation sheet have been revised based on CDM TOOL 05.				
Documentation provided by project participant				

Liyang PD V.3.	
Liyang ER calculation sheet V.2.	
DOE assessment	Date: 03 January 2024
The validation team confirmed that the project emission calculation from the energy use to capture and to use methane was revised in section 4.2 of PD to be consistent with CDM Tool 05. Hence, the CAR is closed.	

Table 3.FARs from this validation

FAR ID	N/A	Section no.	N/A	Date: N/A
Description of FAR				
N/A				
Project participant response				Date: N/A
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				Date: N/A
N/A				

APPENDIX 4: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Ms. Liu Qing (Lily)

Certificate of competence

Personal details:

Name	QING	First name	Liu (Lily)
Date of birth	07.1971		
Organisational Unit	TUV Rheinland (China) Ltd., Person assigned to Validation and Verification Body (VVB) of TUV Rheinland Energy GmbH		
Languages	Chinese, English		

Sector	Scope of competence* under ISO 14064-2 and VCS
☒ 1	☒ Energy industries (renewable - / non-renewable sources) Qualification level: TE/VV/TL/TR
☒ 4	☒ Manufacturing Industries Qualification level: TE/VV/TL
☒ 8	☒ Mining/Mineral Production Qualification level: TE/VV/TL/TR
☒ 13	☒ Waste handling and disposal Qualification level: TE/VV/TL/TR

*Only appointed scopes are listed.

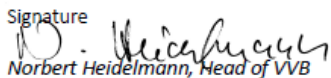
TE= Technical Expert
VV = Verification Validation
TL= Team Leader
TR = Technical Reviewer
TRA = Trainee

First Appointment	13 March 2023	Valid until	12 March 2024
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History of appointments

Date: 13 March 2023
Change (Type) 1st Appointment: TE, VV, TL, TR; Sector 1, 8, 13 (Competence)
By: Norbert Heidelmann

Date: 13 March 2023
Change (Type) 1st Appointment: TE, VV, TL; Sector 4 (Competence)
By: Norbert Heidelmann

Signature

Norbert Heidelmann, Head of VVB

Ms. Wang Guolian (Jessie)

Certificate of competence

Personal details:

Name	WANG	First name	Guolian (Jessie)
Date of birth	01.1978		
Organisational Unit	TUV Rheinland (China) Ltd., Person assigned to Validation and Verification Body (VVB) of TUV Rheinland Energy GmbH		
Languages	Chinese, English		

Sector	Scope of competence* under ISO 14064-2 and VCS	
☒ 1	☒ Energy industries (renewable - / non-renewable sources)	Qualification level: TE/VV/TR
☒ 4	☒ Manufacturing Industries	Qualification level: TE/VV/TL
☒ 5	☒ Chemical Industry	Qualification level: TE/VV/TR
☒ 8	☒ Mining/Mineral Production	Qualification level: TE/VV/TL
☒ 9	☒ Metal Production	Qualification level: TE/VV/TL
☒ 10	☒ Fugitive Emissions from Fuels (solid, oil and gas)	Qualification level: TE/VV/TL
☒ 14	☒ Agriculture, forestry and other land use (AFOLU)	Qualification level: TE/VV/TR

*Only appointed scopes are listed.

TE= Technical Expert
VV = Verification Validation
TL= Team Leader
TR = Technical Reviewer
TRA = Trainee

First Appointment	28 November 2022	Valid until	16 August 2024
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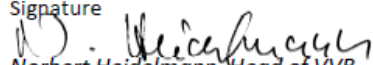
History of appointments

Date: 28 November 2022
Change (Type) 1st Appointment: TE, VV, TL; Sector(s) 1; 4; 5; 8; 9; 10; 14 (Competence)
By: Norbert Heidelbergmann

Date: 16 August 2023
Change (Type) Extension: TE, VV, TL; Sector(s) 1; 4; 5; 8; 9; 10; 14 (Competence), TR (14)
By: Norbert Heidelbergmann

Date: 17 August 2023
Change (Type) Extension: TR for Scopes 1 and 5
By: Norbert Heidelbergmann

Signature


Norbert Heidelbergmann, Head of VVB