



VCS VERIFICATION REPORT

HUINENG LOW CONCENTRATION COAL MINE METHANE UTILIZATION PROJECT

(VCS PROJECT ID: 2830)



Document Prepared By
Shenzhen CTI International Certification Co., Ltd

Project Title	Huineng Low Concentration Coal Mine Methane Utilization Project
Version	01.0
Report ID	CTI/NB-2022-0120-2

Report Title	VCS Verification Report of Huineng Low Concentration Coal Mine Methane Utilization Project
Client	Vitol (China) Energy Co., Ltd.

Pages	40
Date of Issue	26-September-2022
Prepared By	Shenzhen CTI International Certification Co., Ltd
Contact	Address: F8-A CTI Building, No.4 LiuXianSan Road, Xin'an Street, Bao'an District, 518101, Shen Zhen, China Tel: +86 10 65580012 Email: linshunrong@cti-cert.com Website: http://www.cti-cert.org
Approved By	Zhou Lu 
Work Carried Out By	Team Leader: Tong Dezheng Team Member: Feng Tian Technical Reviewer: Lin Shunrong Technical Review Expert: Shu'E JIANG

Summary:

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions reported for the project activity “Huineng Low Concentration Coal Mine Methane Utilization Project” (VCS Project ID:2830) for the monitoring period 01/01/2016-31/12/2018 within the 1st VCS crediting period 04/11/2013-30/06/2023, to review and determine the monitored reductions in GHG emissions that have occurred as a result of the project activity. These emission reductions are claimed as Verified Carbon Units (VCU) under the VCS Standard Version 4.3.

The verification was performed on the basis of VCS Standard Version 4.3 for the VCS projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. The verification was conducted by means of document review, follow-up interviews and site inspections, and the resolution of outstanding issues. The verification team identified two CLs, and no CAR or FAR is raised in this monitoring period.

In CTI's opinion, the GHG emission reductions reported for the project in the monitoring report (version 02 dated 19/09/2022) are fairly stated. The GHG emission reductions of the period from

01/01/2016-31/12/2018 within the 1st VCS crediting period were calculated correctly on the basis of approved methodology ACM0008 “Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation” (version 07), the registered VCS PD (version 4.0, dated 14/07/2022) and approved revised CDM-PDD (Version 05 dated 02/05/2017).

CTI does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCU's shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to CTI and the engagement conditions detailed in this report. CTI cannot be held liable by any party for decisions made or not made based on this report.

Hence, CTI is able to certify that the emission reductions from the “Huineng Low Concentration Coal Mine Methane Utilization Project” during this monitoring period from 01/01/2016-31/12/2018 amount to 732,284 tCO_{2e}.

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1 INTRODUCTION

Vitol (China) Energy Co., Ltd. has commissioned Shenzhen CTI International Certification Co., Ltd (CTI) to carry out the verification and certification of emission reductions reported for the “Huineng Low Concentration Coal Mine Methane Utilization Project” (the Project) for the monitoring period 01/01/2016-31/12/2018. This report contains the findings from the verification and includes a verification statement for the verified carbon units.

1.1 Objective

Verification is the periodic independent review and ex-post determination by an accredited verification body of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined verification period.

A verification statement is the written assurance by a verification body that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and provide a verification statement of emission reductions reported for the “Huineng Low Concentration Coal Mine Methane Utilization Project” for the period 01/01/2016-31/12/2018.

1.2 Scope and Criteria

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement;
- To verify that reported GHG emissions data is sufficiently supported by evidence.

The criteria of the verification are:

- VCS Program Guide (version 4.2)/49/
- VCS Standard (version 4.3)/48/ and other relevant requirements defined by Verra;
- The approved methodology ACM0008 (version 07)/52/ applied by the project.

The verification shall ensure that reported emission reductions are complete and accurate in order to be verified.

1.3 Level of Assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement. As per the para 3.9.1 of the VCS Standard Version 4.3, the project size categorization belongs to 'Large Project' as the expected annual emission reductions is 352,106 tCO₂e larger than 300,000 tCO₂e. Therefore, according to the requirement of para 4.1.8 (4) of VCS standard Version 4.3 "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 and one percent for large projects.", CTI applied a materiality threshold of 1% with respect to omission or misstatements concerning reported quantities of the project activity.

1.4 Summary Description of the Project

Sectoral Scope and Project Type

According to the VCS Program Guide (version 4.2)/49/ and Annex A of the Kyoto Protocol, the project is applicable under the following activity categories:

- Sectoral scope 8: Mining/mineral production and sectoral scope 10: Fugitive emissions from fuels (solid, oil and gas)
- Project Type: CMM gas capture and utilization project

Project Background

The project is located in Xincheng Village, Zhangzhuang Town, Pingding County, Yangquan City, Shanxi Province, People's Republic of China. The site location's approximate coordinates are 113°34'15"~113°39'40"E and 37°41'11"~ 37°43'57" N. The project activity was registered as a CDM project with Ref.8006 on 28/12/2012 and the 10-year fixed crediting period was selected starting on 01/07/2013. The project has been registered as VCS project with VCS ID. 2830 under VCS Standard Version 4.2 with the crediting period start date 04/11/2013 when the commencement of operations activities started as confirmed by checking the Commissioning Report /42/, operation logs/7/, VCS gap validation report /11/, the previous approved CDM monitoring report and verification report /39//40/. The crediting period adopted under VCS is 04/11/2013-30/06/2023, however, as per Clarification 1 of Errata and Clarifications, VCS Standard Version 4.1, for a project that does not include afforestation and/or reforestation activities, only emission reductions with vintages beginning on or after 1 January 2016 are eligible for VCU issuance. Thus, the first monitoring period i.e. this monitoring period under VCS was determined as 01/01/2016-31/12/2018.

GHG emission reductions have been applied for CERs under CDM of which total 360,993 tCO₂e have been issued for the monitoring period 01/07/2013-24/09/2015.

The installed capacity of the project is 12MW equipped with 8 sets of gas generators in type of 500GF-W1 with unit capacity of 500kW and 8 sets of gas generators in type of 1000GF9-W2 with unit capacity

of 1000kW, both manufactured by Shandong Jichai Green Energy Power Equipment Co. Ltd. The electricity generated by the project activity is supplied to the North China Power Grid (NCPG), and the project is estimated to deliver 352,106 tCO₂e emission reductions annually.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification was performed through means of the following three phases in accordance with the requirement of the registered VCS PD (version 4.0 dated 14/07/2022) and monitoring plan contained in the approved revised CDM-PDD (Version 05 dated 02/05/2017), the applied methodology, and the VCS Standard (Version 4.3) and other relevant VCS requirements:

- A desk review of the monitoring report and all support documents;
- Follow-up interviews with project stakeholders and site inspection;
- The resolution of outstanding issues and the issuance of the verification report and statement.

The following sections outline each step in more detail.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records;
- The calibration and maintenance records for the monitoring instruments;
- The management systems to support the project operation and monitoring.

2.2 Document Review

Based on the requirements of competency, experience and qualified sectoral scopes, CTI appointed a verification team in accordance with CTI's internal procedures.

Function	Name	Technical competence	Task Performance*
Team Leader	Tong Dezheng	1.2, 8.1, 10.1	☒ DR ☒ SV ☐ RP ☐ TR
Team Member	Feng Tian	1.2	☒ DR ☒ SV ☒ RP ☐ TR
Technical Reviewer	Lin Shunrong	1.2, 14.1, 15.1	☒ DR ☐ SV ☐ RP ☒ TR
Technical Review Expert	Shu'E JIANG	6.1, 8.1, 10.1	☒ DR ☐ SV ☐ RP ☒ TR

*DR=Document review; SV=Site visit; RP=Reporting; TR=Technical review

In addition to the VER/VCU monitoring report/1/, the registered VCS PD /11/, approved revised CDM-PDD (Version 05 dated 02/05/2017) /38/, emission reduction calculation spreadsheet/2/ during this monitoring period, the following documents also were assessed as a part of the verification audit:

- The VCS validation report /11/;
- The validation report of approved revised CDM-PDD /38/;
- The previous CDM/CER monitoring report /39/and verification report/40/;
- Baseline and monitoring methodology ACM0008 (version 07) applied by the project/52/;
- Relevant decisions, clarifications and guidance from the Verra/48/-/51/; and
- Other information and references relevant to the project activity.

During the desk review, CTI has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures; and

An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

On 10/08/2022, CTI visited the project operator: Pingding County Yonder Coal Mine Methane Development Co., Ltd which is a fully owned subsidiary of the project proponent Beijing Yonder Environmental Energy Technology Co., Ltd. to perform on-site assessment. Main topics of the interview cover implementation of the project construction, applicability of selected methodology, implementation of project monitoring, emission reduction calculation, etc.

The key personnel interviewed /53/ are summarized in the table below:

Interviewed personnel	Role	Organization	Subject
Mr. Jiao Xuefeng	Plant Director	Pingding County Yonder Coal Mine Methane Development Co., Ltd	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Calibration of meters and equipment maintenance; The complaint by local stakeholders; The stakeholder consultation during the operation of the project activity. Project's sustainable development contributions.
Mr. Zhao Shuhua	O&M Staff		
Mr. Wang Yijia			

Mr. Wang Chao	Carbon Manager	Beijing Yonder Environmental Energy Technology Co., Ltd.	
Mr. Zheng Yunlong	Local resident	Local Village	The impact of the project activity; The complaint by local stakeholders; The stakeholder consultation during the operation of the project activity; Project's sustainable development contributions.
Mr. Dong Futing			
Mr. Geng Jianchun	Staff	Local Environment Protection Bureau	
Ms. Li Ning	Project Manager	Vitol SA	Data collection and ER calculation.

2.4 Site Inspections

During the on-site assessment, CTI has applied standard auditing techniques to assess the quality of information provided. The following aspects of the project activity have been verified:

- An assessment of the implementation and operation of the registered project activity is as per the registered VCS PD of the project activity;
- A review of information flows for generating, recording, aggregating and reporting the monitoring parameters; and
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant logbooks and the electricity receipts;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the registered VCS PD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions; and
- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

In addition, all parameters required by the monitoring methodology ACM0008 (version 07), and the management system were assessed during the site visit.

2.5 Resolution of Findings

A corrective action request (CAR) shall be raised, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project proponents.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

The verification team identified 2 CLs and no CAR in this monitoring period. The CLs were satisfactorily addressed by the project proponents in the updated monitoring report version 02 dated 19/09/2022 (refer to Appendix D for further details).

2.5.1 Forward Action Requests

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

CTI confirmed that there was no FAR identified in previous verification /40/, and no FAR was raised during this verification.

2.6 Eligibility for Validation Activities

The project has been validated by China Environmental United Certification Center Co., Ltd under the CDM rules and registered as CDM project on 28/12/2012. It has one monitoring period: 01/07/2013-24/09/2015 with issued CERs and the verification is undertaken by CTI as confirmed by checking the UNFCCC website.

The project has been registered as VCS project under VCS standard version 4.2 through gap validation by CTI and this monitoring period 01/01/2016-31/12/2018 is the first monitoring period under VCS after the gap validation.

CTI was accredited in Sectoral Scope 8 and 10 on validation and verification and thus is eligible for verification activities on the project. In combination with the previous verification undertaken by CTI for the period 01/07/2013-24/09/2015 under CDM, the total reporting period of 01/07/2013-24/09/2015 and 01/01/2016-31/12/2018 is no more than consecutive 6 years, therefore, the verification undertaken by CTI is in line with the requirement for VVB stipulated in Section 4.1.20 of VCS standard Version 4.3.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project has been registered as a CDM project on 28/12/2012 under the UNFCCC with Ref. 8006. The 10-year fixed CDM crediting period was selected starting on 01/07/2013. By checking the UNFCCC website: <https://cdm.unfccc.int/Projects/DB/CEC1351854040.36/view>, it is confirmed that total 360,993tCO₂e of CERs have been issued for the monitoring period 01/07/2013-24/09/2015.

3.2 Methodology Deviations

The validation process /31/ has assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable CDM methodology ACM0008 (version 07) /52/. There was not any methodology deviation applied to this project. Details refer to section 4.1.

3.3 Project Description Deviations

By checking the UNFCCC website, it is confirmed that a PRC has been approved by CDM EB on 09/11/2017. The main changes in the revised PDD include:

- The name of the transformer station which the project was connected to changed from Nanyangsheng transformer station to Xincun transformer substation but the location was not changed;
- Number of electricity meters installed changed from three to one;
- The number and unit capacity for gas generators changed from 24 gas generators with unit capacity of 500kW to 8 gas generators with unit capacity of 500kW and 8 gas generators with unit capacity of 1000kW and the total capacity accounted for 12MW which was not changed.

By checking the validation opinion on the changes in PDD (version 02 dated 08/05/2017) /38/ approved by CDM EB, CTI confirms that the changes have no impact on applicability of the methodology, the additionality of the project activity nor the appropriateness of the baseline scenario. During this monitoring period, the project has been implemented in accordance with the approved revised CDM PDD and there is no other deviation occurred. Thus, CTI confirms that the project remains in compliance with VCS Program rules and meet all appropriate rules and requirements of VCS standard.

3.4 Grouped Project

The project was not a grouped project; hence this clause is not applicable.

4 VERIFICATION FINDINGS

This section summarizes the findings from the verification of the emission reductions reported for the “Huineng Low Concentration Coal Mine Methane Utilization Project” for the monitoring period 01/01/2016-31/12/2018.

4.1 Project Implementation Status

Project Implementation in accordance with the registered project design document

The project is a CMM gas utilizing project which utilizes the CMM gas captured from Huineng Low Concentration Coal Mine located at Xincheng Village, Zhangzhuang Town, Pingding County, Yangquan City, Shanxi Province, People’s Republic of China for power generation. The geographical coordinates are verified by GPS system as 113°34’15”~113°39’40”E and 37°41’11”~ 37°43’57” N. The methane concentration of the project is about 25% and varies between 10%-30% as confirmed by checking the monthly methane concentration records /13/. The total installed capacity is 12MW equipped with 8 sets of gas generators in type of 500GF-W1 with unit capacity of 500kW and 8 sets of gas generators in type of 1000GF9-W2 with unit capacity of 1000kW. It was confirmed by checking the Commissioning report /42/, the operation logs/7/, the previous CDM monitoring report and verification report /39//40/ that the first 6 sets of 500kW gas generators were put into operation since 04/11/2013, 4 sets of 1000kW gas generators were put into operation on 29/11/2014, 2 sets of 500kW gas generators were put into operation on 08/05/2015 and the final 4 sets of 1000kW of gas generators were put into operation since 08/09/2017. By checking the diagram of the pipeline /12/ system of the project and via on-site inspection, it is confirmed that flame arresters on pipelines are installed to prevent tempering and a fine water mist system is installed in transport pipelines to ensure the CMM gas is dehydrated before being transmitted to the intake system of the combustion engines. The actual implementation of the project during this verification period was verified in terms of nameplates of gas generators /41/ and the equipment purchase contract /44/. The details of the gas generators with respect to their installation and capacity have been verified to be consistent with description indicated in the registered VCS PD. Via on-site inspection, interviewing with PP and checking the daily operation and maintenance records /8/, it is confirmed that the project captures and utilizes the extracted CMM that would otherwise be vented into the atmosphere directly. The remaining uncaptured methane is directly vented into the atmosphere for safety operation which is in line with the applied methodology /52/. No overlap nor other issues may influence the utilization of CMM gas occurred during this monitoring period.

The electricity generated by the project activity is supplied to the North China Power Grid, which can be confirmed by the Power purchase agreement (PPA) signed between Pingding County Yonder Coal Mine Methane Development Co., Ltd. and National Grid Shanxi Electric Power Company/3/. The CMM flow and the methane concentration are monitored continuously by the gas flow meter and the methane concentration analyzer respectively and meanwhile being converted automatically to mass under normal condition by the automatic monitoring system installed as confirmed via on-site inspection and interviewing with PP. All the monitoring system in operation period is consistent with the description in

the monitoring plan. The control system at the power plant is automated and assures continuous operation, including monitoring on malfunction of equipment. By checking the daily operation and maintenance records/7/ and via on-site visit, CTI can confirm that no serious malfunction happened and the plant was under a normal operation as expected in this monitoring period.

On-site training for the related procedures including, recording and reporting was verified to be in place/6/ and their implementation was confirmed by interview with the key operators/53/ and observing the operation.

CTI confirms that the project implementation is in accordance with the project description contained in registered VCS PD. Furthermore, through visual inspection and document review, it is confirmed that all physical features of the project activity including data collection systems and storage systems have been implemented in accordance with the monitoring plan.

Participation or any rejection under any other GHG programs, any other form of environmental credit or emissions trading program since validation or previous verification

By checking the UNFCCC website: <https://cdm.unfccc.int/Projects/DB/CEC1351854040.36/view>, it is confirmed that the emission reductions within the monitoring period 01/07/2013-24/09/2015 have been issued as CERs and no other issuance request was submitted under CDM.

Therefore, it is concluded no double counting issuance has occurred for this verified monitoring period 01/01/2016-31/12/2018 under both VCS and CDM programmes. Via the on-site interview, the project proponent confirmed the emission reductions for this verified period are only requested for VCUs issuance.

The verification team has also checked other GHGs programs and forms of credit such as exchange platform of Chinese Certified Emission Reduction (CCER) projects, Gold Standard, EU ETS, IREC, China ETS and based on the interview with the project proponent, during this monitoring period, it is confirmed that except CDM and VCS scheme:

- No evidence showing that the project has participated or been rejected under any other GHG programs since validation or previous verification.
- There is no observation that the project has received or sought any other emission trading program and form of environmental credit, or has become eligible to do so since validation or previous verification.

The project is completely voluntary CDM and VCS project, not included in an emissions trading program or any other mechanism that includes GHG allowance trading. Although the national emission trading scheme has been launched since 16/07/2021, it is confirmed that the project proponent Beijing Yonder Environmental Energy Technology Co., Ltd. and its fully owned subsidiary Pingding County Yonder Coal Mine Methane Development Co., Ltd are not included the mandatory Emission Trading Scheme (ETS) and there is no emission cap enforced for both of them by checking compulsive company list under China ETS in public information/35/.

Moreover, it is confirmed by CTI the project is not registered as a CCER project in China, the emission reductions generated by the project activity are not eligible for transaction under China ETS as per the regulation/34/. Also, CCER mechanism has been suspended by Chinese government since 2017/35/, the project activity will not and is not allowed to registered under CCER mechanism. Thus, the assessment team concluded that the project activity not involved on other emissions trading programs and other binding limits.

The Statement on no double counting made by PP /45/ was checked by the verification team and confirmed to be correct in terms of the regulations and database of CCER and China ETS.

SD contributions resulted by implementation of the project activity

Via the on-site inspection, and through the interviews with the project proponent, local villagers and official from local environment bureau, and by checking the evidences provided by the project proponent, the verification team agrees on the following points regarding to the promotion of sustainability development by the project activity:

- *SDG 7, Indicator: Volumes of electricity supplied to the grid that reduces the consumption of fossil fuel use*

The project provides electricity through making use of CMM gas, displacing fossil fuel power in the grid North China Power Grid. During this monitoring period, 106,239 MWh of net electricity generated was delivered to the North China Power Grid. It is verified by checking monthly reading records/8/, electricity sales receipts /9/ and via on-site inspection. Which is also corresponding to China's sustainable development goal: reduce the energy consumption per GDP, energy to be more efficiently utilized, and the energy consumption and carbon intensity dropped continuously stated in "2030 China Fulfilling Sustainability Progress Report (2021)" /46/

- *SDG 8, Indicator: Numbers of decent work opportunities provided which have income higher than local average level*

It is verified by interviewing with project proponent, staff and local villagers and checking the Statement on the annual income of employees from 2016 to 2018 /36/ and Per capita disposable income of residents in Shanxi Province in 2016 and 2018 /37/, that the project activity provides 16 long-term job opportunities for local residents including 5 positions for female and provides higher salary from 69,381 RMB/year in 2016 to 71,136 RMB/year in 2018 above the local average level of 27,352 RMB/year in 2016 and 31,035RMB/year in 2018. Hence, the contribution to this SDG has been confirmed and the provisions for monitoring and reporting this goal is verified as reasonable. This also contributes to one of the China's actions for encouraging creation of job opportunities, and promoting high quality job in production sector in different channels stated in the "2030 China Fulfilling Sustainability Progress Report (2021)" /46/.

- *SDG 13, Indicator: Tonnes of greenhouse gas emissions avoided or removed*

As verified by on-site inspection, and via checking the emission reduction calculation sheet/2/ and the monthly reading records/8/, 732,284 tCO₂e GHG emission reductions are generated by the

project activity during this monitoring period. This contributes achieve one of China's stated sustainable development priorities stated in "2030 China Fulfilling Sustainability Progress Report (2021)": achieve carbon emission peak value in 2030, and try to be carbon neutral in 2060 stated in "2030 China Fulfilling Sustainability Progress Report (2021)"/46/.

Meanwhile, as per MR template v4.1, *"the cumulative impact should be calculated by summing the current project contributions with all impacts included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports"*, since this is the first monitoring period under VCS scheme, the cumulative contributions over the project lifetime are considered as the same as the current project contributions.

In conclusion, Verification Team was able to confirm that the project implementation is in accordance with the project description contained in the VCS PD. All required equipments and procedures are available and implemented in an appropriate manner. All necessary monitoring instruments are installed and operated. The project is completely operational and the same has been confirmed on-site. Neither mistakes nor malfunction on main meters have been observed during this monitoring period.

4.2 Safeguards

4.2.1 No Net Harm

Via on-site inspection and checking the EIA summary and conclusion provided in the approved VCS PD, it is confirmed that the impact caused by the project activity on the surrounding ecosystem and residents, wastewater, noise, solid waste and atmosphere etc. is insignificant, there would be no net harm caused due to the project activity. Appropriate mitigation measures have been undertaken by the project proponent to avoid the potential impacts during the construction and operation. The EIA of the project are approved by the government /27/.

Also, no potential environment or social economic matter was found during the site visit. It is verified by interviewing with project proponent, staff and local villagers and checking the Statement on the annual income of employees from 2016 to 2018 /36/ and Per capita disposable income of residents in Shanxi Province in 2016 and 2018/37/, that the project has contributed to the local employment and improved income levels by providing job opportunities and offering permanent employees wages well above local average income levels. As stated by the plant staff during the on-site interviews, they have gained knowledge and skills in the regular training organized by the project proponent, so it can be judged that the project has, to some extent, improved the marketability of the employees as well as the possibility of lifelong learning for them.

In conclusion, the implementation of the project activity does not cause any significant negative environmental or socio-economic impacts and is beneficial to the local socio-economic environment.

4.2.2 Local Stakeholder Consultation

The local stakeholder's meeting was held at the project site on 01/03/2012. Representatives from the local government and local residents attended the meeting. The project owner introduced the proposed project and the opinions expressed by the stakeholders were recorded and are available on request. The project owner carried out a questionnaire survey on the local stakeholders of which total 30 questionnaires were given out and all of them were returned successfully.

The stakeholder meeting and the questionnaire survey showed that the proposed project receives strong support from the local community. They all believe the proposed project will promote local economic development and agree with the project development and construction.

For continuous communication with local stakeholders, the project owner has informed the local authority, the neighborhood committee, and local residents of any key events and changes of the project through the bulletin boards. The project owner also carried out questionnaire survey every 2-3 years i.e. during 16/03/2017-17/03/2017 within this monitoring period to collect the relevant comments and suggestions and furthermore, the stakeholders can also make comments and raise concerns by calling the contact person of the project proponent via the published phone number. During this monitoring period and no negative comment nor grievance was received by checking the filled questionnaires /10/ and interviewing with the project proponent and local residents through on-site visit. Moreover, through interviewing with staff from local environmental protection bureau and local residents during the site visit, it is confirmed by the verification team that during the implementation stage of this monitoring period, local authority has conducted spot checks on the implementation of the project periodically as per the request from the local governments' regulations, no negative comments and issues from the local stakeholders during this monitoring period were identified and the project passed all the periodic spot checks by local government.

All such conclusion has been verified through site visit and checking VCS PD.

CL 01 was raised and successfully closed, please refer to Appendix D for details.

4.3 AFOLU-Specific Safeguards

For non-AFOLU projects, this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Compliance of monitoring plan with monitoring methodology

CTI is able to confirm that the monitoring plan contained in the approved revised CDM-PDD (Version 05 dated 02/05/2017) is in accordance with the approved methodology applied by the project activity, i.e. ACM0008 (version 07).

Compliance of monitoring with the monitoring plan

CTI confirms that the parameters stated in the monitoring plan are monitored and reported appropriately. Parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0008 (version 07) and the management system was assessed during the site visit. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, recording, aggregation, calculation and reporting) for each parameter is provided. The information flow for each parameter is further verified in the following sections.

Parameters fixed ex ante

“Data and parameters fixed ex-ante” in the MR are checked against the registered VCS PD. The parameters fixed ex-ante are as follows:

- Eff_{ELEC} is the efficiency of methane destruction/oxidation in power plant;
- $EF_{grid,CM,y}$ is the combined emission factor of the grid, which was determined ex-ante at the validation stage and has been fixed during the crediting period;
- ρ is the methane density;
- CEF_{CH_4} is the carbon emission factor for combusted methane
- GWP_{CH_4} is the Global warming potential of methane

CTI verified and confirms that the Eff_{ELEC} , $EF_{grid,CM,y}$, ρ and CEF_{CH_4} used in the monitoring report is in compliance with the approved revised CDM PDD and the value of GWP_{CH_4} used in the monitoring report has been updated from 25 tCO₂e/tCH₄ to 28 tCO₂e/tCH₄ according to the IPCC Fifth Assessment Report (AR5) as per Section 3.14.4 of VCS Standard Version 4.3.

Other ex-ante parameters (i.e. $FC_{i,y}$, NCV_i , $OXID_i$, $EF_{CO_2,i}$, EG_y , η_i , η_b , $CAP_{i,j,y}$, $EF_{grid,BM,y}$) were used to calculate the parameter $EF_{grid,CM,y}$ in the approved revised CDM PDD and the parameters which were validated in the validation process. CTI verified and confirms that the parameters fixed ex-ante used in the monitoring report is in compliance with the approved revised CDM PDD.

Parameters monitored

CTI conducted document review and performed on-site assessment with project stakeholders to:

- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant logbooks and sales receipts;
- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

According to the approved revised monitoring plan, the parameters to be monitored are as below:

$CONS_{ELEC,PJ}$	Additional electricity consumption for capture and use or destruction of methane (MWh)
MM_{ELEC}	Methane sent to power plant (tCH ₄)
CEF_{NMHC}	Carbon emission factor for combusted non methane hydrocarbons (NMHC) (various) (tCO _{2e} /tNMHC)
PC_{CH_4}	Concentration (in mass) of methane in extracted gas (%), measured on wet basis (%)
PC_{NMHC}	NMHC concentration (in mass) in extracted gas (%)
GEN_y	Electricity generation by project (MWh)

Monitored parameter $CONS_{ELEC,PJ}$ and GEN_y

By site inspection and checking monitoring plan and previous verification report, CTI confirmed that:

$CONS_{ELEC,PJ}$ and GEN_y are continuously measured by bi-directional meter E with accuracy class of 0.5S installed at the grid-connection point at the grid company's side and are monthly recorded by the grid company at 24:00 on the last day of every month.

The verification team had on-site checked the location of the meter against the diagram of power connection system /4/ and found them to be consistent and installed in accordance with the monitoring plan.

By checking operation log /7/ and via on-site visit, it is confirmed that the meter E was working well during this monitoring period. Via the on-site interview and by checking the daily operation and maintenance records/7/, monthly reading records and electricity sales receipts /9/ issued by grid company, it is confirmed by the verification team that $CONS_{ELEC,PJ}$ and GEN_y are continuously measured and monthly recorded by the grid company at 24:00 on the last day of every month. The grid company supplies the monthly reading records and the sales receipts to the project proponent every month and the sales receipts have been used for cross-checking with the monthly reading records, the most conservative values were used for the monitoring report and ERs calculation spreadsheet, which has been verified by the verification team.

Monitored parameter MM_{ELEC}

According to the monitoring plan and previous verification report, the methane sent to power plant (MM_{ELEC}) is measured and automatically calculated by the installed monitoring system, by which the monitored CMM flow in volume measured by gas flow meter and the methane concentration in the extracted CMM measured by methane concentration analyzer are converted into mass under normal condition. The verification team has on-site inspected the automatic monitoring system and confirmed that the CMM flow and methane concentration are continuously monitored and being

automatically converted to mass based on the measured CMM flow, methane concentration, temperature, pressure and density of CH₄.

The CMM flow and methane concentration are measured continuously and reported monthly in the monthly CMM flow and methane concentration records /13/.

The verification team had on-site checked the location of the gas flow meter and the methane concentration analyzer against the diagram of the CMM treatment system /12/ of project and found them to be consistent and installed in accordance with the monitoring plan. The gas flow meter and the methane concentration analyzer are working well as confirmed by checking the operation logs/7/ and via on-site inspection.

Data in the monthly CMM flow and methane concentration records were used to the report and have been cross-checked with the manual records and the data used for monitoring report and ER calculation spreadsheet is complete and correct as verified by CTI.

Monitored parameter CEF_{NMHC}

CEF_{NMHC} is the carbon emission factor for combusted non methane hydrocarbons and is obtained from annual gas composition analysis. As per registered PD /11/ and methodology ACM0008 (version 07), when the share of NMHC is less than 1 %, this factor is not needed.

By checking the NMHC sampling test reports /25/ for year 2016, 2017 and 2018 issued by Shanxi Kelin Mineral Testing Technology Co., Ltd. which is a qualified /24/ external testing institute. It is confirmed that the frequency of gas composition analysis is annual which is in line with the monitoring plan. It is also confirmed that the NMHC concentration in extracted CMM gas in 2016, 2017 and 2018 is 0.0065%, 0.0061% and 0.0069% respectively which are all less than 1%, thus, CEF_{NMHC} is not needed during this monitoring period.

Monitored parameter PC_{CH4}

Via on-site inspection and checking the monitoring plan and previous verification report, CTI confirms that PC_{CH4} is continuously measured by the methane concentration analyzer installed at the project site and calculated on a monthly average value and documented in the monthly records of methane concentration /13/.

Data in the monthly CMM flow and methane concentration records /13/ were used to the report and have been cross-checked with the manual records and the data used for monitoring report and ER calculation spreadsheet is complete and correct as verified by CTI.

Monitored parameter PC_{NMHC}

NMHC concentration (in mass) in extracted gas PC_{NMHC} is obtained from the annual gas composition analysis done by the qualified external institute i.e. Shanxi Kelin Mineral Testing Technology Co., Ltd. By checking the NMHC sampling test reports /25/ for year 2016, 2017 and 2018, it is confirmed that the frequency of gas composition analysis is annual which is in line with the monitoring plan. It

is also confirmed that the NMHC concentration in extracted CMM gas in 2016, 2017 and 2018 is 0.0065%, 0.0061% and 0.0069% respectively.

Monitoring equipment and calibration

The documents review was carried out. Particular attention was paid to the frequency of measurements, the quality of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the approved revised CDM PDD and the methodology ACM0008(version 07) and corresponding tool(s), and the quality assurance and quality control procedures.

All monitoring equipments have been calibrated in line with the monitoring plan and the national standards covering this monitoring period. The relevant information of the calibration is listed as below:

Monitoring equipment	Type	Serial NO.	Accuracy	Calibration frequency	Calibration date	Validity date	Calibration entity
Electricity meter E	DSZ178	12007033 99	0.5S	Annually	30/11/2015 30/11/2016 30/11/2017 30/11/2018	30/11/2016 30/11/2017 30/11/2018 30/11/2019	Testing lab of National Grid Yangquan Electric Power Company
Gas flow meter (old)	LUGB-600	HD150504	1.0	Once every 3 years	18/06/2013	17/06/2016	Naval Ship Hydrodynamics and Structure Performance Inspection Laboratory, No.702 Institute of China Shipbuilding Industry Corporation
Gas flow meter (new)	TK7200BM6H	15011257 630045	0.25	Once every 3 years	04/05/2016	03/05/2019	Anhui Tiankang Group Co., Ltd. Testing Centre
Methane concentration analyzer	FGD2-A	20151022 034	Class II	Once every 3 years	09/09/2013 21/08/2016	08/09/2016 20/08/2019	Guangzhou Institute of Measurement and Testing Technology Shenzhen Academy of Metrology & Quality Inspection National Hi-tech Metrology Station

By checking operation log /7/ and via on-site visit, it is confirmed that the old gas flow meter in type of LUGB-600 (SN: HD150504) has been replaced by the new one in type of TK7200BM6H (SN: 15011257630045) on 04/05/2016 due to periodic check reason by the project proponent. Through on-site interview with PP and by checking the qualification documents of Anhui Tiankang Group Co., Ltd. Testing Centre /22/, Calibration Certificates /23/ the nameplates of the new gas flow meter, it is confirmed that the accuracy class of the new gas flow meter is 0.25 which is higher than the old one (accuracy class of 1.0) and thus still meets the accuracy requirement of the registered PD.

Calibration records and accreditation certificates/14/- /23/ have been verified by the verification team. The actual accuracy for electricity meter E is verified to be 0.5S. The actual accuracy for the

old and new gas flow meters is verified to be 1.0 and 0.25 respectively. The accuracy class for the methane concentration analyzer is confirmed to be class II. The accuracy of all monitoring equipments is in line with the requirement in the monitoring plan and the relevant national standards /28/-/30/. The calibration frequency of electricity meter E is annual and the calibration frequency of the gas flow meter and methane concentration analyzer is once every 3 years which is consistent with the monitoring plan. Based on the site visit and by checking the calibration reports, CTI confirms that:

- All monitoring equipments have been installed in accordance with the monitoring plan;
- The equipments' accuracy is in line with the requirement of the monitoring plan;
- The calibration frequency of all monitoring equipments is in line with the monitoring plan and national technical standard /28/-/30/ as required by VCS standard. And the calibrations are verified to be valid for the whole reporting period.

CL 02 was raised and successfully closed, please refer to Appendix D for details.

Data management and control

Pingding County Yonder Coal Mine Methane Development Co., Ltd, a fully owned subsidiary of the project proponent Beijing Yonder Environmental Energy Technology Co., Ltd. is responsible for operation and routine maintenance of power plant under the project activity. The quality assurance and quality control procedures have been addressed in the project management and monitoring manual/5/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff/53/ and check records /7//8/ during on-site visit, it can be confirmed that the monitoring management system is implemented following the project management and monitoring manual.

All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. Calibration records of instruments used in measurements were made available during the verification visit and found to be valid for the entire period of the verification. Competence and training records of in-plant personnel engaged in measurement of plant parameters were presented during verification and found to be in order.

As the above and document review, verification team considers that the project activity operated properly in the way complying with the implementation plan and monitoring plan and the monitoring was performed in a transparent and comprehensive manner during this monitoring period.

Emission reduction calculation

CTI confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

According to the applied methodology, the emission reductions are determined as the difference between the baseline emissions, project emissions and leakage:

$$ER_y = BE_y - PE_y - L_y$$

Baseline emissions

As per approved revised CDM-PDD (Version 05 dated 02/05/2017) and the applied methodology ACM0008 Version 07, baseline emissions are determined as follows:

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

Where,

$BE_{MD,y}$ Baseline emissions from destruction of methane in the baseline scenario in year y (tCO_{2e})

$BE_{MR,y}$ Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO_{2e})

$BE_{Use,y}$ Baseline emissions from the production of power, heat or supply to gas grid replaced by the project activity in year y (tCO_{2e})

Methane destruction in the baseline

In the baseline scenario the CMM is fully vented into the atmosphere and no methane is destroyed. Thus, $BE_{MD,y} = 0$.

Methane released into the atmosphere

$$BE_{MR,y} = GWP_{CH_4} \times MM_{ELEC}$$

Where,

GWP_{CH_4} Global warming potential of methane (28tCO_{2e}/tCH₄)

MM_{ELEC} Methane measured sent to power plant (tCH₄)

The verification team has checked the monthly records of MM_{ELEC} /13/ against manual records of CMM volume, and confirmed the values of MM_{ELEC} used in the ER spreadsheet is complete and correct and calculations results of $BE_{MR,y}$ by vintages is shown in the table below:

Period	MM_{ELEC}	Methane density (ρ)	$MM_{ELEC} (tCH_4) = MM_{ELEC} (mm^3) * \rho$
	million m ³	(tCH ₄ /mm ³)	(tCH ₄)
01/01/2016-31/12/2016	13.56	670	9,084.43
01/01/2017-31/12/2017	13.52	670	9,057.17
01/01/2018-31/12/2018	11.31	670	7,575.23

Total	38.38	/	25,716.83
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Period	MM_{ELEC}	GWP_{CH4}	BE_{MR}= MM_{ELEC}*GWP_{CH4}
	(tCH₄)	(tCO_{2e}/tCH₄)	(tCO_{2e})
01/01/2016-31/12/2016	9,084.43	28	254,363
01/01/2017-31/12/2017	9,057.17	28	253,600
01/01/2018-31/12/2018	7,575.23	28	212,106
Total	25,716.83	/	720,069

Emissions from power generation by project

$$BE_{use,y} = GEN_y \times EF_{ELEC}$$

Where,

GEN_y Electricity generated by project activity in year y (MWh)

EF_{ELEC} Emissions factor of electricity (grid, captive or a combination) replaced by project (tCO_{2e}/MWh)

The electricity generated by the project is delivered to NCPG, thus, EF_{ELEC} is the same as the combined margin emission factor (EF_{grid,CM,y}) of NCPG which equals to 0.81145 tCO_{2e}/MWh as confirmed by checking the approved revised CDM PDD.

The verification team reviewed the monthly electricity meters reading records /8/, through cross-check with the sales receipts issued by the grid company, and confirmed that the electricity data used in the ER calculation spreadsheet and the MR is correct and complete. The calculation results of BE_{use,y} by vintages is shown in the table below:

Period	GEN_y	CEF_{ELEC}	BE_{use,y}= GEN_y*EF_{ELEC}
	MWh	MWh/tCO_{2e}	tCO_{2e}
01/01/2016-31/12/2016	38,035.8	0.81145	30,864
01/01/2017-31/12/2017	37,182.8	0.81145	30,171
01/01/2018-31/12/2018	31,020.4	0.81145	25,171
Total	106,239.0	/	86,206

Total baseline emissions

The total baseline emissions by vintages are shown in the table below:

Period	BE_{MD}	BE_{MR}	BE_{use,y}	BE_y
---------------	------------------------	------------------------	---------------------------	-----------------------

	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e
01/01/2016-31/12/2016	0	254,363	30,864	285,227
01/01/2017-31/12/2017	0	253,600	30,171	283,771
01/01/2018-31/12/2018	0	212,106	25,171	237,277
Total	0	720,069	86,206	806,275

Project emissions

As per approved revised CDM-PDD (Version 05 dated 02/05/2017) and the applied methodology ACM0008 Version 07, project emissions are determined as follows:

$$PE_y = PE_{ME} + PE_{MD} + PE_{UM}$$

Where,

PE_{ME} Project emissions from energy use to capture and use methane (tCO₂e)

PE_{MD} Project emissions from methane destroyed (tCO₂e)

PE_{UM} Project emissions from un-combusted methane (tCO₂e)

Combustion emissions from additional energy required for CMM capture and use

$$PE_{ME} = CONS_{ELEC,PJ} \times CEF_{ELEC}$$

Where,

$CONS_{ELEC,PJ}$ Additional electricity consumption for capture and use or destruction of methane (MWh)

CEF_{ELEC} Carbon emissions factor of electricity used by coal mine (tCO₂e/MWh)

As this project is connected to NCPG, the additional electricity is consumed from the NCPG, thus, CEF_{ELEC} is the same as the combined margin emission factor ($EF_{grid,CM,y}$) of NCPG which equals to 0.81145tCO₂e/MWh as confirmed by checking the approved revised CDM PDD.

The verification team reviewed the monthly electricity meters reading records /8/, through cross-check with the sales receipts issued by the grid company, and confirmed that the electricity data used in the ER calculation spreadsheet and the MR is correct and complete. The calculation results of PE_{ME} by vintages is shown in the table below:

Period	CONS _{ELEC}	CEF _{ELEC}	$PE_{ME} =$ CONS _{ELEC} *CEF _{ELEC}
	MWh	MWh/tCO ₂ e	tCO ₂ e
01/01/2016-31/12/2016	9.24	0.81145	8.00
01/01/2017-31/12/2017	9.18	0.81145	8.00
01/01/2018-31/12/2018	4.62	0.81145	4.00

Total	23.04	/	20
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Combustion emissions from use of captured methane

$$PE_{MD} = MD_{ELEC} \times (CEF_{CH_4} + r \times CEF_{NMHC})$$

Where,

MD_{ELEC}	Methane destroyed through power generation (tCH ₄)
CEF_{CH_4}	Carbon emission factor for combusted methane (2.75 tCO ₂ e/tCH ₄)
r	Relative proportion of NMHC compared to methane
CEF_{NMHC}	Carbon emission factor for combusted non methane hydrocarbons (the concentration varies and, therefore, to be obtained through periodical analysis of captured methane) (tCO ₂ e/tNMHC)

By checking the NMHC sampling test reports of the project for year 2016, 2017 and 2018, it is confirmed that the NMHC concentration during this monitoring period is less than 1%, thus, as per approved revised CDM PDD and the applied methodology ACM0008 Version 07, $r = 0$. Therefore, $PE_{MD} = MD_{ELEC} \times CEF_{CH_4}$. Of which, $MD_{ELEC} = MM_{ELEC} \times Eff_{ELEC}$

Where,

MM_{ELEC}	Methane measured sent to power plant (tCH ₄)
Eff_{ELEC}	Efficiency of methane destruction/oxidation in power plant (taken as 99.5% as per applied methodology ACM0008, Version 07)

Values of MM_{ELEC} used in the ER calculation spreadsheet and MR has been confirmed be correct and complete by checking the monthly records /13/against the manual records of CMM volume during on-site inspection, therefore, the calculation results PE_{MD} by vintages are shown in the table below:

Period	MM_{ELEC}	Methane density (ρ)	$MM_{ELEC} (tCH_4) = MM_{ELEC} (m^3) \times \rho$
	million m ³	(tCH ₄ /mm ³)	(tCH ₄)
01/01/2016-31/12/2016	13.56	670	9,084.43
01/01/2017-31/12/2017	13.52	670	9,057.17
01/01/2018-31/12/2018	11.31	670	7,575.23
Total	38.38		25,716.83

Period	MM _{ELEC}	Eff _{ELEC}	MD _{ELEC} = ME _{ELEC} * Eff _{ELEC}	CEF _{CH4}	PE _{MD} = MD _{ELEC} * CEF _{CH4}
	tCH ₄	(%)	tCH ₄	tCO ₂ e/tCH ₄	tCO ₂ e
01/01/2016-31/12/2016	9,084.43	99.5	9,039.01	2.75	24,858
01/01/2017-31/12/2017	9,057.17	99.5	9,011.88	2.75	24,783
01/01/2018-31/12/2018	7,575.23	99.5	7,537.35	2.75	20,728
Total	25,716.83	/	25,588.24	/	70,369

Un-combusted methane from project activity

The project emissions from un-combusted methane are calculated as following:

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

Where,

GWP_{CH4} Global warming potential of methane (28tCO₂e/tCH₄)

MM_{ELEC} Methane measured sent to power plant (tCH₄)

Eff_{ELEC} Efficiency of methane destruction/oxidation in power plant (taken as 99.5% from IPCC)

Values of MM_{ELEC} used in the ER calculation spreadsheet and MR has been confirmed to be correct and complete by checking the monthly records /13/, therefore, the calculation results PE_{UM} by vintages are shown in the table below:

Period	MM _{ELEC}	Eff _{ELEC}	GWP _{CH4}	PE _{UM} = MM _{ELEC} * (1 - Eff _{ELEC}) * GWP _{CH4}
	tCH ₄	(%)	(tCO ₂ e/tCH ₄)	tCO ₂ e
01/01/2016-31/12/2016	9,084.43	99.5	28	1,272
01/01/2017-31/12/2017	9,057.17	99.5	28	1,269
01/01/2018-31/12/2018	7,575.23	99.5	28	1,061
Total	25,716.83	/	/	3,602

Total project emissions

Total project emissions by vintages are shown in the table below:

Period	PE _{ME}	PE _{UM}	PE _{MD}	PE _y
	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e
01/01/2016-31/12/2016	8	1,272	24,858	26,138
01/01/2017-31/12/2017	8	1,269	24,783	26,060
01/01/2018-31/12/2018	4	1,061	20,728	21,793
Total	20	3,602	70,369	73,991

Leakages

Leakage does not need to be accounted for this project as per the monitoring methodology ACM0008 (version 07).

Emission reductions

The emission reductions for this monitoring period were calculated as:

Monitoring period	GHG emission reductions or removals (tCO ₂ e)
01/01/2016 – 31/12/2016	259,089
01/01/2017 – 31/12/2017	257,711
01/01/2018 – 31/12/2018	215,484
Total ERs claimed	732,284

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The assessment of each parameter related to calculate the GHG emission reductions is justified in Sections 4.1 and 4.4 above. Via the on-site inspection and desk review, the verification team verified the supporting evidence provided by the project proponent as listed in Appendix 3 used to determine the GHG emission reductions

For each reported data, the evidence is provided and verified as sufficient and quality is appropriate. Also, the cross-checks have been performed on the reported data with different source of evidence. The information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report has been assessed by VVB in Section 4.4. Moreover, the calibration is verified as stated in Section 4.1 via on-site inspection with evidences to confirm the meters' location, accuracy and calibration frequency are in line with requirement of the monitoring plan.

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

4.6 Non-Permanence Risk Analysis

The project is not AFOLU project, and thus non-permanence risk analysis is not applicable for the project.

5 VERIFICATION CONCLUSION

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions that have been reported for the project activity “Huineng Low Concentration Coal Mine Methane Utilization Project” in China (VCS Project ID: 2830) for the period 01/01/2016-31/12/2018.

The verification is based on the baseline and monitoring methodology ACM0008 (version 07), the VCS PD. The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification and certification report.

The project proponents are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the project monitoring report.

Our verification and validation approach was based on the requirements as defined under the applicable VCS Standard Version 4.3 and relevant UNFCCC requirements. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is implemented and operated as per the registered VCS PD ;
- the monitoring plan is as per the applied methodology;
- the monitoring complies with the monitoring plan;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS Standard Version 4.3 and CDM requirements;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements;
- the project deviation is appropriately described and justified; the deviation was verified by the verification team as valid, and the project remains in compliance with the VCS rules.

It is CTI's responsibility to provide an independent verification statement on the reported GHG emission reductions for the project. Based on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these, CTI planned and performed our work to obtain the information and explanations that we considered necessary to provide reasonable assurance that reported GHG emission reductions are fairly stated.

CTI does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCU's shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to CTI and the engagement conditions detailed in this report. CTI cannot be held liable by any party for decisions made or not made based on this report.

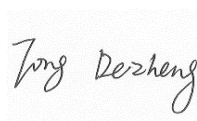
In CTI's opinion the GHG emissions reductions of the "Huineng Low Concentration Coal Mine Methane Utilization Project" for the period 01/01/2016-31/12/2018 are fairly stated in the monitoring report (version 02 dated 19/09/2022). The GHG emission reductions were calculated correctly on the basis of the approved methodology ACM0008 (version 07) and the monitoring plan contained in the registered VCS PD.

CTI 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, CTI confirms the following statement:

Reporting period: 01/01/2016-31/12/2018

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

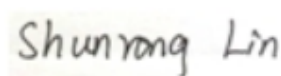
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016	285,227	26,138	0	259,089
2017	283,771	26,060	0	257,711
2018	237,277	21,793	0	215,484
Total	806,275	73,991	0	732,284



Mr. Tong Dezheng

Team Leader

26-September-2022



Ms. Lin Shunrong

Technical Reviewer

26-September-2022

APPENDIX A: ABBREVIATIONS

CAR	Corrective Action Request
CCER	Chinese Certified Emission Reduction
CER	Certified Emission Reduction(s)
CL	Clarification request
CMM	Coal mine methane
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CTI	Shenzhen CTI International Certification Co., Ltd
DOE	Designated Operational Entity
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
ETS	Emissions Trading Scheme
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
IREC	International Renewable Energy Certificates
MR	Monitoring Report
NCPG	North China Power Grid
NMHC	Non methane hydrocarbons
PD	Project Description
PP	Project Proponent
SN	Serial Number
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit

APPENDIX B: REFERENCES

Documentation used to verify the information provided by the project proponents

/1/	Vitol SA: VER/VCU Monitoring Report for Huineng Low Concentration Coal Mine Methane Utilization Project, version 01 dated 01/08/2022, version 02 dated 19/09/2022
/2/	Vitol SA: Emission reduction calculation spreadsheet for Huineng Low Concentration Coal Mine Methane Utilization Project, version 02 dated 02/09/2022
/3/	Pingding County Yonder Coal Mine Methane Development Co., Ltd and National Grid Shanxi Electric Power Company: Power Purchase Agreement for Huineng Low Concentration Coal Mine Methane Utilization Project
/4/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Diagram of power connection system
/5/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: VER monitoring manual and management procedure.
/6/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Records of training for on-site staff.
/7/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Daily operation and maintenance records.
/8/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Monthly reading records of meter E of Huineng Low Concentration Coal Mine Methane Utilization Project from 01/01/2016-31/12/2018
/9/	National Grid Shanxi Electric Power Company.: Electricity Sales Receipts from 01/01/2016-31/12/2018
/10/	Questionnaires filled by local stakeholders
/11/	Vitol SA: Registered VSC PD (version 4.0 dated 14/07/2022) CTI: VCS Gap Validation Report (version 02.0 dated 14/07/2022)
/12/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Diagram of the pipeline and CMM treatment system
/13/	Pingding County Yonder Coal Mine Methane Development Co., Ltd: Monthly records on CMM gas flow, methane concentration and MM_{ELEC} of Huineng Low Concentration Coal Mine Methane Utilization Project from 01/01/2016-31/12/2018
/14/	Yangquan City Administrative Examination and Approval Bureau: Accreditation certificates of Testing lab of National Grid Yangquan Electric Power Company which

	validity covering this monitoring period
/15/	Testing lab of National Grid Yangquan Electric Power Company: Calibration certificates for meter E: covering this monitoring period
/16/	Guangdong Province Quality and Technical Supervision Bureau: Accreditation Certificates for Guangzhou Institute of Measurement and Testing Technology which validity covering this monitoring period
/17/	Guangzhou Institute of Measurement and Testing Technology: Calibration Certificates for methane concentration analyzer FGD2-A issued on 09/09/2013 and valid to 08/09/2016
/18/	National Quality and Technical Supervision Bureau: Accreditation Certificates for Shenzhen Academy of Metrology & Quality Inspection National Hi-tech Metrology Station which validity covering this monitoring period
/19/	Shenzhen Academy of Metrology & Quality Inspection National Hi-tech Metrology Station: Calibration Certificates for methane concentration analyzer FGD2-A issued on 21/08/2016 and valid to 20/08/2019
/20/	China National Accreditation Service for Conformity Assessment: Accreditation Certificates for Naval Ship Hydrodynamics and Structure Performance Inspection Laboratory, No.702 Institute of China Shipbuilding Industry Corporation which validity covering this monitoring period
/21/	Naval Ship Hydrodynamics and Structure Performance Inspection Laboratory, No.702 Institute of China Shipbuilding Industry Corporation: Calibration Certificates for gas flow meter: LUGB-600 (old) issued on 18/06/2013 and valid to 17/06/2016
/22/	China National Accreditation Service for Conformity Assessment: Accreditation Certificates for Anhui Tiankang Group Co., Ltd. Testing Centre which validity covering this monitoring period
/23/	Anhui Tiankang Group Co., Ltd. Testing Centre: Calibration Certificates for gas flow meter: TK7200BM6H (new) issued on 04/05/2016 and valid to 03/05/2019
/24/	Shanxi Province Quality and Technical Supervision Bureau: Accreditation Certificates for Shanxi Kelin Mineral Testing Technology Co., Ltd.
/25/	Shanxi Kelin Mineral Testing Technology Co., Ltd.: NMHC sampling test report for Huineng Low Concentration Coal Mine Methane Utilization Project for year 2016, 2017 and 2018
/26/	Business licenses of Beijing Yonder Environmental Energy Technology Co., Ltd. and Pingding County Yonder Coal Mine Methane Development Co., Ltd
/27/	Shanxi Coal Management Academy: EIA of Huineng Low Concentration Coal Mine

	Methane Utilization Project dated 11/2010 Shanxi Province Environmental Protection Bureau: EIA Approval issued on 10/05/2011
/28/	State Economic and Trade Commission: Technical administrative code of electric energy metering (DL/T 448-2016)
/29/	State General Administration of the P.R.C. for Quality Supervision and Inspection and Quarantine: Verification Regulation of Vortex-shedding Flowmeter (JJG1029-2007)
/30/	State General Administration of the P.R.C. for Quality Supervision and Inspection and Quarantine: Verification Regulation of Alarmer Detectors of Combustible Gas (JJG693-2011))
/31/	UNFCCC, http://cdm.unfccc.int
/32/	Gold Standard, http://www.goldstandard.org/
/33/	China CCER Exchange Info-platform, http://cdm.ccchina.org.cn/ccer.aspx
/34/	Measures for the Administration of Carbon Emission Trading, issued by Ministry of Ecology and Environment of China, dated 31/12/2020
/35/	Enforced company list in China cap & trade scheme, issued by Ministry of Ecology and Environment of China
/36/	Beijing Yonder Environmental Energy Technology Co., Ltd.: Statement on the annual income of employees from 2016 to 2018
/37/	Per capita disposable income of residents in Shanxi Province in 2016 and 2018 http://www.shanxi.gov.cn/
/38/	The approved revised CDM-PDD (Version 05 dated 02/05/2017) Validation report of revised CDM-PDD (version 02 dated 08/05/2017)
/39/	CDM/CER Monitoring Reports for Huineng Low Concentration Coal Mine Methane Utilization Project of previous CDM monitoring periods 01/07/2013-24/09/2015
/40/	CDM Verification Reports for Huineng Low Concentration Coal Mine Methane Utilization Project of previous monitoring period 01/07/2013-24/09/2015
/41/	Shandong Jichai Green Energy Power Equipment Co. Ltd.: Nameplates of the equipment
/42/	Commissioning report of Huineng Low Concentration Coal Mine Methane Utilization Project
/43/	Taiyuan Coal Industry Design Institute: FSR of Huineng Low Concentration Coal Mine Methane Utilization Project dated 12/2011 Shanxi Province Development and Reform Commission: FSR approval issued on 27/02/2012

/44/	Co-signed by the Shandong Jichai Green Energy Power Equipment Co. Ltd., and the project proponent: Wind Turbines Purchase Agreement
/45/	Beijing Yonder Environmental Energy Technology Co., Ltd.: Statement on no double counting
/46/	2030 China Fulfilling Sustainability Progress Report (issued on 09/2021) http://switzerlandemb.fmprc.gov.cn/web/ziliao_674904/zt_674979/dnzt_674981/qtzt/2030kcxzyc_686343/zw/202109/P020211019126076276210.pdf
/47/	2006 IPCC Guidelines for National Greenhouse Gas Inventories IPCC: AR5 Synthesis Report: Climate Change 2014

Methodologies, tools and other guidance

/48/	Verified Carbon Standard: VCS Standard, Version 4.3
/49/	Verified Carbon Standard: VCS Program Guide, version 4.2
/50/	Verified Carbon Standard: VCS Sectoral Scopes http://v-c-s.org/node/448
/51/	Verified Carbon Standard: Registration and Issuance Process, version 4.2
/52/	UNFCCC EB: Approved methodology, ACM0008 , version 07

Persons interviewed

/53/	Interviewed personnel	Role	Organization
	Mr. Jiao Xuefeng	Plant Director	Pingding County Yonder Coal Mine Methane Development Co., Ltd
	Mr. Zhao Shuhua	O&M Staff	
	Mr. Wang Yijia		
	Mr. Wang Chao	Carbon Manager	Beijing Yonder Environmental Energy Technology Co., Ltd.
	Mr. Zheng Yunlong	Local resident	Local Village
	Mr. Dong Futing		
	Mr. Geng Jianchun	Staff	Local Environment Protection Bureau
	Ms. Li Ning	Project Manager	Vitol SA

APPENDIX C: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Mr. Dezheng TONG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

Qualification						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	✓	✓	✓	✓	-	✓

Scope	Technical Area
SS 1: Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources
SS 8: Mining/mineral production	TA 8.1: Mining/mineral production
SS 10: Fugitive emissions from fuels (solid, oil and gas)	TA 10.1: Fugitive emissions from oil and gas

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Wu Lin

Wu LIN

Technical Competent Manager

Shenzhen, 01/07/2019

Mr. Tian FENG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

Qualification					
GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
√	-	√	√	-	-

Scope	Technical Area
SS 1: Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Wu LIN

Wu Lin

Technical Competent Manager

Shenzhen, 10/02/2022

Ms. Shu'E JIANG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

Qualification						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	-	-	-	-	-	√

Scope	Technical Area
SS 6: Construction	TA 6.1: Construction
SS 8: Mining/mineral production	TA 8.1: Mining/mineral production
SS 10: Fugitive emissions from fuels (solid, oil and gas)	TA 10.1: Fugitive emissions from oil and gas

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Wu Lin

Wu LIN

Technical Competent Manager

Shenzhen, 01/01/2021

Ms. Shunrong LIN

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

Qualification						
Status	GHG Auditor	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date	√	√	√	√	√	√

Scope	Technical Area
SS 1: Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources
SS 14: Afforestation and reforestation	TA 14.1: Afforestation and reforestation
SS 15: Agriculture	TA 15.1: Agriculture

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by: *Wu Lin*

Wu LIN

Technical Competent Manager

Shenzhen, 01/01/2021

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

Table 1: Corrective Action Requests

CAR ID	Corrective Action Request	Response by Project Proponent	Verification Team Assessment
NA	NA	NA	NA

Table 2: Clarification Requests

CL ID	Clarification Request	Response by Project Proponent	Verification Team Assessment
CL 01	MR (version 01 dated 01/08/2022) lacks the description of the process for, and the outcomes from, ongoing communication with local stakeholders conducted prior to verification, thus, CL01 was raised to clarify.	Section 2.2 of the MR has been updated for the procedures and outcomes from, ongoing communication with local stakeholders.	OK. It has been revised and verified by CTI by checking updated MR and through interview during on-site visit. Therefore, CL 01 is closed.

CL ID	Clarification Request	Response by Project Proponent	Verification Team Assessment
CL 02	MR (version 01 dated 01/08/2022) lacks the information on type, accuracy class, and serial number of monitoring equipment as well as the calibration date and validity of each calibration, thus, CL02 was raised to clarify.	The type, accuracy class, SN of the monitoring equipment and the calibration information have been displayed in the updated MR.	OK. It has been revised and verified by CTI by checking updated MR, nameplates of the monitoring equipments and the calibration reports during on-site visit. Therefore, CL 02 is closed.

Table 3: Forward Action Requests

FAR ID	Forward Action Request	Response by Project Proponent	Verification Team Assessment
NA	NA	NA	NA