

# VERIFICATION REPORT

VE-UER-049-II

**Verification of Upstream GHG  
Emission Reductions for project:**

**«Zhuangsanlian Associated Gas Recovery and  
Utilization Project»**

**For the period: 01/01/2021 to 31/12/2021**

**Monitoring Period Number: 2  
certifying the UER batch**

**0049\_VERI\_20181120\_2021\_035.8816N,108.1773E\_000000,013543**

**According to  
Austrian 'Kraftstoffverordnung' dated 24/June/2020 and  
ISO14064 Part 2**

**Version 1.0. dated 11 October 2022**

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## Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
EU ETS	European Union Emissions Trading Scheme
FAR	Forward Action Request
FQD	Fuel Quality Directive
GHG	Greenhouse Gases
ISO	International Standard Organisation
KVO	Austrian Kraftstoffverordnung
MR	Monitoring Report
NCV	Net Calorific Value
NDC	Nationally Determined Contributions
OMV	OMV Downstream GmbH
PA	Paris Agreement
PDD	Project design Document
TR	Technical Reviewer
UER	Upstream Emission Reductions
UNFCCC	United Nations Framework Convention on Climate Change

## 1. Scope of the Verification

Verico SCE, an accredited verification body<sup>1</sup> according to DIN EN ISO 14065 including the validation and verification of GHG assertions based on ISO 14064 Part 1 or Part 2, has been ordered to perform a verification of a monitoring report for the project: «ISO 14064:2 GHG Emission Reduction project – Zhuangsanlian Associated Gas Recovery and Utilization Project» in order to confirm compliance of the monitoring report with requirements as set by ISO 14064 Part 2, and Austrian Kraftstoffverordnung (KVO) dated 24 June 2020 implementing the Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC (Fuel Quality Directive) of the European Parliament and of the Council relating to the quality of petrol and diesel fuels having regard to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (1). This verification activity addresses in particular:

- implementation of the project in accordance with the validated project design document (PDD version 3 dated 11 September 2020; and
- amount of emission reductions achieved during the 2<sup>nd</sup> monitoring period (1 January 2021 – 31 December 2021).

verico SCE performed all tasks as specified under ISO 14064 Part 3, thus undertaking a systematic, independent and documented process for the evaluation of a greenhouse gas assertion of the above-mentioned project activity against the agreed verification criteria through this verification report. The main objective of this activity is the use of the verification report by the orderer for the creation of UERs that are eligible under the FQD regulation. The process of UER creation requires verification as shown in the third step of the graph on the right. All consecutive steps fall under the responsibility of the fuel supplier using UERs and are not part of this engagement.

verico SCE has nominated a verification team fulfilling the internal qualification criteria based on ISO 14064 Part 3, ISO 14065 and ISO 14066. The verification process involved an in-depth review of the submitted set of documentation and records as well as background research regarding applied technologies and country-specific circumstances among others. Following a strategic analysis and the determination of assessment risks, a detailed verification plan has been developed.

The verification by a member of the verification team with appointment as lead verifier and covering all competences in the relevant sectoral scopes included web-conferences/emails interchange, with all the personnel involved in the GHG emissions reduction project. A finding list has been provided to the orderer who subsequently revised the documentation. The revised documentation underwent a further review before issuing this final verification report.

The verification statement is given at a reasonable level of assurance. When verifying reported data, a 0.5% materiality threshold has been applied with regard to the total amount of emission reductions thus enabling to confirm that the reported emission reductions are of equivalent confidence as of Commission Regulations (EU) No 600/2012.

The verification has been carried out in the period from 5<sup>th</sup> September 2022 to 11<sup>th</sup> October 2022.

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<sup>1</sup> DAkkS Accreditation ID D-VS-19003-01-01



## 2. Project Details

<b>Project Title</b>	ISO 14064:2 GHG project: Zhuangsanlian Associated Gas Recovery and Utilization Project				
<b>Brief Description</b>	<p>The purpose of the project activity is to recover the associated gas from remote &amp; scattered oil wells in Changqing Oilfield that would be flared in the absence of the project activity, and to process the recovered gas into dry natural gas and light hydrocarbon.</p> <p>The project activity includes the installation of an associated gas recovery, processing and transportation system and three sets of 450kW natural gas power generation units (2 for operation and 1 for backup). The associated gas recovered from oil wells are to be pre-treated, including dehydration, purification, compression and condensate-separation and then generated into dry natural gas and light hydrocarbon. The light hydrocarbons are used for external supply, while the dry gas is consumed by the on-site gas-fired generators and other heating equipment to meet the energy demand.</p> <p>The project started commissioning in November 2018, and the estimated annual processing capacity of the associated gas is <math>9.9 \times 10^6 \text{ Nm}^3</math> with the annual emission reductions of 12,892 tCO<sub>2</sub>e.</p> <p>From 20/02/2021 onwards, a part of produced dry gas was exported to the nearby processing station i.e. Zhuangsanlian Phase II (referred to as “the project B”) for producing CNG, thus for avoiding double counting, project emissions from gas-fired generators and leakage emission from CNG is considered for the project B only.</p> <p>During the 2<sup>nd</sup> monitoring period from 01/01/2021 to 31/12/2021, totally 5,431,476 Nm<sup>3</sup> associated gas was recovered, and 13,543 tCO<sub>2</sub> emission reductions were achieved.</p>				
<b>Project site</b>	<p>Coordinates of the physical site of the project</p> <table border="1" data-bbox="550 1464 1082 1581"> <tr> <td><b>Longitude:</b></td> <td>108.1773° E</td> </tr> <tr> <td><b>Latitude:</b></td> <td>35.8816° N</td> </tr> </table>	<b>Longitude:</b>	108.1773° E	<b>Latitude:</b>	35.8816° N
<b>Longitude:</b>	108.1773° E				
<b>Latitude:</b>	35.8816° N				
<b>Project Proponent / Operator</b>	Sinopec Xinxing Shaanxi Xinyuan Technology Co. Ltd. Tianlang Jingkai Center, No.55 of Mingguang Road, Economic and Technology Development Zone; Xi'an City, Shaanxi Province, China				
<b>UER owner/buyer</b>	OMV Downstream GmbH Trabrennstraße 6-8, 1020 Wien / Vienna, Austria				
<b>Validated PDD incl. Monitoring Plan</b>	Version 3 dated 11 September 2020				
<b>Final version of the Monitoring Report</b>	UER Monitoring Report (MR2) Version 1.1 dated 29 September 2022				

<b>Applied methodology</b>	CDM methodology AM0009 "Recovery and utilization of gas from oil fields that would otherwise be flared or vented" Version 07.0
<b>Monitoring Period</b>	01/01/2021 to 31/12/2021 (both dates included)
<b>Certified UERs</b>	<b>13,543 tCO<sub>2</sub>e</b>
<b>UER batch</b>	<b>0049_VERI_20181120_2021_035.8816N,108.1773E_000000,013543</b>

### 3. Assessment Approach

#### a. Contract Review

Based on submitted information on the project idea, its location, relevant stakeholders and the applied methodology, it was agreed to execute the project under an extension of the framework contract for UER activities closed with OMV Downstream GmbH (OMV). Addendum to this framework contract was accepted by OMV purchase order. The scope of accreditation of verico SCE as accredited validation and verification body covers all relevant scopes (here CDM scope 1 and 10) of this project activity, and verico SCE has access to auditors covering the required competences in the sectors related for this activity. The contract complies with the internal requirements of the validation and verification body. The cost estimate ensured that the required personnel and time resources were available for processing. The client confirmed the independence of the verification team members and verico SCE in writing.

#### b. Assessment Team

##### Lead Auditor:

Jing (Robin) Wang                      ISO14064-2 CDM Scopes: 1,3, 8, 10

##### Auditor(s):

Sven Starckx                                ISO14064-2 CDM Scopes: 1,3,4,5,8,9,10,13

The appointment certificates confirming the qualification of the team members are provided under Annex 5 of this report.

### c. Preparation of the Assessment

The verification criteria were agreed between the client and verico SCE prior to the assessment as the verification of the monitoring report to meet the requirements under ISO 14064 Part 2, the Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC (Fuel Quality Directive) of the European Parliament and of the Council relating to the quality of petrol and diesel fuels having regard to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (1).

At the start of this verification activity, the project participants submitted the project documentation and emissions reduction estimations. By reviewing and evaluating these documents a strategic and risk analysis has been performed in order to develop a project-specific assessment plan, that has captured and identified all relevant areas of assessment in order to reduce assessment risks and to enable a statement at a reasonable level of assurance that the project complies with the requirement of ISO 14064 Part 2 (ISO 14064-2).

Verico SCE has been provided with a Monitoring Report version 01 dated 30 August 2022 and underlying data records covering the monitoring period. These documents serve as the basis for the assessment presented herewith. The reporting period starts 1 January 2021 and ends on 31 December 2021 (including the first and last day of this monitoring period).

The following table presents the areas of concern, which needed further investigation beyond the document review, the associated risks which might result in non-compliance and the initially selected assessment methods. This list has been prepared before drafting a detailed verification plan for the web-based interviews and the following on-site mission.

Area of Concern	Risk	Assessment method
Technical /physical project boundaries	Connected oil wells and Gas recovery with respect to Points to monitor the volume of recovered gas and dry gas consumption; metering the grid power consumed by the project activity for the respective processing stations; which are set corresponding to all material flows including on-site consumption.	Interview and inspection of <ul style="list-style-type: none"> <li>Evidence/s presented on engineering and procurement contract reports</li> <li>Feasibility Study Report,</li> <li>Proofs regarding amount flared in historical circumstances</li> </ul> Physical visit by the lead auditor
Correctness of underlying data	Use of inappropriate calculations Incorrect conclusions	Data verification
Implementation of the approved monitoring plan	Any binding requirements from validation of the validated PDD / registration scheme	Audit Inspection Document review
Calculations / estimations	Excel sheets for ER calculation Data correctness and quality, and estimations	Review of excel files (initial and final versions) Historic records
Project Emissions	Quality of recovered gas Onsite Dry Gas consumption Grid power consumed	Inspection Document review and evidence thereof



Area of Concern	Risk	Assessment method
Leakage Emissions	Not considered acc. to validated PDD From 20/02/2021 onward, a part of produced dry gas has been exporting to the nearby processing station i.e. Zhuangsanlian Phase II (hereinafter referred to as “the project B”) for producing CNG, thus for avoiding double counting, the leakage emission from CNG is considered for the project B only.	n.a.
Monitoring Plan	Identification of Key instruments Correct monitoring locations Monitoring Parameters	Review of excel-tables Documentation Review Interview
Environmental integrity	Appropriate approvals	Interview Document review
Quality assurance / quality control	Data quality of ER calculations Calibration records	Inspection Document review

#### d. Verification Audits

A verification audit including on-site inspections took place on 5 September 2022. During the audit, interviews and document reviews were conducted.

A Finding list was issued, and some editorial and other minor errors were discussed with the project participants resulting in a need for revising the Monitoring Report. Further proofs and a revised version of the Monitoring Report, labelled as version 1.1 dated 29 September 2022 have delivered subsequently. All proofs (records, photos, databases, documents) have been checked during the second round of the audit process. A list of reviewed documents is provided in Annex 3 of this Verification Report.

Annex 4 to this report provides a list of interviewed persons.

The following figure provides some impressions of points discussed during the audits:





Image 1: The gate of the station

Image 2: The processing units of the station



Image 3: The gas-fired generators

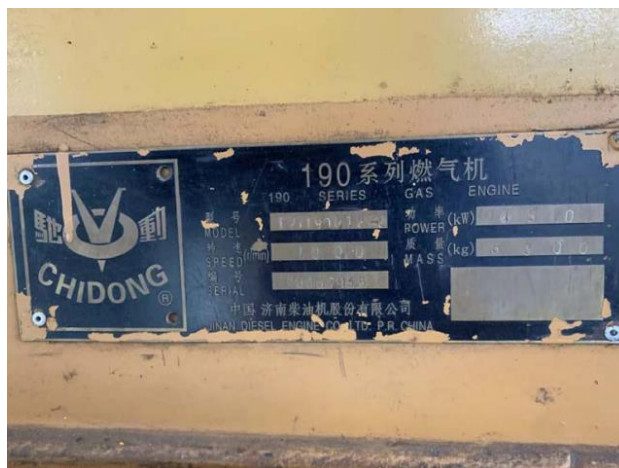


Image 4: The nameplate of the generators



Image 5: The Vortex Flowmeter at point F



Image 6: The Vortex Flowmeter at point D

### e. Specific assessment plan for the facility

Together with the verification process, the checklist as referred to under 3.c. has been completed with information collected and verified during documents reviews and both on-line audits and indicates the details of findings/confirmations. The checklist and the collected information and documents remain as internal verification documentation at verico SCE. The project-specific checklist with the final results is provided in Annex 1 of this Verification Report.



## **f. Follow-up of Revisions**

After the delivery of requested further evidence and the revision of the project documentation addressing the identified non-compliances, a further round of desk reviews has taken place, assessing these submissions. All final assessments regarding the closure of findings is documented under the finding list, attached as Annex 2 to this report.

## **g. Technical Review**

Before the report is approved, an internal review is conducted by a lead auditor (Technical Reviewer) assigned to it by the verification body who was not himself a member of the audit team. The main focus of this process is the assessment of the completeness and traceability of the validation carried out on the basis of the internal and external validation report. If necessary, the validation team will be asked to catch up on missing test steps or to correct or supplement the test report to increase transparency.

This particular review has been conducted by Martin Beckmann, who is appointed as Technical Reviewer of ISO 14064 Part 2 activities, for scopes 1,4,5,8,9,10. His appointment certificate is provided under Annex 5.

# **4. Observations and Findings**

## **a. General Information**

All information regarding the involved project proponents, the organisational arrangements, the daily practice and technical features have been proven to be correct. All procedures relevant to the project have been provided and their application on the project activity properly checked.

The verification focused on the correct implementation of the project (installations, monitoring equipment and procedures, quality assurance procedures), including the correctness of assumptions and calculations with possible impacts on the monitoring and verification process (e.g., uncertainty analysis).

All monitoring activities are either in accordance with the validated project design document, and all information regarding applied procedures, maintenance and data processing is clearly documented.

The project boundaries are clearly established as per the validated PDD version 3 dated 11 September 2020 submitted for validation and the Monitoring Report subject of this verification.

## **b. Legal Requirements**

The project is in compliance with the host country's legislation. All required licenses are available. It is also evident there are no specific legal requirements to deliver the required service in the manner as done by the project activity. Hence the baseline scenario as claimed for in the validated PDD is still deemed being applicable. Thus, it can be confirmed that the baseline identification process by the project proponents and the according validation are both transparently and suitably presented.

There are no legal requirements introduced since validation, which would have changed the conditions for determining the baseline scenario.

### **c. Accuracy and Completeness**

As result of reviewing evidence and pertaining document, it can be confirmed that all relevant parameters for the ex-post determination (quantity of recovered gas and dry gas, grid power consumed by the processing station) have been monitored according to the monitoring plan. This addresses in particular:

- $V_{F,y}$  - Volume of the recovered gas measured at point F by the flowmeter ;
- $FC_{i,j,y}$  - Volume of the dry gas consumption measured at point D by the flowmeter;
- $EC_{PJ,i,y}$  - Quantity of grid power consumption measured at point E by the electricity meter;
- Chemical composition sampled for the recovered gas at point F; and
- Chemical composition sampled for the dry gas at point D.

All parameters within the project boundary are metered at high accuracy. The reported emission reductions are of equivalent confidence as of Commission Regulations (EU) No 600/2012 and No 2067/2018, which contains general principles for verification and the accreditation of verifiers and Commission Regulation (EU) No 601/2012 which contains general principles for monitoring and reporting that can be applied to upstream emission reduction projects.

### **d. Quality assurance / quality management and risk management**

The monitoring system, related procedures and its implementation are in compliance with the requirements set by the underlying regulations and standards. All data which require metering are clearly identified and according arrangements have been made in line with appropriate procedures for data collection and its analysis. All parameters were determined as prescribed in the monitoring plan and associated (inherent) risks have been considered by implementing appropriate maintenance and quality assurance procedures. Reporting procedures reflect the monitoring plan and con-



solidated data and event logs are stored electronically. The necessary internal procedures and additional internal work instructions support the determination of all the parameters listed in the monitoring plan in an effective manner.

### **e. Data gaps and corrections**

The monitoring system, related procedures and its implementation are in compliance with the requirements set by the underlying regulations and standards. All data which require metering are clearly identified and according arrangements have been made in line with appropriate procedures for data collection and its analysis. All parameters were determined as prescribed in the monitoring plan of the validated PDD and associated (inherent) risks have been considered by implementing appropriate maintenance and quality assurance procedures.

Monitored monthly aggregated data of gas volume and chemical composition data is collated to the project operator on the last day of each month for billing purposes. This aggregated data is recorded from daily readings of monitoring instruments and is archived by means of both electronic and paper backup. Typical instruments at the processing station that are linked to the emission estimations/monitoring have been identified in the monitoring plan and whose calibration records were ascertained. These measurement instruments across the station are:

- The flowmeter at point F ;
- The flowmeter at point D ; and
- The electricity meter at point E.

Verification process pay special attention to monitoring instruments at the station, and specifically to gas flow meter at point F for associated gas and at point D for dry gas onsite consumed. The records of past data are maintained in compliance with the legal requirements.

Measurement instruments of the project

Monitoring parameter	Type of meter	Specification	S/N	Accuracy	Calibration date		Valid period
$V_{F,y}$	Vortex flowmeter	LUXB-DN150	YK1805024	1.5	1 <sup>st</sup>	27/10/2019	26/10/2021
					2 <sup>nd</sup>	21/10/2021	20/10/2023
$FC_{i,y}$	Vortex flowmeter	LUXB-DN65	YK1805025	1.5	1 <sup>st</sup>	27/10/2019	26/10/2021
					2 <sup>nd</sup>	21/10/2021	20/10/2023
$EC_{P,j,y}$	Electrical meter	DSS196	2018-01010187	1.0	1 <sup>st</sup>	26/11/2019	25/11/2021
					2 <sup>nd</sup>	21/10/2021	20/10/2023

The specification and instruction manuals have been checked and found that the flowmeters have built-in pressure (P), temperature (T) and volume flow (V) sensors (RS485 protocol), which integrate pressure and temperature detection and compensation calculation, so they can directly measure volume flow and accumulated flow under standard conditions.

No data gaps were detected during the monitoring period under verification. It can therefore be concluded by a high level of assurance that the implemented monitoring plan has performed as to ensure a proper monitoring of emission reductions towards ensuring the verifiability of monitoring report for the period 01/01/2021 until 31/12/2021 .

## f. Assessment of Uncertainties

Project-specific uncertainty analysis has been performed confirming that the Monitoring Report meets the uncertainty requirements as specified by the EU ETS. The verification process included a check of the uncertainty of individual meters and manufactures' instruction manual. The uncertainty assessment of the volume of recovered gas has been verified to be +/- 1.5% and found in compliance with the highest tier (Tier 4) requirements (+/-1.5%) of Commission Regulation (EU) No 601/2012.

## g. Findings and Non-Conformities

To evaluate whether the requested confirmation can be given, verico SCE established a checklist and conducted a specific analysis. A confirmation was made and attached to the verification report.

No Forward Action Requests during the previous verification have been issued.

Three (3) CLs were issued during this verification.

CL#01 and CL#02 were about the extension of the monitoring system since the operation of the project B on 20/02/2021 and the resulting monitoring approaches of Project emissions. In response to CLs, the operator applied a more complete monitoring system with a series of measurement points for both the project and the nearby project B for determining Project emissions, which is deemed acceptable and ensures conservativeness of the emission reduction estimation.

CL#03 was raised to clarify whether the instrument has automatic compensation functions for pressure and temperature to meet the requirements for measurement accuracy. It was closed after the instruction manual with the necessary functions of the flowmeters was provided.

#### **h. Recommendations for Improvements**

n/a

## 5. Verification Statement

Verico SCE has undertaken the verification of the GHG emission reduction project «Zhuangsanlian Associated Gas Recovery and Utilization Project» located in the China and implemented by the project proponent «Sinopec Xinxing Shaanxi Xinyuan Technology Co. Ltd.», covering the monitoring period from 1 January 2021 to 31 December 2021 in accordance with:

- the registered project documentation;
- the requirements of ISO 14064 Part 2;
- the Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC (Fuel Quality Directive) of the European Parliament and of the Council relating to the quality of petrol and diesel fuels having regard to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (1); and
- the KVO.

The project will reduce emissions by recovering and utilizing the associated gas from oil fields, currently being flared and processing the recovered gas into hydrocarbon products. The preconditions for approval were still present in relation to the project activity during the verification period. The project activity has been carried out in accordance with the project documentation.

Through the verification process, the verification team identified three Clarification Requests. No findings were left unsolved or remaining at the issuance of the verification statement.

The verification team is therefore of the opinion that the GHG Assertion of the project «Zhuangsanlian Associated Gas Recovery and Utilization Project» is implemented as planned and described in the project design document, and that it is in accordance with the underlying requirements. All monitored data and calculation of emissions or removals have been assessed and it can be confirmed at a reasonable level of assurance, that the data is free from material misstatements.

Therefore, verico SCE hereby certifies at a reasonable level of assurance that the upstream emissions reductions or removals enhancements of the GHG project «Zhuangsanlian Associated Gas Recovery and Utilization Project» during the monitoring period from 1 January 2021 to 31 December 2021 amounts to:

**13,543 tCO<sub>2e</sub>**



The reported emission reductions are of equivalent confidence as of Commission Regulations (EU) No 600/2012 and No 2067/2018, which contains general principles for verification and the accreditation of verifiers and Commission Regulation (EU) No 601/2012 which contains general principles for monitoring and reporting that can be applied to upstream emission reduction projects.

Therefore, verico SCE hereby certifies at a reasonable level of assurance that the unique UER batch(es)

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is (are) established exclusively on verified emission reductions achieved in a contiguous time period in the calendar year 2021 by the GHG project «Zhuangsanlian Associated Gas Recovery and Utilization Project».

*Martin Beckmann*  
Martin Beckmann (Oct 28, 2022 10:51 GMT+2)

Beijing 11.10.2022

Berlin, 14.10.2022

A stylized, handwritten signature in black ink, consisting of several loops and curves.A handwritten signature in blue ink, appearing to read "M. Beckmann" with a large, flowing flourish.

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Robin Wang  
**Lead Auditor**

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Martin Beckmann  
**Technical Reviewer**

Released:

Langenbach, 14.10.2022

**Werner  
Betzenbichler** Digital unterschrieben  
von Werner Betzenbichler  
Datum: 2022.10.28  
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Werner Betzenbichler  
Verification Body verico SCE

# Annex 1

## Checklist of the Verification Assessment Plan



### Forward Action Requests and Issues remaining from Validation or previous Verification

Forward Action Request	Verified situation	Concl.
Not applicable	N/A	OK

### SECTION 1. Project plan (Project description)

Requirement	Verified situation	Concl.
<b>General description of the project</b>		
1.1. Does the GHG Report provide general information of the project?	The UER Monitoring Report “Zhuangsanlian Associated Gas Recovery and Utilization Project “  For the 2 <sup>nd</sup> monitoring period 01/01/2021 to 31/12/2021, the final Monitoring Report version 1.1 dated 29/09/2022 presented general information of the project and found the consistency with the PDD version 3 dated 11/09/2020.	OK
1.2. Is there any open issue in the validation / previous verification?	The validation report of the project has been checked and no open issue was found.	OK
<b>Implementation status of the project activity</b>		
1.3. Is the project location indicated? Confirm geographical coordinates	Coordinates of the project site have been included in the final Monitoring Report version 1.1 dated 29/09/2022.  It was compared with that in the Validation Report (VS-3291941) dated 14/09/2020 and found the same.	OK

Requirement	Verified situation	Concl.
	The coordinates were also confirmed through on-site inspection by Google GPS during onsite inspection.	
1.4. Are all GHG sources relevant to the project identified? Is any emission source missed? Check the site lay-out and confirm through site tour.	<p>Project boundary is well covered and identified all the GHG sources such as the location of the Point F, the point D and the point E respectively, as applicable.</p> <p>This physical infrastructure and processes were confirmed through on-site inspection.</p> <p>Since there were still surplus associated gas not recovered by the project which would be flared on-site, the project owner has implemented a new project in 2021 to recover the surplus associated gas from Changqing Oilfield. The new project Zhuangsanlian Phase II Associated Gas Recovery and Utilization Project (hereinafter referred to as “the project B”) is located nearby the project and has a similar processing system except for a larger recovery capacity, and a newly built CNG station. The project B has been constructed to process the surplus dry gas into CNG, including a part of dry gas processed by the project and all the dry gas processed by the project B.</p> <p>Therefore, the dry gas for on-site consumption of the project measured at the point D should be deducted by the dry gas fed into the project B for CNG production.</p> <p>With regard to Project emissions by on-site consumption of fossil fuel, the dry gas exported by the project was mixed with the dry gas processed in the project B, which cannot be monitored separately. Considering the project B is also applying for UER registration, the total dry gas for on-site consumption by both the project and the project B from 20/02/2021 forward was counted to the project B for avoiding double counting. Subsequently, the Leakage Emissions from CNG is considered for the project B only.</p>	<p><b>CL#01</b> <b>CL#02</b></p> <p>OK</p>



Requirement	Verified situation	Concl.
	<p><b>CL#01</b> was raised for incomplete layout illustration (Figure 2-1 Schematic illustration of project boundary) that needs to combine the project and the project B,</p> <p>It was closed after the Figure 2-1 updated to cover the monitoring system for both the project and the project B. According to the whole monitoring system, Project emissions resulted from the on-site dry gas consumption by both the project and project B, can be counted to the project B based on the monitored data by flowmeters at point D, point J and point I.</p> <p><b>CL#02</b> was raised for incomplete description of monitoring the volume of the dry gas fed into the project B for CNG production from 20/02/2021, e.g. the corresponding flowmeter and calculation approaches etc.</p> <p>It was closed after corresponding flowmeter and calculation approaches for the volume of the dry gas consumed by the two projects have been added in the section 3.3 monitoring plan of the last version of the MR.</p>	
<p>1.5. Confirm conformance with GHG program requirements: baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the project activity meets all the requirements.</p>	<p>The project has correctly applied the methodological requirements that were covered by the validated PDD.</p>	<p>OK</p>
<p>1.6. By means of an on-site visit:</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed project are in place and operated according with the GHG program requirements.</p> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random</p>	<p>The existence of the piping system and technical components as flow meters and sampling points were verified by the lead auditor. It can therefore be demonstrated that all physical features including the relevant meters are in place.</p> <p>All relevant flows and technical components are displayed in relevant tables including in a graphic scheme as Figure 3.2 "Monitoring diagram of the project" of the last version of the MR.</p>	<p>OK</p>

Requirement	Verified situation	Concl.
<p>sampling check shall be performed. Justify here the sample chosen and describe the results.</p>	<p>The existence of the piping system and the technical components as well as the flow meters with sampling points both of the project and the project B were verified by the Lead Auditor. It can therefore be demonstrated that all physical feature including the relevant meters are in place.</p>	
<p>1.7. Have responsibilities for monitoring been described and specified?</p>	<p>Responsibilities and functions are described with the Monitoring Report and conform to the actual situation described in the validated PDD and the last version of the MR.</p> <p>Information is included in Monitoring Report Section 3.3 “Management structure and responsibilities” including additional evidences were presented in support of the project implemented project quality system</p>	OK
<p>1.8. Check QA/QC, management systems. Are procedures described and specified? Are they consistently applied?</p> <ul style="list-style-type: none"> <li>• documented instructions, management manual</li> <li>• documentation</li> <li>• data archiving</li> <li>• monitoring report</li> <li>• cross-checking</li> <li>• energy balance analysis (as relevant)</li> <li>• internal audits / verification and management review</li> </ul>	<p>The last version of the MR clearly establishes the organizational structure and management roles and responsibilities in the documentation, data and information collection, monitoring and its archiving.</p> <p>The monitoring produces a continuous measurement of the recovered gas at point F and dry gas point D by flowmeters, as well as grid power consumed by the project at point E (appropriately function and numbered), which readings are recorded once a month as aggregated data.</p> <p>The parameters are as below,</p> <ul style="list-style-type: none"> <li>➤ <math>V_{F,y}</math> - Volume of the recovered gas measured at point F by the flowmeter ;</li> <li>➤ <math>FC_{i,j,y}</math> - Volume of the dry gas consumption measured at point D by the flowmeter;</li> </ul>	OK

Requirement	Verified situation	Concl.
	<ul style="list-style-type: none"> <li>➤ <math>EC_{PJ,i,y}</math> - Quantity of grid power consumption measured at point E by the electricity meter;</li> <li>➤ Chemical composition sampled for the recovered gas at point F; and</li> <li>➤ Chemical composition sampled for the dry gas at point D.</li> </ul> <p>The gas sampling was carried out by an authorized laboratory for chemical analysis following national standards GB/T 13610-2014 and GB/T 11062-2020.</p>	
1.9. Has a procedure for emergency and abnormal situations been established?	<p>Procedures were verified and confirmed by the lead auditor.</p> <p>Data have been recorded from readings of monitoring instruments and archived for 5 years following the end of the monitoring period by means of electronic and paper backup.</p>	OK
1.10. Has the system for qualification and training been established as relevant for the monitoring and management activities?	Training records and qualification of monitoring personnel were verified and found in place.	OK
1.11. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	<p>The proof has been submitted and checked accordingly.</p> <ul style="list-style-type: none"> <li>➤ The approval of Environment Impact Analysis of the project</li> </ul>	OK
1.12. Check contribution to sustainable development, in accordance with the GHG program.	Not applicable	OK
1.13. Check issues with local stakeholders, claims, complaints, etc.	Not relevant at the time of the 2 <sup>nd</sup> monitoring period	OK



## SECTION 2. Quantifying GHG emissions and/or removals

Requirement	Verified situation	Concl.
2.1. Is the project location indicated? Confirm geographical coordinates?	There is no any change to the validated PDD. The details of project location are described appropriately in the last version of the MR.	OK
2.2. Are all GHG sources relevant to the project identified? Is any emission source missed? Check the site lay-out and confirm through site tour.	During the 2 <sup>nd</sup> monitoring period, there is a mixing of the dry gas system with the nearby newly built station i.e. the project B. Hence the monitoring system is necessary to cover the project B.  See <b>CL#01</b> and <b>CL#02</b> .	OK
2.3. Confirm conformance with GHG program requirements: baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the project activity meets all the requirements.	<p>As per the validated PDD Version 3 dated 11/09/2020 and the validation report (no.TS-3291941) dated 14/09/2020.</p> <p>As the opinions in the validation report, the Option A of the Methodological Tool 03 -- <i>Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion</i>--- Version 03.0 can be applied for the calculation methods of <b>BE</b> and <b>PE</b>, i.e. using parameters</p> <p><math>w_C</math> - weighted average mass fraction of carbon in fuel type (tC/volume unit of the fuel) and</p> <p><math>p_C</math> - weighted average density of fuel type (volume unit of the fuel)</p> <p>as an alternative to the AM0009 that uses sampled <i>NCV (net calorific value)</i> and default value <math>EF_{CO_2, methane}</math>.</p> <p>As a consequence, for parameter <math>w_{C,F,y}</math> for recovered gas and <math>w_{C,i,y}</math> for dry gas, Gas samples should regularly be taken at the corresponding location as</p> <p>Figure 3-1 of the PDD and the molar composition of each gas sample should be determined through chemical analysis following the relevant national standards (GB/T 13610-2014 <i>Analysis of natural gas composition-Gas chromatography</i> and GB/T11062-2014 <i>Natural gas-Calculation of calorific values, density, relative density and Wobbe index</i>).</p>	OK



Requirement	Verified situation	Concl.
	<p>Based on the molar composition, the carbon content should be determined for each sample in line with EN 15984-2017 or an equivalent standard for a combustion reference temperature of 20°C and the same metering reference condition used for parameter <math>V_{F,y}</math>.</p> <p>For parameter <math>p_{C,F,y}</math> for recovered gas and <math>p_{C,i,y}</math> for dry gas, Gas samples should regularly be taken at the corresponding location as Figure 3-1 of the PDD and the density of each gas sample should be determined through chemical analysis following the relevant national standards (GB/T13610-2014 <i>Analysis of natural gas composition-Gas chromatography</i> and GB/T11062-2014 <i>Natural gas-Calculation of calorific values, density, relative density and Wobbe index</i>)</p>	
<p>2.4. By means of an on-site visit:</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed project are in place and operated according with the GHG program requirements.</p> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.</p>	<p>All information is consistent with layout of the project site with technical component list presented with the last version of the MR.</p> <p>Components and equipment were verified against the technical information of the layout of the project site provided by project proponent .</p> <p>The relevant supporting evidences including</p> <ul style="list-style-type: none"> <li>➤ Layout of processing system ;</li> <li>➤ Reading records of volume of recovered gas;</li> <li>➤ Power consumption by the gas station;</li> <li>➤ Records of dry gas consumption;</li> <li>➤ Relevant receipts / bills;</li> <li>➤ calibration reports of flowmeters and electricity meters.</li> </ul> <p>It can be confirmed that the monitoring data in this reporting period was transparent and accurate.</p>	OK
<p>2.5. List any monitoring aspect that is not specified in the criteria, procedure and/or methodology and check its compliance with the GHG program, for example:</p>	<p>There are no additional aspects except for dry gas consumed by gas generators ( <math>FC_{i,j,y}</math> ) and grid power consumed by the processing station( <math>EC_{PJ,j,y}</math> ).</p>	OK



Requirement	Verified situation	Concl.																																					
<ul style="list-style-type: none"> <li>additional monitoring parameters</li> <li>monitoring frequency</li> <li>calibration frequency.</li> </ul>	<p>As described in Section 3.2. Data and Parameters Monitored of the last version of the MR.</p> <p>See <b>CL#02</b> above.</p>																																						
<p>2.6. Has the data been generated at the frequency required by the applied criteria, procedure and or methodology?</p>	<p>Annual calibration is conducted for all key instrumentation identified by the project proponent with appropriate evidences.</p> <p style="text-align: center;">Measurement instruments of the project</p> <table border="1" data-bbox="931 616 1805 1051"> <thead> <tr> <th data-bbox="931 616 1070 730">Monitoring parameter</th> <th data-bbox="1070 616 1189 730">Type of meter</th> <th data-bbox="1189 616 1391 730">Specification / SN</th> <th data-bbox="1391 616 1469 730">Accu.</th> <th colspan="2" data-bbox="1469 616 1659 730">Calibration date</th> <th data-bbox="1659 616 1805 730">Valid period</th> </tr> </thead> <tbody> <tr> <td data-bbox="931 730 1070 839" rowspan="2"><math>V_{F,y}</math></td> <td data-bbox="1070 730 1189 839" rowspan="2">Vortex flowmeter</td> <td data-bbox="1189 730 1391 839" rowspan="2">LUXB-DN150 /YK1805024</td> <td data-bbox="1391 730 1469 839" rowspan="2">1.5</td> <td data-bbox="1469 730 1525 783">1<sup>st</sup></td> <td data-bbox="1525 730 1659 783">27/10/2019</td> <td data-bbox="1659 730 1805 783">26/10/2021</td> </tr> <tr> <td data-bbox="1469 783 1525 839">2<sup>nd</sup></td> <td data-bbox="1525 783 1659 839">21/10/2021</td> <td data-bbox="1659 783 1805 839">20/10/2023</td> </tr> <tr> <td data-bbox="931 839 1070 948" rowspan="2"><math>FC_{i,y}</math></td> <td data-bbox="1070 839 1189 948" rowspan="2">Vortex flowmeter</td> <td data-bbox="1189 839 1391 948" rowspan="2">LUXB-DN65 /YK1805025</td> <td data-bbox="1391 839 1469 948" rowspan="2">1.5</td> <td data-bbox="1469 839 1525 892">1<sup>st</sup></td> <td data-bbox="1525 839 1659 892">27/10/2019</td> <td data-bbox="1659 839 1805 892">26/10/2021</td> </tr> <tr> <td data-bbox="1469 892 1525 948">2<sup>nd</sup></td> <td data-bbox="1525 892 1659 948">21/10/2021</td> <td data-bbox="1659 892 1805 948">20/10/2023</td> </tr> <tr> <td data-bbox="931 948 1070 1051" rowspan="2"><math>EC_{P,J,j,y}</math></td> <td data-bbox="1070 948 1189 1051" rowspan="2">Electrical meter</td> <td data-bbox="1189 948 1391 1051" rowspan="2">DSS196 /201801010187</td> <td data-bbox="1391 948 1469 1051" rowspan="2">1.0</td> <td data-bbox="1469 948 1525 1000">1<sup>st</sup></td> <td data-bbox="1525 948 1659 1000">26/11/2019</td> <td data-bbox="1659 948 1805 1000">25/11/2021</td> </tr> <tr> <td data-bbox="1469 1000 1525 1051">2<sup>nd</sup></td> <td data-bbox="1525 1000 1659 1051">21/10/2021</td> <td data-bbox="1659 1000 1805 1051">20/10/2023</td> </tr> </tbody> </table> <p>This Monitoring period under the Monitoring Report is properly covered by those calibrations (once two years).</p>	Monitoring parameter	Type of meter	Specification / SN	Accu.	Calibration date		Valid period	$V_{F,y}$	Vortex flowmeter	LUXB-DN150 /YK1805024	1.5	1 <sup>st</sup>	27/10/2019	26/10/2021	2 <sup>nd</sup>	21/10/2021	20/10/2023	$FC_{i,y}$	Vortex flowmeter	LUXB-DN65 /YK1805025	1.5	1 <sup>st</sup>	27/10/2019	26/10/2021	2 <sup>nd</sup>	21/10/2021	20/10/2023	$EC_{P,J,j,y}$	Electrical meter	DSS196 /201801010187	1.0	1 <sup>st</sup>	26/11/2019	25/11/2021	2 <sup>nd</sup>	21/10/2021	20/10/2023	OK
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<p>2.7. Have types of measurement instrumentation used been described and specified?</p>	<p>Vortex flowmeters are installed for monitoring gas volume, and electricity meter for electricity from the grid (NWPG).</p> <p>For the description of the flowmeter, <b>CL#03</b> is raised, i.e. whether there are automatic compensations for P and T, to meet the requirements of measurement accuracy.</p>	<p><b>CL#03</b> OK</p>																																					

Requirement	Verified situation	Concl.
	It was closed after the necessary clarification added in the updated MR as per the instruction manuals of the flowmeters. It is found that the proper functions of automatic compensation are based on the sensors built-in, and the readings of the flowmeters are the volume under standard condition.	
<p>2.8. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated according to current good practice? Check relevance of maintenance and calibration.</p> <p>Check relevance of laboratory analysis if necessary.</p>	<p>As per above</p> <p>The valid period of flow-meters calibration is two years, in accordance with national standard “JJG 1121-2015 Verification Regulation of Vortex Flowmeters”</p> <p>The valid period of electrical-meters calibration is two years. in accordance with national standard “JJG596-2012 Verification Regulation of Electrical Meters for Measuring Alternating-current Electrical Energy”</p> <p>The calibration body holds accreditation under ISO17025 within valid period.</p>	OK
<p>2.9. Check responsibilities and authorities for monitoring and reporting. Are the monitoring results consistently recorded, reviewed and approved?</p>	Satisfactorily. As per above	OK
2.10. Reporting period: Defined?	01/01/2021–31/12/2021 as per Monitoring Report for 2 <sup>nd</sup> MP and calculations.	OK
2.11. If the GHG program includes the determination of environmental and/or social indicators, have the sustainable development indicators been monitored?	Not relevant	OK
<p>2.12. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>implementation of measures</li> </ul>	Not relevant	OK



Requirement	Verified situation	Concl.
<ul style="list-style-type: none"><li data-bbox="309 169 640 197">• monitoring equipment</li><li data-bbox="309 229 741 258">• quality assurance procedures</li><li data-bbox="309 290 533 319">• external data.</li></ul>		





Monitoring procedures	Verified situation	Concl.
Confirm that the Monitoring procedure contains all the necessary parameters and that they are monitored in accordance with the GHG program using the following table:	See table below	

Parameter	Units	Monitoring Methodology	Verified situation	Concl.
Volume of the total recovered gas measured at point F by the flowmeter $V_{F,y}$	Nm <sup>3</sup>	<input type="checkbox"/> Estimation <input type="checkbox"/> Modelling <input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Calculation <input type="checkbox"/> Other:	The approach meets the data quality requirements comparable to the EU ETS.	OK
$W_{C,F,y}$ -- The weighted average mass fraction of carbon in recovered associated gas at point F in year y  $\rho_{F,y}$ -- The weighted average density of recovered associated gas at point F in year y	tC/ t  kg/m <sup>3</sup>	<input type="checkbox"/> Estimation <input type="checkbox"/> Modelling <input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Calculation <input checked="" type="checkbox"/> Other: lab analysis	The approach meets the data quality requirements comparable to the EU ETS.	OK

Parameter	Units	Monitoring Methodology	Verified situation	Concl.
<p>Volume of dry gas combusted in the on-site back-up gas-fired generator, measured at point D</p> <p><math>FC_{i,j,y}</math></p>	Nm <sup>3</sup>	<input type="checkbox"/> Estimation <input type="checkbox"/> Modelling <input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Calculation <input type="checkbox"/> Other:	The approach meets the data quality requirements comparable to the EU ETS.	OK
<p><math>w_{C,i,y}</math> --</p> <p>The weighted average mass fraction of carbon in dry gas at point D in year y</p> <p><math>\rho_{i,y}</math> --</p> <p>The weighted average density of dry gas at point D in year y</p>	<p>tC/ t</p> <p>kg/m<sup>3</sup></p>	<input type="checkbox"/> Estimation <input type="checkbox"/> Modelling <input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Calculation <input checked="" type="checkbox"/> Other: lab analysis	The approach meets the data quality requirements comparable to the EU ETS.	OK
<p>Quantity of electricity consumed by the project activity source j in year y by the electricity meter</p> <p><math>EC_{PJ,j,y}</math></p>	MWh	<input type="checkbox"/> Estimation <input type="checkbox"/> Modelling <input checked="" type="checkbox"/> Measurement <input type="checkbox"/> Calculation <input type="checkbox"/> Other:	The approach meets the data quality requirements comparable to the EU ETS.	OK

Monitoring procedures of above parameter	Verified situation	Concl.
<p><b>Implementation of the procedure:</b></p> <p>1. Confirm that the monitoring arrangements described in the monitoring procedure, including roles and responsibilities, are feasible within the project design.</p>	Monitoring arrangements as well as roles and responsibilities have been checked by means of auditable evidence during the verification process.	OK
<p>2. Confirm that the means of implementation of the MP, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by / resulting from the proposed GHG project can be reported ex post and verified.</p>	Management structure and responsibilities for data management and quality assurance are clearly defined and addressed. Based on the consistent data management system and its quality and quality control procedures the emission reductions from the project activity can be reported and verified.	OK

### SECTION 3. Assessment of data and calculation of GHG emission reductions

Requirement	Verified situation	Concl.															
<p>3.1 Have calculations of baseline emissions, project activity emissions and emissions related and/or affected by the GHG project, as appropriate, been carried out in line with the formulae and methods described in the applied criteria, procedure and/or methodology?</p> <p>Check consistency in the ERs spreadsheet</p>	<p>The Excel file used for registration of monitored records and calculation of emissions reductions during the monitored period has been updated to correctly reflect the right parameters of the information provided in the baseline calculation and emission reduction estimations.</p> <table border="1"> <thead> <tr> <th>2<sup>nd</sup> Monitoring Period</th> <th>V<sub>F,y</sub> Nm<sup>3</sup></th> <th>W<sub>C,F,y</sub> tC/t</th> <th>P<sub>F,y</sub> kg/Nm<sup>3</sup></th> <th>BE<sub>y</sub> tCO<sub>2</sub></th> </tr> <tr> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D=A*B*C*44/12/1000</td> </tr> </thead> <tbody> <tr> <td>01/01/2021 to 31/12/2021</td> <td><b>5,431,476</b></td> <td><b>0.7450</b></td> <td><b>1.0326</b></td> <td><b>15,320</b></td> </tr> </tbody> </table>	2 <sup>nd</sup> Monitoring Period	V <sub>F,y</sub> Nm <sup>3</sup>	W <sub>C,F,y</sub> tC/t	P <sub>F,y</sub> kg/Nm <sup>3</sup>	BE <sub>y</sub> tCO <sub>2</sub>		A	B	C	D=A*B*C*44/12/1000	01/01/2021 to 31/12/2021	<b>5,431,476</b>	<b>0.7450</b>	<b>1.0326</b>	<b>15,320</b>	<p><b>CL#01</b> OK</p>
2 <sup>nd</sup> Monitoring Period	V <sub>F,y</sub> Nm <sup>3</sup>	W <sub>C,F,y</sub> tC/t	P <sub>F,y</sub> kg/Nm <sup>3</sup>	BE <sub>y</sub> tCO <sub>2</sub>													
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	<p><math>PE_{CO_2, fossil fuel, y}</math> from dry gas onsite consumption</p> <table border="1"> <thead> <tr> <th rowspan="3">2<sup>nd</sup> Monitoring Period</th> <th><math>FC_{i,j,y}</math></th> <th><math>w_{c,i,y}</math></th> <th><math>\rho_{i,y}</math></th> <th><math>PE_{CO_2, fossil fuels, y}</math></th> </tr> <tr> <th>Nm<sup>3</sup></th> <th>tC/t</th> <th>kg/Nm<sup>3</sup></th> <th>tCO<sub>2</sub></th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D=A*B*C*44/12/1000</th> </tr> </thead> <tbody> <tr> <td>01/01/2021 to 28/02/2021</td> <td>710,594</td> <td>0.6870</td> <td>0.8174</td> <td>1,464</td> </tr> <tr> <td>01/03/2021 to 31/12/2021</td> <td>Counting to project B</td> <td>/</td> <td>/</td> <td>Counting to project B</td> </tr> <tr> <td>01/01/2021 to 31/12/2021</td> <td>710,594</td> <td>0.6870</td> <td>0.8174</td> <td>1,464</td> </tr> </tbody> </table> <p><math>PE_{CO_2, ele, y}</math> from grid power consumption</p> <table border="1"> <thead> <tr> <th rowspan="3">2<sup>nd</sup> Monitoring Period</th> <th><math>EC_{PJ,j,y}</math></th> <th><math>EF_{EF,i,y}</math></th> <th><math>TDL_{i,y}</math></th> <th><math>PE_{CO_2, elec, y}</math></th> </tr> <tr> <th>MMh</th> <th>tCO<sub>2</sub>/MWh</th> <th>%</th> <th>tCO<sub>2</sub></th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D=A*B*(1+C)</th> </tr> </thead> <tbody> <tr> <td>01/01/2021 to 31/12/2021</td> <td>476.400</td> <td>0.61935</td> <td>5.93</td> <td>313</td> </tr> </tbody> </table> <p><math>PE = PE_{CO_2, fossil fuel, y} + PE_{CO_2, ele, y} = 1,464 + 313 = 1,777 \text{ tCO}_2</math></p> <p>The leakage emissions from consumption of electricity and transportation of freight of CNG produced by the project B will be counted totally to the project B. Hence, the project does not involve the leakage calculation in this monitoring period, i.e. <math>LE_y = 0</math></p> <p><b>BE= 15,320,000 kg CO<sub>2e</sub></b></p>	2 <sup>nd</sup> Monitoring Period	$FC_{i,j,y}$	$w_{c,i,y}$	$\rho_{i,y}$	$PE_{CO_2, fossil fuels, y}$	Nm <sup>3</sup>	tC/t	kg/Nm <sup>3</sup>	tCO <sub>2</sub>	A	B	C	D=A*B*C*44/12/1000	01/01/2021 to 28/02/2021	710,594	0.6870	0.8174	1,464	01/03/2021 to 31/12/2021	Counting to project B	/	/	Counting to project B	01/01/2021 to 31/12/2021	710,594	0.6870	0.8174	1,464	2 <sup>nd</sup> Monitoring Period	$EC_{PJ,j,y}$	$EF_{EF,i,y}$	$TDL_{i,y}$	$PE_{CO_2, elec, y}$	MMh	tCO <sub>2</sub> /MWh	%	tCO <sub>2</sub>	A	B	C	D=A*B*(1+C)	01/01/2021 to 31/12/2021	476.400	0.61935	5.93	313	
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Requirement	Verified situation	Concl.
	<p><b>PE= 1,777,000 kg CO<sub>2e</sub></b>  <b>LE= 0 kg CO<sub>2e</sub></b></p> <p><b>ER= 13,543,000 kg CO<sub>2e</sub></b>  <b>= 13,543 t CO<sub>2e</sub></b></p> <p>The annual vintage of the validated PDD:  12,892 t CO<sub>2e</sub></p> <p>The ER achieved in this monitoring period is over the estimated value by 5.04%. The main reason is that a part of PE is not counted to the project but to the project B (Zhuangsanlian Phase II Associated Gas Recovery and Utilization Project).</p>	
<p>3.2 Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• controlled by the PP</li> <li>• related to the project.</li> <li>• affected by the project</li> <li>• emission reductions of the project.</li> </ul>	<p>The required description including calculation tool, parameters and formulae have been presented in the last version monitoring report with related calculation sheet:</p> <p>The spreadsheet :  "20220830-Zhuangsanlian_UER calculation_2nd.xlsx"</p> <p>has been verified against the corresponding readings records of this monitoring period and found the consistency.</p>	OK
<p>3.3 Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the applied criteria, procedure</p>	<p>The raw data records and laboratory test reports of electronic system have been checked on-site by the lead auditor and found complete.</p> <p>The records titled</p> <ul style="list-style-type: none"> <li>➤ Summary table of production operation in 2021</li> </ul>	OK

Requirement	Verified situation	Concl.
and/or methodology, conduct an assessment of the potential impacts of these changes.	<ul style="list-style-type: none"> <li>➤ Receipts for AG recovery issued by oilfield from 01/01/2021 to 31/12/2021.</li> <li>➤ Receipts for electricity consumption issued by oilfield from 01/01/2021 to 31/12/2021</li> <li>➤ Operation Log covering this monitoring period</li> </ul> <p>have been verified and found consistent.</p>	
3.4 Has information provided for quantifying GHG emissions reductions been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis?	All data inputs to UER calculations have been cross checked with the data records and found appropriate.	OK
3.5 Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	As per the validated PDD ver. 3 dated 11/09/2020.	OK





# Annex 2 Verification Finding List



A silhouette of a person standing in a landscape with a sunset or sunrise sky and green hills.

**Non-Conformities**

None



## Clarifications

<b>Finding CL #01</b>	MR version 01 Section 2.1 Description of the implemented GHG project	
<b>Clarification request</b>	Taking into account, the dry gas for onsite consumption measured at the point D is deducted by the dry gas fed into the project B for CNG production and the total dry gas for CNG production of the project B from 20/02/2021 forward is to be counted to Project B for avoiding double counting, the monitoring system is necessary to cover the project B to make it more complete and clear.	
<b>Clarification Response</b>	The monitoring system of the project B has been added in the Figure 2-1 of section 2.1 in the updated MR (Version 1.1).	
<b>Assessment Method for clarification</b>	<input type="checkbox"/> Inspection <input type="checkbox"/> Interview <input checked="" type="checkbox"/> Check of docs <input type="checkbox"/> Sample	<input checked="" type="checkbox"/> calculation <input type="checkbox"/> Comparison <input type="checkbox"/> Other
<b>Final Conclusion</b>	<p>The updated Figure 2-1 covering the monitoring system for both the Project and the Project B ( phase I and phase II) has been checked and found complete to illustrate the whole picture of the project.</p> <p>According to the whole monitoring system, Project emissions resulted from the on-site dry gas consumption by both the project and project B, can be counted to the project B based on the monitored volume by flowmeters at point D, point J and point I.</p> <p>Hence the CL is closed.</p>	
<b>Assessment</b>	<input type="checkbox"/> material non-conformity <input checked="" type="checkbox"/> non-material non-conformity	<input type="checkbox"/> Forward Action Request <input checked="" type="checkbox"/> issue closed



<b>Finding CL #02</b>	MR version 01 Section 2.1 Description of the implemented GHG project	
<b>Clarification request</b>	<p>Based on <b>CL#01</b>, the description of monitoring the volume of the dry gas fed into the project B for CNG production, e.g. the corresponding flowmeter and calculation formula etc. was not specified in the Monitoring Report version 1.1.</p> <p>Please clarify the necessary information for monitoring the dry gas fed into the project B.</p>	
<b>Clarification Response</b>	The corresponding flowmeters and calculation formula for the volume of the dry gas combusted by two projects have been added in section 3.3 monitoring plan of the updated MR (Version 1.1).	
<b>Assessment Method for clarification</b>	<input type="checkbox"/> Inspection <input type="checkbox"/> Interview <input checked="" type="checkbox"/> Check of docs <input type="checkbox"/> Sample	<input checked="" type="checkbox"/> calculation <input type="checkbox"/> Comparison <input type="checkbox"/> Other
<b>Final Conclusion</b>	<p>As the description added in section 3.3 para. "Monitoring equipment and procedures", from 20/02/2021 onwards, the parameter <b>FC<sub>dry gas,y</sub></b> of the project B shall be the difference between the total volume of dry gas from the two projects (point D and point J) and the volume of CNG production (point I). Before 20/02/2021, the dry gas on-site consumed by the project was still monitored at the point D. Hence the CL is closed.</p>	
<b>Assessment</b>	<input type="checkbox"/> material non-conformity <input checked="" type="checkbox"/> non-material non-conformity	<input type="checkbox"/> Forward Action Request <input checked="" type="checkbox"/> issue closed

<b>Finding CL #03</b>	MR version 01
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	Calibration of flowmeter	
Clarification request	<p>As described in the calibration reports, the accuracy class of flowmeters is 1.5.</p> <p>Based on the Flowmeter introduction manuals, please clarify if the accuracy was integrated parameters P/T and the values displayed was corrected values for the standard condition.</p>	
Clarification Response	<p>As per the specification and instruction manuals, the flow meters have built-in pressure (P), temperature (T) and volume flow (V) sensors (RS485 protocol), which integrate pressure and temperature detection and compensation calculation, so they can directly measure volume flow and accumulated flow under standard conditions. The same has been added in section 3.3 of the updated MR (Version 1.1).</p>	
Assessment Method for clarification	<input type="checkbox"/> Inspection <input type="checkbox"/> Interview <input checked="" type="checkbox"/> Check of docs <input type="checkbox"/> Sample	<input checked="" type="checkbox"/> calculation <input type="checkbox"/> Comparison <input type="checkbox"/> Other
Final Conclusion	<p>The instruction manuals of the flowmeters have been checked and found the proper functions of automatic compensation based on the sensors built-in. It can be confirmed that the readings of the flowmeters were the volume under standard condition.</p> <p>Hence the CL is closed.</p>	
Assessment	<input type="checkbox"/> material non-conformity <input checked="" type="checkbox"/> non-material non-conformity	<input type="checkbox"/> Forward Action Request <input checked="" type="checkbox"/> issue closed

## Annex 3 List of Reviewed Evidence

Reviewed Evidence	
<b>General background information</b>	<ul style="list-style-type: none"> <li>/1/ COUNCIL DIRECTIVE (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels</li> <li>/2/ DIN EN ISO 14064-2:2012; Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements</li> <li>/3/ COMMISSION REGULATION (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council</li> <li>/4/ COMMISSION REGULATION (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council</li> <li>/5/ Austrian Kraftstoffverordnung(KVO) dated 24 June 2020</li> </ul>
<b>Project-specific background</b>	<ul style="list-style-type: none"> <li>/6/ Approved baseline methodology AM0009: “Recovery and utilization of gas from oil fields that would otherwise be flared or vented” Version 07.0</li> <li>/7/ UNFCCC CDM methodological tool 03: Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion – Version 03.0</li> <li>/8/ UNFCCC CDM methodological tool 05: Tool to calculate baseline, project and/or leakage emissions from electricity consumption – Version 03.0</li> <li>/9/ UNFCCC CDM methodological tool 07: Tool to calculate the emission factor for an electricity system” (Version 07.0)</li> </ul>
<b>Project-specific documents</b>	<ul style="list-style-type: none"> <li>/10/ Project Monitoring Report MP2 version 1.1 dated 29/09/2022</li> <li>/11/ Project Monitoring Report MP2 version 01 dated 30/08/2022</li> <li>/12/ Project Design Document version 3 dated 11/09/2020</li> <li>/13/ Validation report no.VS3291941 dated 14/09/2020</li> <li>/14/ 01- Zhuangsanlian_Project Approval dated 16/07/2018</li> <li>/15/ 02- Zhuangsanlian_starting date of construction</li> <li>/16/ 03- Zhuangsanlian_starting date of operation</li> <li>/17/ 04- Layout of project site</li> <li>/18/ 05- Zhuangsanlian_Operation records</li> <li>/19/ 11- Zhuangsanlian_Accreditation of Chemical testing body</li> <li>/20/ 14-Zhuangsanlian_electricity transaction receipt (ETN) of 2021</li> </ul>



## Reviewed Evidence

**Calibration records:**

- /21/ 09-Zhuangsanlian\_Calibration report of flow meters
- /22/ 10-Zhuangsanlian\_Accreditation of flow-meter calibration body
- /23/ 13-Zhuangsanlian\_Calibration report of electricity meter
- /24/ 15-Zhuangsanlian\_Accreditation of electrical meter calibration body

**Sampling reports:**

- /25/ 06-Zhuangsanlian\_Chemical analysis of recovered gas
- /26/ 07-Zhuangsanlian\_Chemical analysis of dry gas

**Calculation sheets and raw data:**

- /27/ 20220830-Zhuangsanlian\_UER calculation\_2nd.xlsx

**Photos (on-site on 05/09/2022)**



# **Annex 4**

## **List of Interviewed Persons**






**Teilnehmerliste / Participant List:**

**Allgemein / General**

Auftragsnummer / Order No.	UER-049
Firma / Company	Sinopec Xinxing Shaanxi Xinyuan Technology Co. Ltd.(owner)
Project:	VERIFICATION for 2 <sup>nd</sup> Monitoring period "Zhuangsanlian Associated Gas Recovery and Utilization Project"
Datum des Audits / Date of Audit	5.Sep.2022 onsite

Name / Name	Funktion / Function	Unterschrift / Signature
Robin Wang	Verico, LA	
Sven Starckx	Verico, A	
Juchuan Bai	Verico, A	
Jianwei Cui	中国石化集团新星陕西新源科技	崔建伟
Haiyan Wang	中国石化集团新星陕西新源科技	王海彦
Yumei Peng	环保科	彭玉美

UER-049-0012-001-01



# **Annex 5**

## **Appointment Certificates**







# Ernennungsurkunde Certificate of Appointment

**Robin Wang**

erfüllt die Voraussetzungen der Prüfstelle der verico sce und wird ernannt zum  
fulfills the requirements according to the guidelines of the verification body of verico sce and is  
appointed as

**Auditor / Lead Auditor**

**für Verifizierungen nach ISO 14064-3**

für die folgenden Scopes/Sektoren  
for the following scopes/sectors

**ISO14064-1: 1, 2, 16**

**ISO14064-2: 1, 3, 8, 10 (CDM Sektoren)**

Die Anforderungen des QM-Handbuches der Prüfstelle von verico SCE sind bindend.

The requirements of the QM-Manual of the verification body of verico SCE are binding.

Diese Ernennung gilt 5 Jahre.

This appointment is valid for 5 years.

Zertifikat Nr. 14064 A29 | ISO14064-3

Langenbach, 28.11.2020

Javier Vallejo Drehs

ver-A110e-2013-05-24

Annex B4 - Ernennungsurkunde Robin Wang ISO14064\_1.docx Seite 1/1

ZERTIFIKAT CERTIFICATE





## Ernennungsurkunde

### Certificate of Appointment

**Sven Starckx**

erfüllt die Voraussetzungen der Prüfstelle der **verico SCE** und wird ernannt zum  
fulfills the requirements according to the guidelines of the verification body of **verico SCE** and is  
appointed as

### Lead Auditor / Technical Reviewer

für die folgenden Scopes  
for the following scopes

**ISO14064-2: 1, 3, 4, 5, 8, 9, 10, 13**

Die Anforderungen des QM-Handbuches der Prüfstelle von **verico SCE** sind bindend.

The requirements of the QM-Manual of the verification body of **verico SCE** are binding.

Diese Ernennung gilt bis 24.06.2025

This appointment is valid until 24.06.2025

Zertifikat Nr. 14064 A07

Langenbach, 25.06.2020

UNTERSCHRIFT

ZERTIFIKAT CERTIFICATE





# Ernennungsurkunde

## Certificate of Appointment

**Martin Beckmann**

erfüllt die Voraussetzungen der Prüfstelle der verico SCE und wird ernannt zum  
fulfils the requirements according to the guidelines of the verification body of verico SCE and is  
appointed as

**Kinder  
Erzieher**

**Auditor / Lead Auditor / Technischer Rezensent**

**für Verifizierungen nach ISO 14064-3**

für die folgenden Scopes/Sektoren  
for the following scopes/sectors

**ISO14064-1: 1, 2, 4, 6, 7, 8, 12; 14, 17, 20 (AVR/EA Scopes)**

**ISO14064-2: 1, 4, 5, 8, 9, 10 (CDM Sektoren)**

Die Anforderungen des QM-Handbuches der Prüfstelle von verico SCE sind bindend.

The requirements of the QM-Manual of the verification body of verico SCE are binding.

Diese Ernennung gilt 5 Jahre.

This appointment is valid for 5 years.

Zertifikat Nr. 14064 A1 ISO14064-3

Langenbach, 09.7.2018

*Javier Vallejo Drehs*  
**Javier Vallejo Drehs**

ZERTIFIKAT CERTIFICATE

ver-A10a-2013-06-24

Annex B4 - Ernennungsurkunde Beckmann ISO14064\_3 MB 2018.docx Seite 1/1









# VE-UER-049-II-MP2 FVR

Final Audit Report


2022-10-28

Created:	2022-10-28
By:	Werner Betzenbichler (werner.betzenbichler@verico.eu)
Status:	Signed
Transaction ID:	CBJCHBCAABAA09gtjOoDL6iepEOo-_09Jt2_uEI5QoDn

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