



VCS VERIFICATION REPORT

NINGXIA XIANGSHAN WIND FARM  
PROJECT


(VCS PROJECT ID: 1867)



Document Prepared By

Shenzhen CTI International Certification Co., Ltd

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<b>Prepared By</b>	Shenzhen CTI International Certification Co., Ltd	
<b>Contact</b>	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: <a href="http://www.cti-cert.org">http://www.cti-cert.org</a>	
<b>Approved By</b>	Zhou Lu	
<b>Work Carried Out By</b>	Team Leader: Tong Dezheng Technical Reviewer: Lin Shunrong	

### Summary:

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions reported for the project activity “Ningxia Xiangshan Wind Farm Project” (VCS Project ID: 1867) for the monitoring period 01/10/2021 to 31/08/2022, 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 Verified Carbon Standard (VCS) version 4.

The verification was performed on the basis of VCS Program Guide version 4.2 and 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 1 CAR, no CL or FAR in this monitoring period.

In CTI’s opinion, the GHG emission reductions reported for the project in the monitoring report (version 02 dated 18/11/2022) are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved methodology ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” (Version 19.0) and the monitoring plan contained in the registered Joint PD & MR version 2.0 dated 07/04/2019.

CTI does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and

certified. Request for issuance of VCUs 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 “Ningxia Xiangshan Wind Farm Project” during the period amount to 707,545 tCO<sub>2</sub>e.

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# 1 INTRODUCTION

Beijing Ruifang Information Technology Co., Ltd has commissioned Shenzhen CTI International Certification Co., Ltd (CTI) to carry out the verification and certification of emission reductions reported for the “Ningxia Xiangshan Wind Farm Project” (the project) for the period 01/10/2021 to 31/08/2022. 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 “Ningxia Xiangshan Wind Farm Project” for the period 01/10/2021 to 31/08/2022.

## 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) /19/;
- VCS Standard (version 4.3) //18/ and other relevant requirements defined by Verra;
- The approved methodology ACM0002 (Version 19.0) /24/ 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. CTI applied a materiality threshold of 1% (for large projects with ER larger than 300,000 tCO<sub>2</sub>e per year) with respect to emission or misstatements concerning reported quantities as per VCS standard (i.e. para 3.9.1 and 4.1.8 (4) of VCS Standard, version 4.3).

### 1.4 Summary Description of the Project

#### Sectoral Scope and Project Type

According to the VCS Program Guide (version 4.2) /19/, the project is applicable under the following activity categories:

- Sectoral Scope: 1. Energy (Renewable/non-renewable).

According to Annex A of the Kyoto Protocol, the project is applicable under the Sectoral Scope 1: Energy Industries (renewable/ non-renewable sources).

#### Project Background

Project title:	Ningxia Xiangshan Wind Farm Project
Project proponent:	Ningxia Zhongwei Aluminum New Energy Co., Ltd (China)
Project location:	Zhongwei City, Ningxia Hui Autonomous Region, People's Republic of China
VCS Project ID:	1867
Applied methodology:	ACM0002 (Version 19.0)
VCS project crediting period:	15/04/2017 to 14/04/2027
VCU verification period:	01/10/2021 to 31/08/2022

## 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 Joint PD & MR, 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	Dezheng TONG	1,8	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> RP <input type="checkbox"/> TR
Technical Reviewer	Shunrong LIN	1,14,15	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RP <input checked="" type="checkbox"/> TR

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

In addition to the VER/VCU monitoring report /1/, Joint PD & MR version 2.0 dated 07/04/2019 /10/, emission reduction calculation spreadsheet /2/, the following documents also were assessed as a part of the verification audit:

- Joint Validation & Verification Report /14/;
- Verification Report of previous monitoring period /9/;
- Baseline and monitoring methodology ACM0002 applied by the project /24/;
- Relevant decisions, clarifications and guidance from the VERRA /18/-/23/; and

- Other information and references relevant to the project activity.

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

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 17/11/2022, CTI visited Ningxia Zhongwei Aluminum New Energy Co., Ltd. performed on-site assessment. The key personnel of the project were interviewed or assisted the verification team. 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 are summarized in the table below:

Interviewed personnel	Role	Organization	Subject
Mr. Zhang Hongbo	Manager	Ningxia Zhongwei Aluminum New Energy Co., Ltd	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement;
Mr. Wang Chao	Maintenance Staff	Ningxia Zhongwei Aluminum New Energy Co., Ltd	Calibration of meters and equipment maintenance; Data collection and ER calculation.
Ms. Chen Chen	Staff	Local Environmental Protection Bureau	Environmental impact of the project activity.
Mr. Ma Jun	Villager	Haojiadigou Village	
Ms. Wang Li	Villager	Shahao Village	
Mr. Zhou Ming	Villager	Dadigou Village	
Ms. Hu Pingping	Villager	Midigou Village	

Ms. Li Wen	Villager	Tuba Village	
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## 2.4 Site Inspections

The verification team performed the on-site verification (southwest of Zhongwei City, Ningxia Hui Autonomous Region, People’s Republic of China) on 17/11/2022. The interviewed personnel and objective are listed in above table. 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 VCS PD for the project activity;
- A review of information flows for generating, 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 in the VCS PD;
- A cross-check between information provided in the monitoring report and data from other sources such as plant logbooks and electricity sale receipts;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the 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.

The data presented in the monitoring report were assessed by review of the detailed project documentation and production records, as well as by interviews with personnel from the project developer Ningxia Zhongwei Aluminum New Energy Co., Ltd. and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results, to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition all parameters required by the monitoring methodology ACM0002 (Version 19.0), 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 1 CAR and no CL in this monitoring period.

#### 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 /14/, and no FAR was raised during this verification.

## 2.6 Eligibility for Validation Activities

The project was validated by LGAI Technological Center S.A. (Applus+ Certification) on 08/04/2019 against Voluntary Carbon Standard version 3 during the joint validation and first periodic verification /14/. The proposed monitoring period 01/10/2021 to 31/08/2022 is 5th verification, and CTI just undertook verification activities for the project according to the VCS Program Guide (version 4.2). This section is thus not applicable.

Furthermore, CTI conducted verification less than six consecutive years and thereby is in compliance with para 4.1.20 of VCS standard version 4.3, which stated that “A validation/verification body may not verify more than six consecutive years of a project’s GHG emission reductions or removals.”.

# 3 VALIDATION FINDINGS

## 3.1 Participation under Other GHG Programs

The project was validated by LGAI Technological Center S.A. (Applus+ Certification) on 08/04/2019 against VCS Standard version 3.7 during the joint validation and first periodic verification/14/, and CTI only performed verification activities on the proposed monitoring period for the project according to the VCS Program Guide.

### 3.2 Methodology Deviations

The validation process /14/ has assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable CDM methodology ACM0002 (Version 19.0) /24/. There was not any methodology deviation applied to this project. Details refer to section 4.1.

### 3.3 Project Description Deviations

There were not project description deviations identified by CTI to this monitoring period. The verification team assessed through visual inspection and document review that all physical features of the proposed project activity including data monitoring, reporting and collecting systems have been implemented in accordance with the monitoring plan included in registered Joint PD & MR (version 2.0 dated 07/04/2019) /10/. Details refer to section 4.1.

### 3.4 Grouped Project

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

## 4 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Ningxia Xiangshan Wind Farm Project” for the period 01/10/2021 to 31/08/2022.

### 4.1 Project Implementation Status

#### **Project Implementation in accordance with the registered project design document**

The project is a wind power plant and locates at southwest of Zhongwei City, Ningxia Hui Autonomous Region, People’s Republic of China. The project installed 265 wind turbines, each with a capacity of 1.5 MW. The total installed capacity of the project activity is 397.5 MW. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each wind turbine and monitoring equipment. The details of the wind turbines with respect to installation and capacity have been verified to be consistent with description indicated in the registered Joint PD & MR. The project started construction on 01/11/2016, and starts commercial operation on 15/04/2017 and full operation on 20/07/2017 /14/. The electricity generated by the project activity was supplied to the Northwest Power Grid (NWPGR), which can be confirmed by the Power Purchase Agreement (PPA) signed between Ningxia Zhongwei Aluminum New Energy Co., Ltd. and State Grid Ningxia Electric Power Co., Ltd. /3/.

The project start date was identified as 15/04/2017 when the project started to operate and began generating GHG emission reductions. According to VCS Standard 3.0, the project crediting period under

VCS Version 03 shall be deemed as 10 years and commences at the specific project crediting period start date. The project was validated by LGAI Technological Center S.A. (Applus+ Certification) on 08/04/2019 against VCS Standard version 3.7 and the starting date of the crediting period was chosen by the project proponent as 15/04/2017. Hence, the crediting period of the project is from 15/04/2017 to 14/04/2027. The same has been justified in the Joint Validation & Verification Report /14/ and verification report of previous monitoring period /9/. The selected monitoring period 01/10/2021 to 31/08/2022 is the 5<sup>th</sup> monitoring period of the project, which is within the crediting period 15/04/2017 to 14/04/2027.

The technical parameters of wind turbine have been verified with the nameplates /15/ as below:

Rated capacity	1,500kW
Impeller diameter	82~89m
Wheel hub height	70m
Cut-in wind speed	3.0m/s
Rated wind speed	10.5m/s
Cut-out wind speed	25m/s
Max design wind speed	52.5m/s
Rated voltage	690kV
Manufacturer	Dongfang Electric Corporation Dongfang Turbine Co., Ltd

Via onsite investigation and checking daily operation and maintenance records /6/, the verification team confirmed that:

- there is no proposed or actual change during this monitoring period to the registered Joint PD & MR (version 2.0 dated 07/04/2019);
- all required equipments and procedures are available and implemented in an appropriate manner;
- the project is completely operational and all necessary monitoring instruments are installed;
- all required instruments including standby and operating procedures for the same have been implemented in an appropriate manner;
- neither mistakes nor malfunction on main meters have been observed during this monitoring period.
- the control system at the power plant is automated and assures continuous operation, including monitoring on malfunction of equipment;
- no serious malfunction happened and the plant was under a normal operation as expected in this monitoring period.

Furthermore, on-site training for the related procedures including monitoring, recording and reporting was verified to be in place /5/ and their implementation was confirmed by interview with the key operators and observing the operation. The monitoring structure and responsibility of personnel, as well as internal auditing process have been verified during site visit and confirmed to be in compliance with the the monitoring plan contained in the registered Joint PD & MR (version 2.0 dated 07/04/2019).

In conclusion, as part of the site visit, CTI confirms that:

- the monitoring plan contained in the registered Joint PD & MR (version 2.0 dated 07/04/2019) is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (Version 19.0);
- the project implementation is in accordance with the registered Joint PD & MR (version 2.0 dated 07/04/2019);
- all the monitoring system in operation period is in accordance with the registered Joint PD & MR (version 2.0 dated 07/04/2019);
- all physical features of the proposed project activity including data collection systems and storage systems have been implemented in accordance with the registered Joint PD & MR (version 2.0 dated 07/04/2019) through visual inspection and document review.

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

CTI checked public information from the UNFCCC website, REC Mechanism database of China, I-REC database, Chinese Emission Trading System, Gold Standard Registry and interviewed with project owner during site visit, it is confirmed that except VCS scheme, the project has not been participated or been rejected under any other GHG programs since validation. Therefore, the verification team confirmed that the project only applies VCUs under VCS, and no rejection from VCS occurs, there are no other forms of environmental credits applied or issued for the project activity, the emission reduction resulted from the project during this monitoring period would only apply for VCUs.

**SD contributions resulted by implementation of the project activity**

By checking registered Joint PD & MR, China's National Plan on Implementation of the 2030 Agenda for Sustainable Development and 17 SDGs defined by UNDP, and interviewing with stakeholders during site visit, the verification team confirmed that the project would contribute to sustainable development in as below:

- **SDG 13:** Reducing greenhouse gas emissions compared to a business-as-usual scenario. During this monitoring period, the emission reductions achieved were 707,545tCO<sub>2</sub>e. By checking VERRA website, it is confirmed that since operation of the project activity, the cumulative emission reductions achieved were 4,229,223tCO<sub>2</sub>e.

- **SDG 7:** Providing clean and renewable energy source and displacing the power generation of fossil fuel power plants, reducing pollution emissions caused by coal burning significantly, thus mitigating the air pollution and its adverse impacts on human health, promoting sustainable economic development in local area. During this monitoring period, the renewable energy supplied to the power grid was 922,010.726MWh. By checking VERRA website, it is confirmed that since operation of the project activity, the cumulative renewable energy supplied to NWPGE was 5,510,658.48MWh.

- **SDG 8:** Providing direct and indirect employment opportunities during construction and operation period, which promotes sustained, inclusive and sustainable economic growth, full and productive employment and decent work for local residents. By checking staff roaster listed in Appendix I of the MR, it is confirmed that since operation of the project activity, 65 long term working opportunities, including 13 females, are provided.

The verification team confirmed that there is no proposed or actual change to monitoring plan of registered Joint PD & MR (version 2.0 dated 07/04/2019) during this monitoring period. All required equipments and procedures are available and implemented in an appropriate manner. All necessary monitoring instruments are installed. All required instruments including standby and operating procedures for the same have been implemented in an appropriate manner. 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

By checking the EIA summary /17/ and conclusion provided in the registered Joint PD & MR, it is confirmed that wind power is green power and the impact caused by wind power on the surrounding ecosystem and residents, wastewater, solid waste and atmosphere etc. is very little, there would be no net harm caused due to the project activity. Also, the EIA of the project /17/ are approved by the government.

Also, no potential environment or social economic matter was found during the site visit. The project is renewable energy project and thus no net harm observed in air or water quality on-site.

### 4.2.2 Local Stakeholder Consultation

The local stakeholder's meeting was held in Xiangshan County in Nov 2016 and Nov 2017. 150 questionnaires were released. In addition, 40 people is interviewed including local residents, builders and members of the local authorities. The project developer introduced the proposed project, and then a survey was arranged through a one-page questionnaire, which was designed to be easily filled in. The opinions expressed by the stakeholders were recorded and are available on request.

The stakeholder meeting and the 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.

By checking grievance books and interview with local stakeholders during on-site visit, the verification team confirmed that on-going communications with Local stakeholders was being carried out by the project owner during this monitoring period and no negative comments received for the project.

All such conclusion has been verified through site visit and check registered Joint PD & MR.

### 4.3 AFOLU-Specific Safeguards

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

### 4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The monitoring has been carried out in accordance with the registered Joint PD & MR (version 2.0 dated 07/04/2019). CTI confirms that all parameters stated in the monitoring plan are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0002 (Version 19.0) and the management system were 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, aggregation, recording, calculation and reporting) for these parameters is provided. The information flow for the each parameter in further verified in the following sections.

#### **Parameters monitored**

According to registered Joint PD & MR (version 2.0 dated 07/04/2019), there is only one monitoring parameter of the project activity:

✓ **Quantity of net electricity generation supplied by the Project to the grid in year y ( $EG_{\text{facility},y}$ )**

Electricity generated by this project is transmitted to 110kV on-site substation by 35kV transmission lines and then sent to the Ningxia power grid, which is part of the Northwest Power Grid (NWPG). Finally the electricity is supplied to the Northeast Power Grid (NWPG) of China.

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ( $EG_{\text{facility},y}$ ) is calculated by following formula:

$$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y}$$

$EG_{\text{export},y}$  is electricity exported to the grid by the project;

$EG_{\text{import},y}$  is electricity imported to the project activity by the grid.

For  $EG_{\text{export},y}$  and  $EG_{\text{import},y}$  are sourced from Meter Reading Records (MRRs) /7/ issued by the project developer, and Electricity Transaction Notes (ETNs) /8/ issued by power grid company covering monitoring period.

- $EG_{\text{export},y}$

4 bidirectional electricity meters (2 main meters and 2 backup meters) installed on the transform substation was measured continuously, recorded monthly and archived electronically. At 24:00 hr of last day of each month, the staff from project developer and power grid company will record electricity meter's readings and form Monthly Reading Records (MRRs) /7/. The staff from power grid company will then transcribes the data into Electricity Transaction Notes (ETNs) /8/.

- **EG<sub>import,y</sub>**

4 bidirectional electricity meters (2 main meters and 2 backup meters) installed on the transform substation was measured continuously, recorded monthly and archived electronically. At 24:00 hr of last day of each month, the staff from project developer and power grid company will record electricity meter's readings and form Monthly Reading Records (MRRs) /7/. The staff from power grid company will then transcribes the data into Electricity Transaction Notes (ETNs) /8/.

As described above, the meters have been installed in accordance with the MP of Joint PD & MR. CTI has on-site checked the location of the meters against the diagram of power connection system and found them to be consistent.

Data in the monthly reading records were used to the report, through a cross check with ETNs, and the conservative values from electricity export and import were applied to calculate the net electricity supplied to the grid by the project. The data reported in the monitoring report and ERs calculation spreadsheet has been verified by the verification team. Supporting references and data required to determine the net electricity supplied to the grid by the project is found to be complete and transparent.

### **Monitoring equipment and calibration**

The meters have been calibrated periodically as per the relevant industrial standard by the qualified third party to ensure the monitoring equipments' accuracy and in good conditions. The relevant information of meters' calibration is listed as below.

Meter	Serial Number	Type	Accuracy Class	Calibration Frequency	Calibration Date	Validity	Calibration Entity
M522 (main meter)	080002009870	DSSD8848	0.2s	Annually	19/03/2021	18/03/2022	Measurement Center of State Grid Ningxia Electric Power Co., Ltd /11//12/
					09/03/2022	08/03/2023	
M523 (backup meter)	080002009875	DSSD8848	0.2s	Annually	19/03/2021	18/03/2022	
					09/03/2022	08/03/2023	
M533 (main meter)	080002009822	DSSD8848	0.2s	Annually	19/03/2021	18/03/2022	
					09/03/2022	08/03/2023	
M534 (backup meter)	080002009872	DSSD8848	0.2s	Annually	19/03/2021	18/03/2022	
					09/03/2022	08/03/2023	

Calibration records and accreditation certificates /12/ have been verified by the verification team. In the registered Joint PD & MR, the accuracy of meters are 0.2s. By checking the industrial metering configuration standard “Technical Administrative Code of Electric Energy Metering (DL/T 448-2020)” /13/, CTI can confirm that the accuracy level of all meters meet the requirement stipulated in this standard. CTI can thus confirm that the accuracy of the meters is in line with the monitoring plan of the registered Joint PD & MR and relevant industry standard.

In the registered Joint PD & MR, it stated that the meters will be calibrated and checked periodically for accuracy. By checking the calibration reports, CTI found the calibration frequency of these meters is annual, which is in line with the calibrating standard “Technical Administrative Code of Electric Energy Metering (DL/T 448-2016)” /13/. Hence, CTI can confirm that the meters’ calibration frequency is in line with the monitoring plan of the registered Joint PD & MR and relevant industry standard, and the calibrations of meters are verified to be valid for the whole reporting period.

### **Data management and control**

Ningxia Zhongwei Aluminum New Energy 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 VER project management and monitoring manual /4/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff and check records /4/-/6/ 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.

### **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:

$$ER_y = BE_y - PE_y$$

#### **✓ Baseline emissions**

The baseline reductions are determined as multiplying Quantity of net electricity generation supplied by the Project to the grid ( $EG_{\text{facility},y}$ ) by the validated ex-ante fixed grid emission factor ( $EF_{\text{grid,CM},y}$ ):

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid,CM},y}$$

- **Grid emission factor ( $EF_{grid,CM,y}$ )**

EF is the grid emission factor of the which has been verified ex-ante in the validation stage in registered Joint PD & MR (version 2.0 dated 07/04/2019) as 0.7674 tCO<sub>2</sub>e/MWh.

- **Quantity of net electricity generation supplied by the Project to the grid in year y ( $EG_{facility,y}$ )**

$EG_{facility,y}$  is the quantity of net electricity generation supplied by the project plant/unit to the grid in year y, which is calculated by following formula:

$$EG_{facility,y} = EG_{export,y} - EG_{import,y}$$

$EG_{export,y}$  is electricity exported to the grid by the project which is determined by readings of main meter 522 and 533.  $EG_{import,y}$  is electricity imported to the project activity by the grid which is determined by the readings of main meter 522 and 533. Data in the ETNs were used to cross-checked with that in the Monthly Reading Records (MRRs). The most conservative values have been applied to calculate the electricity exported to and imported from the grid by the project.

$EG_{export,y}$  (MWh):

Period	$EG_{export,y}$				
	A (main meter 522)	B (main meter 533)	C = A+B	D (ETNs)	MIN (C,D)
01/10/2021-31/10/2021	37,870.056	40,218.430	78088.486	78,088.486	78,088.486
01/11/2021-30/11/2021	42,070.518	40,539.996	82610.514	82,610.514	82,610.514
01/12/2021-31/12/2021	41,947.458	42,608.328	84555.786	84,555.786	84,555.786
01/01/2022-31/01/2022	38,898.538	40,943.364	79841.902	79,841.902	79,841.902
01/02/2022-28/02/2022	45,676.512	44,744.770	90421.282	90,421.282	90,421.282
01/03/2022-31/03/2022	47,304.306	46,501.574	93805.880	93,805.880	93,805.880
01/04/2022-30/04/2022	41,883.156	45,652.614	87535.770	87,535.770	87,535.770
01/05/2022-31/05/2022	42,583.282	45,127.544	87710.826	87,710.826	87,710.826
01/06/2022-30/06/2022	38,197.054	42,819.798	81016.852	81,016.852	81,016.852
01/07/2022-31/07/2022	42,035.252	40,012.938	82048.190	82,048.190	82,048.190
01/08/2022-31/08/2022	40,509.168	37,988.202	78497.370	78,497.370	78,497.370
<b>Total</b>	<b>458,975.300</b>	<b>467,157.558</b>	<b>926,132.858</b>	<b>926,132.858</b>	<b>926,132.858</b>

$EG_{import,y}$  (MWh):

Period	$EG_{import,y}$
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	A (main meter 522)	B (main meter 533)	C=A+B	D (ETNs)	MAX (C,D)
01/10/2021-31/10/2021	151.564	221.620	373.184	373.184	373.184
01/11/2021-30/11/2021	184.268	230.594	414.862	414.862	414.862
01/12/2021-31/12/2021	188.846	197.694	386.540	386.540	386.540
01/01/2022-31/01/2022	168.700	223.776	392.476	392.476	392.476
01/02/2022-28/02/2022	183.946	139.636	323.582	323.582	323.582
01/03/2022-31/03/2022	146.132	198.464	344.596	344.596	344.596
01/04/2022-30/04/2022	193.550	215.460	409.010	409.010	409.010
01/05/2022-31/05/2022	189.868	227.962	417.830	417.830	417.830
01/06/2022-30/06/2022	142.002	175.196	317.198	317.198	317.198
01/07/2022-31/07/2022	214.564	217.154	431.718	431.718	431.718
01/08/2022-31/08/2022	150.346	160.790	311.136	311.136	311.136
<b>Total</b>	<b>1,913.786</b>	<b>2,208.346</b>	<b>4,122.132</b>	<b>4,122.132</b>	<b>4,122.132</b>

Hence, the quantity of the net electricity supplied to the grid from the project EG during the monitoring period was calculated conservatively as:

$$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y} = 926,132.858 - 4,122.132 = 922,010.726 \text{ MWh}$$

And the corresponding baseline emission reductions are calculated as:

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid,CM},y} = 922,010.726 \times 0.7674 = 707,545 \text{ tCO}_2\text{e}$$

✓ **Project emissions**

As stated in the registered PD & MR, for the wind power activities, the project emissions from the project are not considered. Hence,  $PE_y$  during the monitoring period from Ningxia Xiangshan Wind Farm Project is considered as zero.

✓ **Leakages**

Leakage does not need to be accounted for this project as per the registered PD & MR.

✓ **Emission reductions**

The emission reductions for this monitoring period was calculated as:

Monitoring period	GHG emission reductions or removals (tCO <sub>2</sub> e)
01/10/2021- 31/12/2021	187,305

01/01/2022-31/08/2022	520,240
<b>Total ERs claimed (in 335 days)</b>	<b>707,545</b>

**Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in validated VCS document**

The emission reductions claimed are 707,545 tCO<sub>2</sub>e in this monitoring period (i.e. 335 days). Compared with yearly expected emission reductions 668,148 tCO<sub>2</sub>e (calculated as 727,982 tCO<sub>2</sub>e/365 days\*335 days) in the registered joint PD & MR, the reported emission reductions in this monitoring period are 5.9% higher than the expected, which is considered to be in the reasonable variation range. Moreover, when considering actual annual electricity generation in this monitoring period in the financial analysis, the IRR of the project is still under the benchmark /10/ /14/. CTI is able to confirm that the actual power supply and also emission reductions reported in this monitoring period are reasonable and appropriate. CTI verified the input data for calculating emission reductions and the calculating process, and confirmed the result were complete and transparent.

#### 4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

All necessary documentations are collected, referenced and aggregated, which is easily accessible in hard-copy or electronic format. Measurements are performed by calibrated equipment, and the key data can also be cross-checked via other sources, such as records, receipts and inventory data. No assumptions are used that have any material influence on reported emission reductions.

CTI concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

#### 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 “Ningxia Xiangshan Wind Farm Project” in China (VCS Project ID: 1867) for the period 01/10/2021 to 31/08/2022.

The verification is based on the baseline and monitoring methodology ACM0002 (Version 19.0), the registered PD & MR (version 2.0 dated 07/04/2019) and the monitoring report (version 02 dated 18/11/2022). 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 approach was based on the requirements as defined under the applicable VCS Version 4 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 joint PD & MR;
- the monitoring plan in registered joint PD & MR is as per the applied methodology;
- the monitoring complies with the monitoring plan in the registered joint PD & MR;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS Version 4 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.

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.

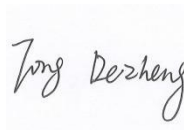
In CTI's opinion the GHG emissions reductions of the "Ningxia Xiangshan Wind Farm Project" for the period 01/10/2021 to 31/08/2022 are fairly stated in the monitoring report (version 02 dated 18/11/2022). The GHG emission reductions were calculated correctly on the basis of the approved methodology ACM0002 (Version 19.0) and the monitoring plan contained in the registered PD & MR (version 2.0 dated 07/04/2019).

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:

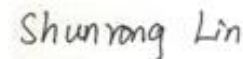
Verification period: From 01/10/2021 to 31/08/2022

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

Year	Baseline emissions or removals (tCO <sub>2</sub> e)	Project emissions or removals (tCO <sub>2</sub> e)	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
01/10/2021- 31/12/2021	187,305	0	0	187,305
01/01/2022-31/08/2022	520,240	0	0	520,240
<b>Total</b>	<b>707,545</b>	<b>0</b>	<b>0</b>	<b>707,545</b>



Mr. Tong Dezheng  
Team Leader  
21/11/2022



Ms. Lin Shunrong  
Technical Reviewer  
21/11/2022

# APPENDIX A: ABBREVIATIONS

CAR	Corrective Action Request
CER	Certified Emission Reduction(s)
CL	Clarification request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
CTI	Shenzhen CTI International Certification Co., Ltd
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
MP	MONITORING REPORT
MR	Monitoring Report
NWPG	Northwest Power Grid
PD	Project Description
PP	Project Proponent
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit

## APPENDIX B: REFERENCES

Documentation used to verify the information provided by the project proponents

- /1/ Beijing Cronus Technology Counsultancy Centre: VER/VCU Monitoring Report for Ningxia Xiangshan Wind Farm Project, version 01.1 dated 30/10/2022 and version 02 dated 18/11/2022.
- /2/ Beijing Cronus Technology Counsultancy Centre: Emission reduction calculation spreadsheet for Ningxia Xiangshan Wind Farm Project.
- /3/ Ningxia Zhongwei Aluminum New Energy Co., Ltd and State Grid Ningxia Electric Power Co., Ltd: Power Purchase Agreement for Ningxia Xiangshan Wind Farm Project.
- /4/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: VER monitoring manual and management procedure.
- /5/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: Records of training for on-site staff.
- /6/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: Operation log sheets, from 01/10/2021 to 31/08/2022.
- /7/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: Monthly reading records (MMRs) of electricity imported and exported by Ningxia Xiangshan Wind Farm Project from 01/10/2021 to 31/08/2022.
- /8/ State Grid Ningxia Electric Power Co., Ltd: Monthly electricity transaction notes from 01/10/2021 to 31/08/2022.
- /9/ Shenzhen CTI International Certification Co., Ltd: VCS Verification Report of 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> monitoring period, version 01.0 dated 06/03/2020; version 01.0 dated 06/04/2021; version 01.0 dated 09/10/2021
- /10/ Beijing Cronus Technology Consultancy Centre: Joint Project Description & Monitoring Report, version 2.0 dated 07/04/2019.
- /11/ Ningxia Hui Autonomous Region Quality and Technical Supervision Bureau: Accreditation certificate of Measurement Center of State Grid Ningxia Electric Power Co., Ltd , issued on 28/01/2017, valid till 27/01/2022; issued on 18/01/2022, valid till 17/01/2027
- /12/ Measurement Center of State Grid Ningxia Electric Power Co., Ltd: Calibration certificates for meter 522, 523, 533 and 534 covering this monitoring period.
- /13/ State Economic and Trade Commission: Technical administrative code of electric energy metering (DL/T 448-2016).

- /14/ LGAI Technological Center S.A. (Applus Certification): Joint Validation & Verification Report, version 01.1, dated 08/04/2019.
- /15/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: nameplate of the equipment
- /16/ Ningxia Zhongwei Aluminum New Energy Co., Ltd: HR records  
Environmental Impact Assessment (EIA) Report, completed by Ningxia Dingxing Consulting
- /17/ company and approved by Environmental Protection Bureau of Ningxia Hui Autonomous Region on 05/07/2015

#### Methodologies, tools and other guidance

- /18/ Verified Carbon Standard: VCS Standard, version 4.3.
- /19/ Verified Carbon Standard: VCS Program Guide, version 4.2.
- /20/ Verified Carbon Standard: VCS Sectoral Scopes
- /21/ Verified Carbon Standard: Registration and Issuance Process, version 4.2.
- /22/ Verified Carbon Standard: VCS Verification Report Template, version 4.1.
- /23/ Verified Carbon Standard: VCS Monitoring Report Template, version 4.1.
- /24/ UNFCCC EB: Approved methodology, ACM0002, version 19.0

# APPENDIX C: 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
01	Please supplement the monthly electricity data measured respectively by main meter 522 and 523, and its crosschecking process.	The monthly electricity data by meter 522 and 523, and the crosschecking process are added in the revised MR.	The monthly electricity data measured respectively by main meter 522 and 523, and its crosschecking process have been supplemented in the updated MR. The values have been verified to be correct through checking monthly meter readings and Electricity Transaction Notes. Therefore, CAR 01 was closed.

Table 2: Clarification Requests

CL ID	Clarification Request	Response by Project Proponent	Verification Team Assessment
NA	NA	NA	NA

Table 3: Forward Action Requests

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