

VCS VERIFICATION OF KANGBAO SANXIATIAN WIND FARM PROJECT



Document Prepared By LGAI Technological Center, S.A.

Project Title	Kangbao Sanxiatian Wind Farm Project
Version	01.1
Report ID	A+SH_SYST_10815 Vcs

Report Title	VCS verification of Kangbao Sanxiatian Wind Farm Project
Client	Goldchina Consultancy International Co., Ltd.
Pages	21
Date of Issue	11/04/2016
Prepared By	LGA Technological Center, S.A.
Contact	Address: Ctra. Accés a la facultat de Medicina, s/n Campus UAB, E - 08193 Bellaterra (Barcelona) – Spain Tel.: +34 935 672 008 Website: www.applus.com Email: miquel.sitjes@applus.com
Approved By	Miquel Sitjes Cabanas 
Work Carried Out By	Team Leader/Lead Auditor: Denny Xue

Summary:

LGA Technological Center, S.A. (hereafter referred to as "Applus+ LGAI") has been commissioned by

Goldchina Consultancy International Co., Ltd. to perform the verification of greenhouse gas emission reductions of the project activity “Kangbao Sanxiatian Wind Farm Project” (UNFCCC Ref. No. 3312, VCS Ref. No. 697, hereafter referred to as “the project activity”) reported in the monitoring report /1/ during monitoring period 30/11/2011 to 31/12/2012.

The project activity has been validated by BUREAU VERITAS CERTIFICATION (BV) based on the CDM PDD /3/ version 02 dated 18/12/2009 and reported in the validation report No. BVC/CHINA-VAL/0194/2009 /4/, version 01, completed on 21/01/2010. The project activity was registered as a CDM project activity on 26/11/2010 which is available at <http://cdm.unfccc.int/Projects/DB/BVQI1264129691.43/view>. The project was registered as a VCS project activity later which is available at http://www.vcsprojectdatabase.org/#/project_details/697.

The project activity is a wind farm project located in Kangbao County, Zhangjiakou City, Hebei Province, P. R. of China, which is to use wind resource for electricity generation. The installed capacity of the project activity is 49.5 MW, consisting of 33 sets of wind turbines with unit capacity of 1.5 MW. The average annual power delivered to the grid by the project is expected to be 118,354.5 MWh. The Project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants North China Power Grid (NCPG). It's estimated that the proposed project could achieve GHG emission reductions of 124,846 tCO₂e annually.

The purpose and scope of this verification is to ensure that reported emission reductions are complete and accurate in accordance with applicable VCS standards and relevant UNFCCC requirements in order to be certified. A desk review and a site visit have been conducted to verify the data submitted in the monitoring report /1/. Applus+ LGAI confirms the following has been reviewed:

- Monitoring plan included in the registered CDM PDD /3/, version 02, dated 18/12/2009 and the VCS Project Description /4/;
- Revised Monitoring Plan approved by UNFCCC dated 13/10/2011 /11/;
- Validation report No. BVC/CHINA-VAL/0194/2009 /4/, version 01, completed on 21/01/2010;
- Approved methodology, ACM0002 /7/, version 10.0, dated 11/06/2009;
- VCS standards and guidance, as well as relevant UNFCCC requirements;
- All information and references relevant to the project activity's resulting in emission reductions.

During this verification, no finding was identified related to the monitoring, implementation or operations of the project activity in relation to relevant VCS standards, guidance and UNFCCC requirements and relevant host party criteria and the applied baseline and monitoring methodology etc.

- Applus+ LGAI confirms that the project is implemented in accordance with the registered CDM PDD /3/. The monitoring plan complies with the applied methodology ACM0002 /7/ version 10.0 and the monitoring has been carried out in accordance with the monitoring plan in the registered CDM PDD /3/. The monitoring system is in place and the emission reductions are calculated without material misstatements. The level of assurance of the verification is reasonable. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information reviewed and evaluated Applus+ LGAI confirms that the implementation of the project has resulted in 161,836 tCO₂e emission reductions during period 30/11/2011 to 31/12/2012.

Table of Contents

	Table of Contents.....	3
1	Introduction	5
1.1	Objective	5
1.2	Scope and Criteria	5
1.3	Level of Assurance.....	5
1.4	Summary Description of the Project	5
2	Verification Process	7
2.1	Method and Criteria.....	7
2.2	Document Review	8
2.3	Interviews	8
2.4	Site Inspections.....	9
2.5	Resolution of Findings.....	9
2.5.1	Forward Action Requests.....	9
2.6	Eligibility for Validation Activities	9
3	Validation Findings	10
3.1	Participation under Other GHG Programs	10
3.2	Methodology Deviations.....	10
3.3	Project Description Deviations	10
3.4	Grouped Project	10
4	Verification Findings	11
4.1	Project Implementation Status	11
4.2	Accuracy of GHG Emission Reduction and Removal Calculations	13
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals	18
4.4	Non-Permanence Risk Analysis	18

5	Verification conclusion.....	19
	APPENDIX 1: Reference list.....	21

1 INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A. has been commissioned by Goldchina Consultancy International Co., Ltd. to perform the verification of greenhouse gas emission reductions of the project activity “Kangbao Sanxiatian Wind Farm Project” (UNFCCC Ref. No. 3312, VCS Ref. No. 697) reported in the Monitoring Report /1/ during monitoring period 30/11/2011 to 31/12/2012.

LGAI Technological Center, S.A. as the verification body of the project activity has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

The objective of verification is to have an independent review and ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the pre-registered CDM project activity during the monitoring period from the date when the project started to operate until the date when the project was actually registered as a CDM project activity by the CDM-EB. Certification is the written assurance by the DOE that, during a specific time period, a proposed VCS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The objective of this verification/certification is to verify and certify emission reductions, reported for the “Kangbao Sanxiatian Wind Farm Project” in China for the period 30/11/2011 to 31/12/2012.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the registered CDM PDD and VCS Project Description (VCS-PD), the Project’s baseline study and Monitoring Report (MR) and other relevant documents. The information in these documents is reviewed against VCS Version 3 requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the Project monitoring towards reductions in the GHG emissions.

1.3 Level of Assurance

The verification report is based on the VCS-PD, CDM-PDD, the VCS Monitoring Report (MR), supporting evidences made available to the verifier and information collected through performing interviews and during the on-site assessment.

The verification conclusion is assured a reasonable level of assurance.

1.4 Summary Description of the Project

Project title	Kangbao Sanxiatian Wind Farm Project
UNFCCC reference number	3312
VCS reference number	697

Project Participants	Hebei Construction Investment New Energy Co., Ltd. (Project Owner, host country, P. R. China); Goldchina Consultancy International Co., Ltd. (VER Buyer, P. R. China)
Location of the project	Kangbao County, Zhangjiakou City, Hebei Province, P. R. of China Geographic coordinates: longitude 114°29'47.3"E and latitude 41°53'57.6" N
Project start date	Construction start date: 01/05/2009 Operation start date: 28/11/2009
Date of registration as CDM project	26/11/2010
Version of registered CDM PDD	Version 02, dated 18/12/2009
Monitoring period	30/11/2011 to 31/12/2012
First monitoring report	Version 01, dated 17/02/2016
Final monitoring report	Version 02, dated 10/04/2016
Applied Methodology/Version	ACM0002, version 10.0, dated 11/06/2009
Scope/Technical Area	1/1.2

The project activity is a wind farm project located in Kangbao County, Zhangjiakou City, Hebei Province, P. R. of China, which is to use wind resource for electricity generation. The installed capacity of the project activity is 49.5 MW, consisting of 33 sets of wind turbines with unit capacity of 1.5 MW. The average annual power delivered to the grid by the project is expected to be 118,354.5 MWh. The Project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants North China Power Grid (NCPG). It's estimated that the proposed project could achieve GHG emission reductions of 124,846 tCO₂e annually.

The project activity has been validated by BUREAU VERITAS CERTIFICATION (BV) based on the CDM PDD /3/ version 02 dated 18/12/2009 and reported in the validation report No. BVC/CHINA-VAL/0194/2009 /4/, version 01, completed on 21/01/2010. The project activity was registered as a CDM project activity on 26/11/2010 which is available at <http://cdm.unfccc.int/Projects/DB/BVQ1264129691.43/view>. The project was registered as a VCS project activity later which is available at http://www.vcsprojectdatabase.org/#!/project_details/697.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification was conducted using Applus+ LGAI's procedures in line with the requirements specified in the VCS Standard, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant UNFCCC requirements and applying standard auditing techniques.

Applus+ LGAI completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

Applus+ LGAI verified the implementation of the monitoring plan and the data presented in the Monitoring Report /1/ for the period in question. This involved a site visit and a desk review of the Monitoring Report. This Verification Report describes the findings of this assessment.

The information of the assessment team is included in section 2.1.1 of the report.

Assessment team

According to the sectoral scopes / technical area and experiences in the sectoral or national business environment, Applus+ LGAI has composed a project assessment team in accordance with the appointment rules in Applus+ LGAI. The composition of assessment team has to be approved by the Applus+ LGAI ensuring that the required skills are covered by the team. The four qualification levels for team members that are assigned by formal appointment rules as below:

- Leader Auditor (LA)
- Auditor (A)
- Auditor Trainee (T)
- Technical Experts (E)

Name	Qualification	Coverage of scope	Coverage of Technical Area	Host country experience
<i>Hanshen (Denny) Xue</i>	LA	Y (1.2)	Y	Y

Technical Reviewer:

- Meng (Simon) Shen

Hanshen (Denny) Xue (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is a lead auditor appointed by Applus+ LGAI for the GHG project assessment. He is based on Shanghai. He has 1.5 years of work experiences in CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development.

Meng (Simon) Shen (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Verifier and ISO 9001/14001 Lead Auditor for 3.5 years.

2.2 Document Review

The VCS monitoring report /1/ version 01 dated 17/02/2016, version 02 dated 10/04/2016 and the emission reduction calculations spreadsheet /2/, were assessed as part of the verification. In addition the registered CDM PDD /3/ version 02 dated 18/12/2009 and VCS PD /4/ version 01 dated 10/08/2011 in particular the baseline estimations and the monitoring plan, and the registered CDM validation report /4/ version 01 dated 21/01/2010 for the project, as well as relevant documents, were reviewed. A detailed documents reviewed are listed in Annex 1 of the report.

2.3 Interviews

The key personnel interviewed are summarized in the table below:

Interviewed personnel	Function	Organization
Mr. Cao Wanpeng	Engineer	Hebei Construction Investment New Energy Co., Ltd.
Mr. Song Nin	Engineer	Hebei Construction Investment New Energy Co., Ltd.
Mr. Li Yang	Engineer	Hebei Construction Investment New Energy Co., Ltd.

Ms. Xu Hongmei	Project Manager	Goldchina Consultancy International Co., Ltd.
Ms. Wang Yune	Villager	Kangbao County
Mr. Lv Qilong	Villager	Shijing Village
Mr. Li Xuejiu	Villager	Kangbao County

2.4 Site Inspections

The assessment team performed the on-site validation and verification on 22-23/03/2016. The interviewed personnel are listed in above table.

2.5 Resolution of Findings

As an outcome of the verification process, the team can raise different types of findings.

Where a non-conformance arises the assessment team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

The assessment team shall raise a Clarification Request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

2.5.1 Forward Action Requests

None FAR was raised during the verification process.

2.6 Eligibility for Validation Activities

Not applicable as LGAI Technological Center, S.A. holds the accreditation for the validation and verification for projects under scope 1.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Through reviewing the registered CDM PDD /3/ and validation report /4/ at UNFCCC website <http://cdm.unfccc.int/Projects/DB/BVQI1264129691.43/view>, it was validated that the project has been registered as a CDM project on 26/11/2010 with reference No. 3312. Also after checking http://www.vcsprojectdatabase.org/#/project_details/697, it is confirmed that the project also registered as a VCS project. The project does not participate in the other emissions trading program.

During the period from 26/11/2010 to 25/11/2017, the project would claim for other CERs or VCUs, however CERs and VCUs would not been claimed together in the same period.

Therefore, Applus+ LGAI consider the project is eligible to participate under the VCS Program as there is no double counting for the emission reduction during any period.

3.2 Methodology Deviations

Not applicable as not deviation for methodology.

3.3 Project Description Deviations

Not applicable as not deviation for project description.

3.4 Grouped Project

Not applicable as not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

By means of on-site visit, the assessment team confirms that all physical features of the proposed CDM project activity proposed in the registered CDM PDD /3/ and VCS PD /4/ are in place and the PP has operated the project as per the registered CDM PDD /3/ and VCS PD /4/. The installed capacity of the project is 49.5 MW, consisting of 33 sets of wind turbines with unit capacity of 1.5 MW. The electricity generated is transmitted to a 110 kV Substation then supplied to NCPG via Hebei Power Grid confirmed by checking Power Purchase Agreement (PPA) /18/ signed by the project owner and power grid company. The project activity was expected to supply 118,354.5 MWh of electricity to the grid. The construction of the project started on 01/05/2009, the first wind turbine of the project has been put into operation on 28/11/2009 and the commissioning time of all 33 wind turbines was 18/12/2009 verified by checking CDM validation report No. BVC/CHINA-VAL/0194/2009 /4/, version 01, completed on 21/01/2010 issued by BUREAU VERITAS CERTIFICATION. There are no changes on the key equipment and technology since the validation of the project. No special event which would affect the monitoring of the project has been observed during the monitoring period.

The technical parameters have been verified with the nameplates /12/ as well as the technical specification /10/ as below:

Parameter		Unit	Value
Model		-	GE1.5sle
Height of hub		m	80
Wind turbine	Rotor diameter	m	77
	Number of blades		3
	Rated wind speed	m/s	14
	Cut-in wind speed	m/s	3.5
	Cut-off wind speed	m/s	25
Generator	Rated power	kW	1,500
	Rated voltage	V	690

By comparing the actual ER claimed in this monitoring period with the estimate in the registered PDD, the actual emission reductions (161,836 tCO₂e) are 18.88% higher than what is stated in the registered CDM PDD (i.e. 136,133 tCO₂e, equals to annual emission reductions, 124,846 tCO₂e multiplied by the actual operational days (398 days) then divided by 365 days). This is due to below reason:

Annual average wind speed of the representative year and actual wind speed during this monitoring period are listed in table below. As is known, the average annual quantity of power generation is a parameter derived from theoretical calculation based on the wind resource data of the representative year which can reflect the mean level of wind energy in long term in some area. And wind speed is a key parameter which can essentially affect the quantity of power generation.

According to Statement for average wind speed issued by meteorological station of Kangbao County /19/ and FSR /20/. Comparison between actual wind speed and wind speed of representative year are listed as below:

Date	Wind speed (m/s)	Wind speed (m/s)
	Monitoring period	Representative year
Dec. 2011	10.5	7.5
Jan. 2012	9.45	6.4
Feb. 2012	8.2	8
Mar. 2012	10.1	8.1
Apr. 2012	9.6	8.3
May. 2012	10.35	9.5
Jun. 2012	6.5	6.4
Jul. 2012	6.5	6.6
Aug. 2012	5.4	5.7
Sep. 2012	6.8	7
Oct.2012	7.3	7.6
Nov. 2012	7.9	8.1
Dec. 2012	9.2	7.5
Average	8.29	7.44

The energy available in a wind stream is proportional to the cube of its speed¹, the wind speed in the monitoring period is 11.42% $((8.29-7.44)/7.44=11.42\%)$ higher than the wind speed of representative year, which means the wind energy in the monitoring period is 38.32% higher than that of the wind speed of representative year theoretically. So, it is reasonable that actual emission reductions during this monitoring period (from 30/11/2011 to 31/12/2012) 18.88% higher than the estimated emission reductions in the registered PDD. It can be concluded to the increase of emission reductions is due to wind speed fluctuation and not under the control of the project owner.

As per the results of sensitivity analysis in the PDD, if the annual net electricity increases by 20%, IRR of the project could achieve the benchmark. And then even the actual ERs increase by 18.88% in the current monitoring period over the estimated one in the PDD, it can be definitely concluded that the impact of temporary increase in actual ERs of this monitoring period on the additionality of the project is limited and cannot result in the break of the benchmark of 8%.

The assessment team confirmed that there is no proposed or actual change to the project design 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 Accuracy of GHG Emission Reduction and Removal Calculations

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CDM PDD /3/. All parameters were monitored and determined as per the monitoring plan which is listed in below table:

Data / Parameter:	EG _{facility,y}
Data unit:	MWh
Description:	Quantity of net electricity generation supplied by the proposed project to the grid in year y
Source of data used:	<u>Raw data source:</u> 153,422.280 (Calculated as below)

¹ $P = \frac{1}{2} \rho A v^3$, where P is the kinetic power, ρ is the air density, A is the area, v is the wind speed, source from Page 48 of *Developing Wind Power Projects: Theory and Practice* (written by Tore Wizelius), so, the wind energy is the proportional to the cube of its speed.

	$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y}$ <u>Method to obtain raw data:</u> Calculated as below: $EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y}$
Means of verification/Comments:	<u>Calibration:</u> Not applicable <u>Qualification/accreditation/authorization:</u> Not applicable <u>Completeness of data:</u> Not applicable <u>Verification of data:</u> Not applicable
Cross-check	Not applicable

Data / Parameter:	$EG_{\text{export},y}$
Data unit:	MWh
Description:	Electricity supplied by the project activity to the grid in year y
Source of data used:	<u>Raw data source:</u> The parameter is continuously measured and monthly recorded 153,657.240 (MRR /13/ and ETN /14/) <u>Method to obtain raw data:</u> At 00:00 of the last day of every month, the raw data of meter reading of M1 (bidirectional) installed on the main transmission line are recorded by the project owner and form Monthly Reading Record (MRR /13/), and then send to the power grid company, after the confirmation of power grid company, the power grid company will issue ETNs /14/. Then the conservative value between the Monthly Reading Record /13/ and ETNs /14/ issued by the power grid company would be used for ER calculation. All these have been confirmed by site visit.
Means of	<u>Calibration:</u>

verification/Comments:	The calibration information for M1 is shown as below by verified the calibration certificates /15/:			
	Meter	Model	Serial Number	Accuracy
	M1	DTSD341	09070111440058	0.2s
	Calibration Date		Validity Date	
	02/07/2011		01/07/2012	
	26/06/2012		25/06/2013	
	The M1 was calibrated by Zhangjiakou Electric Power Company Limited Power Energy Metering Centre.			
	<u>Qualification/accreditation/authorization:</u>			
	Zhangjiakou Electric Power Company Limited Power Energy Metering Centre was accredited by Hebei Province Bureau of Quality and Technical Supervision valid from 14/02/2012 to 13/02/2015 /16/			
	<u>Completeness of data:</u>			
MRR /13/ issued by the project owner, Statement issued by power grid company regarding to raw data for 31/12/2011 and 31/12/2012 /21/ and ETNs /14/ issued by the power grid company has been verified and the data is complete and covering the whole monitoring period.				
<u>Verification of data:</u>				
As verified by the assessment team, the data provided in the Monitoring Report is consistent with the ER Calculation Spreadsheet /2/ by checking MRR /13/ issued by the project owner, Statement issued by power grid company regarding to raw data for 31/12/2011 and 31/12/2012 /21/ and ETNs /14/ issued by the power grid company.				
Cross-check	MRR /13/ is crosscheck with ETNs /14/, the conservative value would be used for calculation.			

Data / Parameter:	EG _{import,y}
Data unit:	MWh
Description:	Electricity imported from the grid by the proposed project during year
Source of data used:	<u>Raw data source:</u>

	The parameter is continuously measured and monthly recorded 234.96 (MRR /13/ and ETN /14/) <u>Method to obtain raw data:</u> At 00:00 of the last day of every month, the raw data of meter reading of M1 (bidirectional) installed on the main transmission line are recorded by the project owner and form Monthly Reading Record (MRR /13/), and then send to the power grid company, after the confirmation of power grid company, the power grid company will issue ETNs /14/. Then the conservative value between the Monthly Reading Record /13/ and ETNs /14/ issued by the power grid company would be used for ER calculation. All these have been confirmed by site visit.																				
Means of verification/Comments:	<u>Calibration:</u> The calibration information for M1 is shown as below by verified the calibration certificates /15/: <table><tr><th>Meter</th><th>Model</th><th>Serial Number</th><th>Accuracy</th></tr><tr><td>M1</td><td>DTSD341</td><td>09070111440058</td><td>0.2s</td></tr><tr><th colspan="2">Calibration Date</th><th colspan="2">Validity Date</th></tr><tr><td colspan="2">02/07/2011</td><td colspan="2">01/07/2012</td></tr><tr><td colspan="2">26/06/2012</td><td colspan="2">25/06/2013</td></tr></table> The M1 was calibrated by Zhangjiakou Electric Power Company Limited Power Energy Metering Centre. <u>Qualification/accreditation/authorization:</u> Zhangjiakou Electric Power Company Limited Power Energy Metering Centre was accredited by Hebei Province Bureau of Quality and Technical Supervision valid from 14/02/2012 to 13/02/2015 /16/ <u>Completeness of data:</u> MRR /13/ issued by the project owner, Statement issued by power grid company regarding to raw data for 31/12/2011 and 31/12/2012 /21/ and ETNs /14/ issued by the power grid company has been verified and the data is complete and covering the whole monitoring period. <u>Verification of data:</u> As verified by the assessment team, the data provided in the Monitoring Report is consistent with the ER Calculation Spreadsheet /2/ by checking MRR /13/ issued by the project owner, Statement	Meter	Model	Serial Number	Accuracy	M1	DTSD341	09070111440058	0.2s	Calibration Date		Validity Date		02/07/2011		01/07/2012		26/06/2012		25/06/2013	
Meter	Model	Serial Number	Accuracy																		
M1	DTSD341	09070111440058	0.2s																		
Calibration Date		Validity Date																			
02/07/2011		01/07/2012																			
26/06/2012		25/06/2013																			

	issued by power grid company regarding to raw data for 31/12/2011 and 31/12/2012 /21/ and ETNs /14/ issued by the power grid company.
Cross-check	MRR /13/ is crosscheck with ETNs /14/, the conservative value would be used for calculation.

Parameters available at validation stage:

Below data has been verified against the data sources and the PDD.

Parameter title	Description	Data	Source
EF _{grid,CM,y}	Baseline emission factor of NCPG in the monitoring period.	1.05485	Notification on 2008 baseline emission factors for regional power grids in China, issued by China on 18/07/2008 /17/.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CDM PDD /3/ and revised monitoring plan /11/.

As a result of verification of the ER calculation process, the assessment team confirmed that all the parameters required for the determination of the emission reductions have been included in the MR Report and ER Calculation Spreadsheet /2/ and are consistent with the applied methodology ACM0002 version 10.0 and the monitoring plan contained in the registered CDM PDD. The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the ER Calculation Spreadsheet and the MR Report. The verification process for the same has been clearly described above in section 4.2 of the report.

4.4 Non-Permanence Risk Analysis

Sufficient evidences covering the full monitoring period in the required frequency are available to verify the figures stated in the final monitoring report. The source of the evidences has been discussed above. Specific cross-checks have been done in cases that further sources were available. The monitoring report's figures were checked by the assessment team against the raw data. The data collection system meets the requirements of the monitoring plan as per the methodology.

The assessment team confirmed the completeness, accuracy and reliability of the evidences available during the monitoring period, thereby the determination of GHG emission reductions or removals are appropriate.

The responsibilities of data measurement, collection, verifying, archiving etc. have been clearly defined in the CDM Monitoring Procedure /8/. The data related to ER calculation as well as data monitoring, collection process etc. have been internally reviewed by the management of the CDM team regularly. The responsibility of each function is consistent with the monitoring plan in the registered CDM PDD /3/.

The members involved in the CDM team have been trained with the CDM monitoring related issues. During the site visit the assessment team interviewed some personnel of the training issues and considered that the personnel are competent. Personal certificates of the plant operation have also been checked by the assessment team.

The information flow of each parameter has been verified by the assessment team via interviewing with responsible personnel and checking with the CDM Monitoring Procedure /8/. The details of information flow of each parameter are described above.

All the data and documents, either hard copies or electric copies, will be kept for two years after the end of the last crediting period or the last issuance of CERs for this Project, whichever occurs later.

5 VERIFICATION CONCLUSION

Applus+ LGAI has been commissioned by Goldchina Consultancy International Co., Ltd. to perform the verification of greenhouse gas emission reductions of the project activity “Kangbao Sanxiatian Wind Farm Project” (UNFCCC Ref. No. 3312, VCS Ref. No. 697).

The management of Hebei Construction Investment New Energy Co., Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the registered CDM PDD /3/, version 02, dated 18/12/2009 and the VCS Project Description /4/ dated 10/08/2011.

Our verification approach was based on the requirements as defined under the applicable VCS standards 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 CDM PDD and VCS PD;
- the monitoring plan in CDM PDD and VCS PD is as per the applied methodology;
- the monitoring complies with the monitoring plan in the registered CDM PDD and VCS PD;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS 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.

In our opinion, the GHG emission reductions for “Kangbao Sanxiatian Wind Farm Project” during the monitoring period 30/11/2011 to 31/12/2012 as reported in Monitoring Report, prepared on the basis of the project’s Monitoring Plan are fairly stated. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 30/11/2011 to 31/12/2012 (divided into 2 vintage periods). Verified GHG emission reductions or removals in the above reporting period:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage (tCO ₂ e)	Emission Reductions (tCO ₂ e)
30/11/2011 to 31/12/2011	12,219	0	0	12,219
01/01/2012 to 31/12/2012	149,617	0	0	149,617
Total	161,836	0	0	161,836

APPENDIX 1: REFERENCE LIST

1. Monitoring report, Version 01, dated 17/02/2016; version 02, dated 10/04/2016
2. ER calculation spreadsheet
3. Registered CDM PDD, Version 02, dated 18/12/2009
4. VCS Project Description, Version 01 dated 10/08/2011
5. Validation report, No. BVC/CHINA-VAL/0194/2009, version 01, completed by BUREAU VERITAS CERTIFICATION on 21/01/2010
6. VCS standard version 3.5, dated on 25/03/2015
7. Approved methodology ACM0002, version 10.0, dated 17/09/2010
8. Business license of Hebei Construction Investment New Energy Co., Ltd. effective from 17/07/2006 to 16/07/2026
9. CDM Monitoring procedure
10. Technical specification of the equipment
11. Revised monitoring plan approved by UNFCCC dated 13/10/2011
12. Nameplate of the equipment
13. Daily electricity meter reading records of meters covering the monitoring period
14. Electricity Transaction Notes covering the monitoring period
15. Calibration certificates of meters covering the whole monitoring period issued by Zhangjiakou Electric Power Company Limited Power Energy Metering Centre
16. Accreditation certificate of Zhangjiakou Electric Power Company Limited Power Energy Metering Centre valid from 14/02/2012 to 13/02/2015
17. Notification on 2008 baseline emission factors for regional power grids in China issued by China on 18/07/2008
18. Power Purchase Agreement (PPA) signed by project owner and power grid company
19. Statement for average wind speed issued by meteorological station of Kangbao County
20. FSR
21. Statement issued by power grid company regarding to raw data for 31/12/2011 and 31/12/2012