



VCS VERIFICATION/CERTIFICATION REPORT

VOLUNTARY CARBON STANDARD 2007.1



HEBEI KANGBAO SANXIATIAN WIND FARM PROJECT IN CHINA

VERIFICATION PERIOD:

1 December 2009 to 25 November 2010

REPORT No. 2011-9482

REVISION No. 01

DET NORSKE VERITAS



VCS VERIFICATION/CERTIFICATION REPORT

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Client: Hebei Construction Investment New-Energy Co., Ltd, Kangbao Sanxiatian Wind Energy Branch Company		Client ref.: Mr. Zhao Yongchao

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of emission reductions reported for the project activity "Hebei Kangbao Sanxiatian Wind Farm Project" in China, managed by Hebei Construction Investment New Energy Co., Ltd. for the period from 1 December 2009 to 25 November 2010. The project activity was validated as CDM project by Bureau Veritas Certification (report No: BVC/China-val/0194/2009, version 01 dated 21 January 2010) and it was registered as a CDM project on 26 November 2010 under the UNFCCC reference number 3312 with a renewable crediting period from 26 November 2010 to 25 November 2017. As emission reductions occur prior to the registration of the project as the CDM project activity, these emission reductions can not be claimed as Certified Emission Reductions (CERs). These emission reductions are thus claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard (VCS) 2007.1. This is in accordance to the eminent VCS Guidance for projects that are registered in the two GHG programs.

In DNV's opinion, the emissions reductions reported for "Hebei Kangbao Sanxiatian Wind Farm Project" in the VCU monitoring report version 02 dated 22 August 2011 are fairly stated. DNV is able to certify that the emission reductions from the Hebei Kangbao Sanxiatian Wind Farm Project during the period from 1 December 2009 to 25 November 2010 amount to 143 980 tonnes of CO₂ equivalent.

DNV does not assume any responsibility towards the issuance and utilization of 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 DNV and the engagement conditions detailed in this report. Hence, DNV cannot be held liable by any party for decisions made or not made based on this report.

Report No.: 2011-9482		Subject Group: Environment		Indexing terms <table><tr><td rowspan="4">Key words Climate Change Voluntary Carbon Unit VCS - Voluntary Carbon Standard 2007.1 Verification</td><td>Service Area Verification</td></tr><tr><td>Market Sector Renewable Energy</td></tr><tr><td></td></tr><tr><td></td></tr><tr><td colspan="3" rowspan="4">☒ No distribution without permission from the client or responsible organisational unit ☐ free distribution within DNV after 3 years ☐ Strictly confidential ☐ Unrestricted distribution</td><td colspan="2"></td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2"></td></tr></table>		Key words Climate Change Voluntary Carbon Unit VCS - Voluntary Carbon Standard 2007.1 Verification	Service Area Verification	Market Sector Renewable Energy			☒ No distribution without permission from the client or responsible organisational unit ☐ free distribution within DNV after 3 years ☐ Strictly confidential ☐ Unrestricted distribution										
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<i>Table of Content</i>	<i>Page</i>
1 INTRODUCTION	1
1.1 Objective	1
1.2 Scope and Criteria	2
1.3 VCS Project Description	3
1.4 Level of assurance	5
2 VERIFICATION METHODOLOGY	5
2.1 Review of Documentation	6
2.2 Site Visits	6
2.3 Assessment	7
2.4 Report of Findings	7
3 VERIFICATION FINDINGS	8
3.1 Remaining Issues from Previous Validation or Verification	8
3.2 Project Implementation	9
3.3 Completeness of Monitoring	12
3.4 Accuracy of Emission Reduction Calculations	16
3.5 Quality of Evidence to Determine Emission Reductions	18
3.6 Management System and Quality Assurance	19
4 CERTIFICATION AND VERIFICATION STATEMENT	20
5 REFERENCES	22
Appendix A Corrective Action Requests and Forward Action Requests	
Appendix B Clarification of clauses 1.12, 1.13, 1.14, 8.1 And 8.2 of the VCS 2007.1	

**Abbreviations**

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas AS
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
NCPG	North China Power Grid
NDRC	National Development and Reform Commission
ODA	Official Development Assistance
OM	Operating Margin
PD	Project Description
PDD	Project Design Document
PLF	Plant Load Factor
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention for Climate Change
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCU	Voluntary Carbon Unit
VER	Verified Emission Reductions
VVM	Validation and Verification Manual



1 INTRODUCTION

Hebei Construction Investment New-Energy Co., Ltd, Kangbao Sanxiatian Wind Energy Branch Company has commissioned DNV Climate Change Services AS (DNV) to carry out the verification of emissions reductions reported for the CDM project activity “Hebei Kangbao Sanxiatian Wind Farm Project” (UNFCCC Reference Number: 3312) for the verification period from 1 December 2009 to 25 November 2010, under the Voluntary Carbon Standard (VCS) program as per VCS 2007.1 standard /25/. The CDM crediting period starts from 26 November 2010 to 25 November 2017 /6/ with a CDM project starting date 19 February 2009 /2/ /3/. This verification aims to assess and verify the emission reduction occurred before the registration of the “Hebei Kangbao Sanxiatian Wind Farm Project” as a CDM project activity which was registered on 26 November 2010. Thus, this verification report contains (i) the findings from the verification according to Voluntary Carbon Standard 2007.1 /25/ and (ii) a VCU certification statement for the emission reductions.

The project activity was registered as CDM project (UNFCCC reference number 3312) on 26 November 2010 with the CDM crediting period starting on 26 November 2010. Additional information regarding the referred project is available at the UNFCCC website: <http://cdm.unfccc.int/Projects/DB/BVQI1264129691.43/view> /6/. The emission reductions occurring prior to the CDM registration date are claimed as Voluntary Carbon Unit (VCU) under VCS 2007.1 and in accordance to the VCS Guidance for projects that are registered in two GHG programs. These emission reductions can not be claimed as Certified Emission Reductions (CERs).

1.1 Objective

Verification of “pre-registration” emission reductions from a project activity is the independent review and *ex-post* determination by a Verification Entity or Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the implementation of an already registered CDM project activity during the 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 Executive Board (EB) and thus the start date of the CDM project activity.

Certification is the written assurance by a Certification Entity that, during a specific period in time, a project activity achieved the emission reductions as verified.

According to the “*Validation and Verification Manual*”, version 1.2 /21/ and the VCS Progame Guide 2007.1 /25/, the Certification Entity is defined as an entity which has been accredited as a DOE by the CDM Executive Board for the particular scope into which the project falls or has been accredited as an approved Certification Entity by the VCS Steering Committee. DNV is a Designated Operational Entities (DOEs) approve under the CDM for all sectoral scopes and DNV can thus perform VCS validation and VCS verification for the sectoral scope relevant for this project activity.

The objective of this verification was to verify and certify the voluntary emissions reductions reported for the “Hebei Kangbao Sanxiatian Wind Farm Project” for the period from 1 December 2009 to 25 November 2010.



1.2 Scope and Criteria

1.2.1 Scope of the verification

The scope of the verification is:

- Verify whether the reductions generated by the project are in line with the Verified Carbon Standard Verification Protocol and the information provided by the project participants contains all the necessary information to evidence the project's compliance with all criteria in the Voluntary Carbon Standard (VCS 2007.1) /25/;
- Verify that the project was implemented as described in the CDM Project Design Document (PDD) of version 02 dated 18 December 2009 /2/ equivalent to VCS PD during the verification period;
- Confirm that the monitoring system was implemented and fully functional to generate voluntary emission reductions (VCU*) without any double counting during the whole verification period;
- By checking the monitoring records and the emissions reduction calculation, express a conclusion whether reported data are accurate, complete, consistent, and transparent, with a high level of assurance and free of material error or misstatement;
- Validation of VCS requirements not covered by the CDM validation.

According to the VCS 2007.1 /25/, the verification also includes an independent third party assessment of the project design. In particular, the project baseline, monitoring plan and the project compliance with relevant applicable protocols and criteria (i.e. UNFCCC, VCS, host Party and others) are to be validated in order to confirm that the project design, as documented, is sound and reasonable and meets the applicable criteria.

The project design, its eligibility as CDM project activity and the correct application of the CDM approved baseline and monitoring methodology ACM0002 (Version 10) /22/ were all already validated by DOE Bureau Veritas Certification and the project was registered on 26 November 2010 as CDM project activity with the reference number 3312. The CDM validation opinion by Bureau Veritas Certification /3/ is that the "Hebei Kangbao Sanxiatian Wind Farm Project" as described in the PDD of 18 December 2009 (version 02) /2/ meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved baseline and monitoring methodologies ACM0002 (Version 10) /22/. Based on the CDM validation opinion of Bureau Veritas Certification and also based on the registration of the project as a CDM project activity by CDM EB/UNFCCC /3/ /6/, DNV assumes that the project design as documented is sound, reasonable and meets the relevant UNFCCC and host Party criteria.

As the VCS recognizes the CDM as a GHG Program that meets its VCU Verification Criteria /27/, this VCU verification report thus only addresses VCS specific and unique criteria in

* As per VCS, Verified Emission Reductions (VERs) are considered to be VCUs only after successful registration in an approved VCU Registry.



terms of project design, applicability to the adopted methodology and additionality that have not been so far addressed in the validation report /3/ as per CDM requirements.

1.2.2 Validation Criteria for VCS requirements not covered by CDM validation

As the project has been validated under the CDM /6/, a further validation shall be completed of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template /29/ (<http://v-c-s.org/docs/VCS%20PD.doc>) as required by the current VCS 2007.1 “Policy Announcement from the VCS Association - Further Guidance for Projects that are Registered in Two GHG Programs” /27/. This validation was completed as part of the current VCU verification (refer to Appendix B).

1.2.3 Verification Criteria

The verification team has focused on the identification of significant reporting risks and verifying the mitigation measures for these based on the recommendations in the Validation and Verification Manual version 1.2 /21/, ISAE3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information /23/ and/or ISO/FDIS 14064-3 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions and employed a risk-based approach /24/.

According to the requirements and guidance of VCS 2007.1 /26/ the criteria of this verification include the relevant applicable rules and steps for CER verification under the CDM excluding:

- The public availability of the VER/VCS Monitoring Report;
- The public availability the Verification Report and VCU Certification Statement.

1.3 VCS Project Description

1.3.1 Project Category

According to the VCS 2007.1 Guidelines /26/ and the list of Sectoral Scopes of the UNFCCC, the project is applicable under the following activity categories:

- Category 1 – Renewable energy (wind, PV, solar, thermal, biomass, liquid biofuels, geothermal, run-of-river hydro).

According to Annex A of the Kyoto Protocol, the project is applicable under the sectoral scope 1

- Energy Industries (renewable/ non-renewable sources).

1.3.2 Geographic Location

The project is located in Kangbao County, Zhanjiakou City, Hebei Province, P. R. China. The exact location of the project center is north latitude 41°53'57.6" and east longitude 114°29'47.3" as per the CDM registered PDD version 02 dated 18 December 2009 /2/ and this is confirmed during the site visit as describe in section 2.2 of this report.

1.3.3 Project Background

The project is a wind farm developed by Hebei Construction Investment New Energy Co., Ltd.. The installed capacity is 49.5 MW consisting 33 turbines of 1.5 MW each. The details of the turbines with respect to their numbers, type and model of the machines have been verified



to be consistent with the details provided in registered CDM PDD of version 02 dated 18 December 2009 /2/. The project started construction on 1 May 2009 /15/ and has passed the project completion check & acceptance on 21 December 2009 /16/ indicating the first turbine generating electricity on 28 November 2009.

This project has chosen a seven-year renewable crediting period under CDM with the starting from 26 November 2010 to 25 November 2017 and the project was registered on 26 November 2010 /6/. The VCS monitoring period was from 1 December 2009 to 25 November 2010 and the VCS crediting period is from 1 December 2009 to 25 November 2010 /1/. The reported emission reduction for the project during the VCS period of 1 December 2009 to 25 November 2010 is 143 980 tCO₂e /1/ /9/.

The project has the actual net electricity supplied to the grid of 136 493.913 MWh during the period of 1 December 2009 to 25 November 2010 /1/. The electricity generated is supplied to NCPG (which is predominately sourced by coal-fired power plants) under Power Purchase Agreement (PPA) /8/. The electricity with voltage of 690 V generated by the wind turbines is increased to 35 kV through the on-site 35 kV box transformers for each turbine; the electricity with voltage of 35 kV is increased to 110 kV by the 110 kV transformer at project site; the 110 kV electricity is finally supplied to the Kangbao 110 kV substation of the grid company.

As the project activity is the installation of a new grid-connected renewable power plant, the project reduces GHG emissions by displacing electricity that would have been generated in the existing fossil fuel powered plants in the grid or by the addition of new generation. The projects emission reductions are determined by multiplying the net amount of electricity generated by the project with an estimated *ex-ante* fixed grid emission coefficient of 1.05485 tCO₂e/MWh /2/ /3/.

The CDM baseline and monitoring methodology used is ACM0002 – “Consolidated methodology for grid-connected electricity generation from renewable sources” (Version 10) /22/.

Project Participants	Hebei Construction Investment New Energy Co., Ltd. (host party, China).
Title of the project activity:	Hebei Kangbao Sanxiatian Wind Farm Project
Location of the project activity:	Kangbao County, Zhanjiakou City, Hebei Province, P. R. China
VCU Verification period:	1 December 2009 to 25 November 2010
VCS Project Crediting period:	1 December 2009 to 25 November 2010
CDM Crediting period:	26 November 2010 to 25 November 2017 (Renewable)
Project Commissioning date:	28 November 2009
CDM Project Starting date:	19 February 2009
CDM Baseline and monitoring	
Methodology:	ACM0002 Version 10
UNFCCC Refer. No:	3312
Project Entity:	Hebei Construction Investment New Energy Co., Ltd.



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1.4 Level of assurance

As the VCS 2007.1 only recognizes verified emission reductions, DNV has focused on providing a reasonable level of assurance that the emission reduction calculation methodology used is appropriate and correctly applied, and that emission reductions have been accurately monitored.

DNV may discount verified emission reductions or requests a discount of these by using conservative assumptions for uncertainties in emission reduction calculations that cannot be fully quantified or that cannot give a desired level of assurance. For verifying/certifying VCUs, the desired level of assurance was based on the combined quantitative assessment of the accuracy of monitoring project performance and the identification of material risks.

2 VERIFICATION METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project according to applicable large-scale CDM methodology ACM0002 (Version 10) /22/, including the net electricity supplied by the project activity to NCPG multiplied by the validated grid emission factor. The verification team and the timeline of the entire verification process are listed in the following Table 1 and

Table 2.

Table 1 Verification Team

Role	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Verifier)	Gong	Zheng	China	✓	✓	✓			✓
Verifier	Tang	Zhiang	China	✓	✓	✓	✓		✓
Technical reviewer (applicant)	Dudek	Agnes	Norway					✓	✓
Technical Reviewer	Lai	Chee Keong	China					✓	✓

**Table 2** Duration of the verification

Preparation	27 June 2011 to 5 July 2011
On-site Verification	6 July 2011 to 7 July 2011
Checking of documentation with the project participants	7 July 2011
Reporting & QA	8 July 2011 – 23 August 2011

2.1 Review of Documentation

The following documents were assessed as part of the verification audit:

- The VER/VCU Monitoring Report of version 01 of 17 June 2011 and version 02 of 22 August 2011 for the period from 1 December 2009 to 25 November 2010 /1/.
- VCU calculation spreadsheet for Hebei Kangbao Sanxiatian Wind Farm Project /9/, provided by Hebei Construction Investment New Energy Co., Ltd..
- Original data records of the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /10/.
- Monthly monitoring reports on the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /11/.
- Monthly electricity receipts for the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /12/.
- CDM and Monitoring monthly training records of Hebei Kangbao Sanxiatian Wind Farm Project, from January 2010 to March 2011 /13/.
- Power Purchase Agreement for Hebei Kangbao Sanxiatian Wind Farm Project, dated September 2009 /8/.
- Registered CDM PDD as well as its monitoring plan for Hebei Kangbao Sanxiatian Wind Farm Project, version 02 dated 18 December 2009 /2/.
- CDM Validation Report for Hebei Kangbao Sanxiatian Wind Farm Project, version 01 dated 21 January 2010 by Bureau Veritas Certification /3/.
- Approved CDM methodology “Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources”, Version 10 /22/.

2.2 Site Visits

From 6 July 2011 to 7 July 2011, DNV verifier Gong Zheng and Tang Zhiang performed the site visit at Kangbao County, Zhanjiakou City, Hebei Province, P. R. China.

During the site visit, representative of DNV has interviewed key personnel from the plant /32/ and verified that the actual implementation of the project was as described in the registered CDM PDD /2/ and the VER/VCU Monitoring Report /1/. This included confirming the operational stages of the project with physical and documented evidences. DNV’s assessment included in particular the verification of original monitoring records /10/, monthly monitoring reports /11/, VCU calculation spreadsheet /9/ as well as the effectiveness of electricity generation (as described in the section 3 of this verification report) and the monitoring of net



electricity exported to the NCPG by the project. Moreover, the electricity sales receipts for the exported and imported electricity /12/ and the calibration records for monitoring meters /14/ were checked.

The verification of reported data was carried out by means of:

- Checking the monthly monitoring reports on the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /11/.
- Cross-checking the original data records on the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /10/
- Cross-checking the monthly electricity sales receipts for the electricity exported and imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010 /12/
- Verifying the testing certificates and calibration records for the main meter M1/14/.
- Verifying the effectiveness of the data quality assurance or quality control.

The persons interviewed during the audit are listed in the reference section of this project /32/.

2.3 Assessment

The analysis of documentation, interviews and site visit allowed the assessment of the following processes and assumptions (including QA/QC related issues):

- Monitoring of electricity exported to- and imported from the grid is verified to be continuously monitored. The amount of exported and imported electricity was assessed with the monthly monitoring reports /11/ and cross checked with the original monitoring records /10/ and the monthly electricity sales receipts /12/. The amount of emission reduction generated by the project activity during this monitoring period will be equal to the value of net electricity supplied to the grid multiplied by the grid emission factor (1.05485 tonCO₂/MWh) defined ex-ante in the registered CDM project activity /2/.

The verification of reported data and information was carried out by means of:

- Checking individual internal measuring records for electricity generation;
- Confirmation of the correct compilation of emission reduction calculation spreadsheets (values included in the spreadsheet were individually checked against the records listed above);
- Verifying the effectiveness of the data quality assurance and control;
- Confirmation that the registered CDM project activity meets the additional VCS 2007.1 requirements /25/.

2.4 Report of Findings

Findings established during the verification may be that:



- i) the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;
- ii) the verification has identified material misstatements in the reported emission reductions.

While aiming to resolve any outstanding issues which needed be clarified about the project design, findings established during the verification can either be seen as a non-fulfilment of the VCU Verification Criteria or where a risk to the fulfilment of project objectives is identified. Emission reductions with material misstatements shall be discounted based on the verifiers' *ex-post* determination of the achieved emission reductions.

A corrective action request (CAR) is issued, 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 participants.

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.

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

While aiming to resolve any outstanding issues which need to be clarified about the project design, findings established during the verification can either be seen as a non-fulfilment of the VCS requirements or where a risk to the fulfilment of project objectives is identified. Emission reductions with material misstatements shall be discounted based on the verifiers' *ex-post* determination of the achieved emission reductions.

One CAR and three CLs were observed in this periodical verification.

DNV was able to verify that the GHG emission reductions reported for the "Hebei Kangbao Sanxiatian Wind Farm Project" in the VCU monitoring report of version 02 dated 22 August 2011 /1/ are fairly stated.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the voluntary emission reductions reported for the "Hebei Kangbao Sanxiatian Wind Farm Project" for the period from 1 December 2009 to 25 November 2010. The findings of the verification are documented in more detail in the initial verification checklist given in Appendix A.

3.1 Remaining Issues from Previous Validation or Verification

This is the first verification and certification of the Voluntary Carbon Units (VCU), under the Voluntary Carbon Standard (VCS 2007.1), for Hebei Kangbao Sanxiatian Wind Farm Project. No previous VCS verification report is found. No FAR were identified with regards to remaining issues from the CDM validation stage /3/.



3.2 Project Implementation

The project is a wind farm developed by Hebei Construction Investment New Energy Co., Ltd.. The installed capacity is 49.5 MW consisting 33 wind turbines of 1.5 MW each. The details of the turbines with respect to their numbers, type and model of the machines have been verified on site through a visual inspection of the monitor center and through a random sample check of the wind towers. DNV confirms that the project implementation is consistent with the details provided in CDM PDD of version 02 dated 18 December 2009 /2/. The project started construction on 1 May 2009 /15/ and has passed the project completion check & acceptance on 21 December 2009 /16/ indicating the first turbine generating electricity on 28 November 2009.

The project has the actual net electricity supplied to the grid of 136 493.913 MWh during the period from 1 December 2009 to 25 November 2010 /1/. The electricity generated is supplied to NCPG under Power Purchase Agreement (PPA) /8/. The generated electricity is increased to 110 kV by the 110 kV transformer at project site; the 110 kV electricity is finally supplied to the Kangbao 110 kV substation of the grid company.

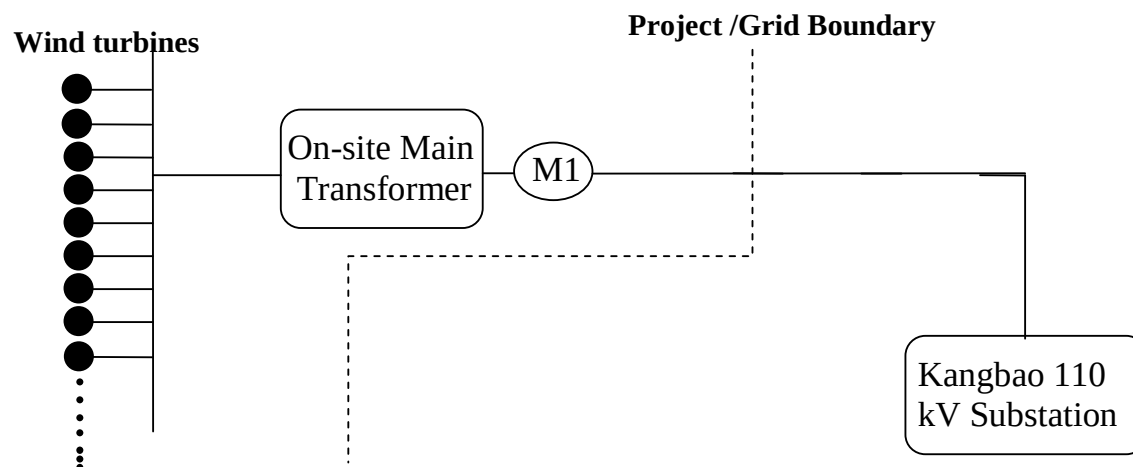
DNV verified that the project is fully implemented according to the description in the CDM registered PDD /2/. The verification team confirmed through visual inspection and document review that all physical features of the proposed VCS project activity including data collection systems and storage systems have been implemented in accordance with the CDM registered PDD /2/. No malfunction was occurred on the operation of equipments during this monitoring period which is confirmed during site visit.

The installation of the monitoring meter M1 is shown in Figure 1 below. The main meter M1 (Serial No. 09070111440058) with the accuracy level of 0.2s was installed at the high voltage of the 110 kV transformer at project site and belong to the project owner. The accuracy 0.2s of M1 is consistent with the monitoring plan of registered PDD /2/ and meets the requirement of power industry code (DL/T 448-2000) /28/ and thus deemed acceptable by DNV. The main meter M1 was used by project owner to measure the electricity exported to the grid as per PPA /8/, which is fully consistent with PDD /2/. The readings of meter M1 were continuously measured and monthly recorded by the project owner. On the last day of every month, the project owner and the grid company jointly read the main meter M1 and after the readings were confirmed by both sides the grid company issued the monthly electricity sales receipts /12/.

The installation and operation of the monitoring meter M1 was checked through visual inspection at the project site during site visit. The monitoring meter was consistent with the monitoring plan contained in the registered PDD /2/. The meter was calibrated once a year /14/ which is consistent with the monitoring plan of the registered PDD /2/.

The monitoring procedures of electricity exported to and imported from the grid were verified during the site visit and considered adequate /30/. The routine internal training records /13/ have also been verified by DNV during on site visit and considered appropriate. Malfunctioning of equipment has been monitored and recorded through the operation logs for turbines /30/. DNV has checked the operation logs during site visit and confirmed that no malfunctioning has been found for this monitoring period.

The control system at the wind power plant is automated and assures continuous operation according the availability of wind resource.

Figure 1 Diagram of meters installation

3.2.1 Eligible GHGs

The project activity contributes to reductions in the emissions of carbon dioxide (CO₂) by generating electricity using a renewable source, thus, displacing electricity generation based on fossil fuels in the NCPG.

3.2.2 Project Start Date and Emission Reduction Start Date

The starting date of the project activity is 19 February 2009 as per the registered PDD version 02 dated 18 December 2009 /2/ and CDM validation report version 01 dated 21 January 2010 /3/. The VCU emission reduction start date was 28 November 2009 when the first wind turbine was put into operation /16/.

3.2.3 Public Funding and Grants

The validation of the CDM project did not reveal any information that indicated that the project received any public funding or ODA as per the CDM validation report /2/ /3/.

3.2.4 Project Boundary/GHG Assessment Boundary

The project boundary is clearly defined as the site of the project activity and the NCPG, which consists of Beijing, Tianjin, Hebei, Shanxi, Shandong and Inner Mongolia power grids /2/ /3/.

3.2.5 Baseline Determination

As the project design was previously assessed by Bureau Veritas Certification as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) and as the project was registered by the CDM EB as a eligible CDM project activity, it is thus confirmed that:

- i) The project correctly applies the approved baseline and monitoring methodology ACM0002 (Version 10) titled "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*" /22/.



ii) The baseline scenario is provision of equivalent electricity that would, in the absence of the project activity, being generated by the operation of the grid-connected power plants within the NCPG.

3.2.6 Project Additionality

As the project design was previously assessed by Bureau Veritas Certification as part of the CDM validation phase in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria and the project was registered by the CDM EB as a eligible CDM project activity, it is thus confirmed that project is not a likely baseline scenario, and that emission reductions resulting from the project are additional.

Detailed information regarding project additionality is available at:

- i) CDM PDD version 02 of 18 December 2009 /2/.
- ii) Bureau Veritas Certification, CDM validation report version 01 dated 21 January 2010 /3/.

It is in DNV's opinion that the project is additional to any emission reductions occurring in absence of the project.

3.2.7 GHG Emission

As the project design has been previously assessed by Bureau Veritas Certification as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) and as the project has been registered by the CDM EB as a eligible CDM project activity, it is confirmed that the approach for determining project and baseline emissions are appropriate and in accordance with the selected baseline and monitoring methodologies.

The calculation of the baseline emission factor was performed as required by the methodology. The parameters were calculated *ex-ante*. The Operating Margin (OM) emission factor calculation was based on the simple OM method, option (a) of the ACM0002. This method was selected because low cost/ must run resources constitute less than 50% of total grid generation in average of the five most recent years.

The Build Margin (BM) emission factor was also calculated *ex-ante* based on the most recent information available at the time of PDD submission (data from year 2004 to year 2006). Details about the data used for calculation of OM and BM emission factors were presented in the EF calculation spreadsheet /4/ and the sources of data were verified by the DNV during the site visit.

The grid emission factor calculated *ex-ante* from OM and BM emission factors above mentioned and applied for baseline emission reductions estimative was 1.05485 tCO₂/MWh /2/ /3/ /4/.

DNV has checked the registered CDM documents of the project downloaded from UNFCCC website /6/ and found the values are consistent with the values used in the monitoring report /1/.

The reported GHG emission reductions from the project are 143 980 tCO₂e during the period from 1 December 2009 to 25 November 2010 /1/ /2/ /3/.



3.2.8 Secondary Effects

Regarding secondary effects (leakage), although no leakage calculation is needed, as explained in the applicable methodologies; no sources of leakage were identified as the electricity generating equipment is not transferred from any other activity.

3.2.9 Impacts on Sustainable Development

As the project design was previously assessed by Bureau Veritas Certification as party of the CDM validation phase /3/ (in particular in terms environmental impacts and comments by local stakeholder, parties and NGOs in order to comply with relevant UNFCCC and host Party criteria) and as the project was registered by the CDM EB as a eligible CDM project activity, it is DNV's contention that the project's social and environmental impacts have been sufficiently addressed /3/. DNV can confirm from the site visit that the project's social and environmental impacts have been sufficiently addressed. In addition, the DNA of China has provided confirmation that the project assists in achieving sustainable development, through the Letter of Approval issued on July 2008 /18/.

3.3 Completeness of Monitoring

As the project design was previously assessed by the Designated Operational Entity (DOE) Bureau Veritas Certification as part of the CDM validation phase (in particular in terms of the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria) /3/ and as the project was registered by the CDM EB as a eligible CDM project activity /6/, it is DNV's contention that the application of the monitoring methodology is transparent.

The monitoring plan in the registered CDM PDD of version 02 of 18 December 2009 /2/ only requires the monitoring of the net electricity supplied to the NCPG. According to the registered CDM validation report /3/, the emission factor of the project is determined to be fixed *ex-ante* as 1.05485 tCO₂e/MWh for the first crediting period.

As per the registered CDM PDD /2/, the main meter M1 was installed on site to monitor the electricity exported to- and import from grid.

The monitoring has been verified to be in accordance with the monitoring plan contained in the registered CDM PDD of 18 December 2009 (version 02) /2/, as presented in the following Table 3. The monitoring report and other supporting documents provided are complete and verifiable.

DNV can confirm that the monitoring plan and the applied methodology have been properly implemented and followed by the project owner in this verification period (1 December 2009 to 25 November 2010).

Table 3 Monitoring Verification Table

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	$EG_{facility, y}$ - Quantity of net electricity supplied to grid by the project activity in the year y is calculated as follow: $EG_{export, y}$ minus $EG_{import, y}$. Where $EG_{export, y}$ is the electricity delivered by the project to grid in year y and $EG_{import, y}$ is the electricity purchased by the project from grid in



	year y.
Measuring frequency:	Continuously measured.
Reporting frequency:	Monthly recorded and reported.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Electricity meter: The main meter M1 (Serial No. 09070111440058) with the accuracy level of 0.2s was installed at the high voltage of the 110 kV transformer at project site and belong to the project owner. The meter M1 is used to monitor the electricity export and electricity imported.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy level of main meter M1 is 0.2s, which is consistent with the specification in the monitoring plan of registered PDD /2/.
Calibration frequency /interval:	Once a year.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The main meter M1 was calibrated every year, which is consistent with the monitoring plan of registered PDD /2/.
Company performing the calibration:	The calibrations of meter M1 were conducted by Zhanjiakou Power Supply Bureau /14/ on 8 September 2009 and 4 July 2010, which has been reviewed by DNV. The certificate of Metrological Authorization for Zhanjiakou Power Supply Bureau was accredited by the Quality and Technology Supervision Bureau of Hebei Province on 18 February 2008 (valid to 17 February 2011) /14/, which has been reviewed by DNV.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes.
Is(are) calibration(s) valid for the whole reporting period?	Yes. The main meter M1 was calibrated by a third party on 8 September 2009 with the validity period of one year reaching to 7 September 2010 /14/ and also calibrated on 4 July 2010 with the validity period of one year reaching to 3 July 2011 /14/. Thus, DNV deems that the calibrations of main meter M1 covered the monitoring period of 1 December 2009 to 25 November 2010.



If applicable, has the reported data been cross-checked with other available data?	Yes. The reported data has been cross-checked with original monitoring records /10/, monthly monitoring report /11/, the monthly electricity sales receipts /12/.
How were the values in the monitoring report verified?	As per the PPA /8/, the exported electricity was measured by the main meter M1 at project site; the imported electricity was also measured by the main meter M1 at the project site. The net electricity which is determined by the electricity exported to the grid minus the electricity imported from the grid is the base data for the calculation of the emission reduction. The input data for the electricity exported by the project (M1) and the electricity imported from the grid (M1) in the ER calculation spreadsheet /9/ were taken from monthly monitoring reports /11/ and cross-checked with original data records /10/ and monthly sales receipts /12/. DNV verified that the values of the exported and imported electricity during this monitoring period are consistent between them /9/ /10/ /11/ /12/. The monthly reading time of main meter M1 is at 24:00 on the last day of every month according to the PPA /8/. The project started to generate electricity on 28 November 2009 when the first wind turbine was put into operation /16/, and by the end of December 2009, all the 33 wind turbines were put into operation /16/. The meter readings for meter M1 at 00:00 on 24 November 2010 and at 24:00 on 25 November 2010 were confirmed by the grid company /10/. The input data from 24 November 2010 and at 24:00 on 25 November 2010 in the ER calculation spreadsheet /9/ were cross-checked by DNV with this electricity sales receipts of November 2010 /12/ and found to be consistent. All original records /10/, monitoring reports /11/ and electricity sales receipts /12/ have been verified by DNV on the project site during the verification. DNV was able to confirm the calculating process and the conclusion is transparent and conservative.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct	In order to monitor the net electricity supplied to the NCPG by the proposed project, the main meter M1 with the accuracy level of 0.2s was



transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?

installed at the high voltage of the 110 kV transformer at project site to monitor the exported electricity; the same meter M1 is also installed to monitor the imported electricity.

With the computer-monitoring system, meter M1 continuously monitored and monthly recorded by the staff on duty /10/. The data were combined into a monthly report /11/ which should be submitted to the CDM responsible person for review /32/. The monthly monitoring reports /11/ were finally reviewed and approved by the manager every month. The approved monthly monitoring reports /11/ are the basis for emission reduction calculations /9/. During the site visit, the monthly monitoring reports during the monitoring period /11/ have been cross-checked by DNV with the original data on settlement day in the end of every month /10/. Thus, DNV can confirm that the values of electricity exports and imports are consistent between the monthly monitoring reports /11/ and the original data records on settlement day /10/.

On the last day of every month, the project owner and the grid company jointly read the meter M1. And after the readings were confirmed by both sides, the grid company issued the monthly electricity sales receipts for the electricity exported and imported /12/. During the site visit, the monthly monitoring reports /11/ have been cross-checked by DNV with monthly electricity sales receipts /12/. Thus, DNV can confirm that the values of electricity exports and imports are consistent between the monthly monitoring reports /11/ and the monthly electricity sales receipts /12/.

The meter is jointly inspected and sealed on behalf of the parties and is not interfered with by either party except in the presence of the other party or its accredited representatives. The general conditions set out for metering, recording, meter readings, meter inspections, test & checking and communication are as per the PPA (Power Purchase Agreement) /8/ with Zhanjiakou Power Supply Bureau.



	All relevant documents and records will be stored electronically and kept two years after the crediting period. The management system for the CDM project is in place. The organization structure with the responsibilities, personnel competencies, monitoring procedure, calculation procedure and QA/QC procedure have been properly identified and put in place. By interviewing with some staff /32/ on site and checking of monitoring reports /1/ and training records /13/, it can be confirmed that the monitoring management system is correctly implemented.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	N/A

3.4 Accuracy of Emission Reduction Calculations

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 Version 10 /22/, the formulae given in the VCU monitoring report of 22 August 2011 version 02 /1/ and also based on the validation opinion stated in the CDM validation report issued by the DOE Bureau Veritas Certification for the registered CDM project activity /3/.

The GHG emission reductions ER_y by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y). The formula is: $ER_y = BE_y - PE_y - L_y = BE_y$.

Where, PE_y and L_y are considered to be zero as per ACM0002 of Version 10 /22/ and registered CDM PDD /2/. Thus, the emission reductions are:

$$ER_y = BE_y = EG_{\text{facility}} * EF_y.$$

Thus, the emission reductions (ER_y in tCO_2e) are the product of the baseline emissions factor (EF_y in tCO_2e /MWh) times the net electricity supplied by the project to the grid (EG_{facility} in MWh).

The baseline emission factor of $1.05485 tCO_2e/MWh$ is fixed *ex-ante* for the first crediting period which was given in the CDM validation report /3/ as discussed in section 3.2.7 above.

The net power supplied by the project to grid is calculated as the electricity exported to the grid minus the electricity imported from the grid on a monthly basis by monitoring the electricity exported and imported. The input data for the electricity exported by the project and imported from the grid in the ER calculation spreadsheet /9/ were taken from monthly monitoring reports /11/ and cross-checked with original data records /10/ and monthly electricity sales receipts /12/. DNV verified that the values of the exported and imported



electricity during this monitoring period are consistent between them /9/ /10/ /11/ /12/. The net electricity supplied by the project to the grid for the monitoring period is calculated as 136 493.913 MWh by accumulating the monthly net electricity supplied to the grid /9/.

The claimed emission reductions are therefore 143 980 tCO₂e for the monitoring period of 1 December 2009 to 25 November 2010.

The input data for calculation /10/ /11/ /12/ as well as the calculation process and result /9/ are verified by DNV and deemed to be complete and transparent, and DNV is able to confirm the accuracy.

The net electricity generated by the project is supplied to the NCPG under the PPA /8/. During the monitoring period of 1 December 2009 to 25 November 2010, covering 360 days, the exported electricity and the imported electricity are 136 662.477 MWh and 168.564 MWh respectively. The net electricity supplied to the grid has been used for the purpose of PLF calculation. The plant load factor during this monitoring period is 31.95% [136 662.477 MWh / (49.5 MW * 360days * 24 h/day)], which is higher than the expected average plant load factor of 27.29% [118 354.5MWh / (49.5MW * 365 days * 24 h/day)] as indicated in the registered PDD /2/. The monthly PLF is shown in the Table 4 below.

Table 4 The monthly PLF of the project

Period	Exported electricity (MWh)	Imported electricity (MWh)	Operation days	Plant load factor
	A	B	D	A/(D*49.5*24)
2009.12.1-2009.12.31	14 309.816	1.584	31	38.86%
2010.1.1-2010.1.31	15 023.442	23.364	31	40.79%
2010.2.1-2010.2.28	10 739.904	14.784	28	32.45%
2010.3.1-2010.3.31	14 752.950	13.332	31	40.06%
2010.4.1-2010.4.30	14 389.356	11.616	30	40.37%
2010.5.1-2010.5.31	14 721.151	5.148	31	39.97%
2010.6.1-2010.6.30	7 861.553	16.500	30	22.06%
2010.7.1-2010.7.31	7 807.887	18.876	31	21.20%
2010.8.1-2010.8.31	8 770.428	15.840	31	23.81%
2010.9.1-2010.9.30	6 616.449	27.720	30	18.56%
2010.10.1-2010.10.31	9 794.448	14.520	31	26.60%
2010.11.1-2010.11.25	11 875.093	5.280	25	39.98%
Total/average	136 662.477	168.564	360	31.95%

It was observed from Table 4 that the total electricity output/PLF is 16.93% higher than the estimation in the registered PDD /2/. The higher value is justified as follows:



The electricity increases due to many reasons at the real practise: higher speed resource; better turbine efficiency; lower down time/good maintenance on equipments etc. All these could have attributed to the higher generation of electricity.

According to the FSR /31/, the average annual quantity of power generation was estimated 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. The average annual wind speed of this monitoring period is higher than the one of Representative Year /31/. The wind speed monitored onsite during the period from December 2006 to November 2010 was further checked by DNV /20/, the wind speed reached the highest value in the year 2009 (with a monitoring wind speed period December 2008 to November 2009) /20/. From the records, DNV can conclude that the wind speed is higher compared to the information used in the FSR to estimate electricity generation. DNV could confirm that the higher electricity generation compared to the estimate in PDD was mainly due to good wind speed in this monitoring period. Therefore, it is reasonable to attribute the increase of electricity generation to the increase of wind energy

DNV is able to confirm that the PLF from 1 December 2009 to 25 November 2010 of the project is reasonable. And the actual emission reductions during the monitoring period of 1 December 2009 to 25 November 2010 (360 days) is 143 980 tCO₂e /1/.

In conclusion, DNV is able to confirm that the data were complete and available; calculations of baseline emissions, project emissions and leakage have been carried out in accordance with the methods and formulae described in the monitoring plan of the registered CDM PDD /2/, CDM validation report /3/ and the approved CDM methodology ACM0002 (Version 10); the assumptions, emission factors and default values that were applied in the calculations have been verified to be correct.

3.5 Quality of Evidence to Determine Emission Reductions

The emission reductions for the project are determined by the emission factor multiplied by net power supplied to grid. The emission factor was *ex-ante* fixed for the first crediting period, and the only parameter to be monitored for this project is the net power supplied to grid.

As per the PPA /8/, one main meter M1 with the accuracy level of 0.2s was installed at the high voltage of the 110 kV transformer at project site to monitor the export and import electricity. This was verified by DNV during the onsite visit. The net electricity which is calculated as the electricity export to the grid minus the electricity import from the grid is the base data for the calculation of the emission reduction.

With the computer-monitoring system, reading from main meter M1 is continuously monitored and monthly recorded by the staff on duty. The data were combined into a monthly report /11/ which was then submitted to the responsible person for review. The monthly monitoring reports /11/ were finally reviewed and approved by the manager every month. The approved monthly monitoring reports /11/ are the basis for emission reduction calculations. During the onsite visit, the monthly monitoring reports during the monitoring period /11/ have been cross-checked by DNV with the original data on settlement day on the last day of every month /10/. Thus, DNV can confirm that the values of electricity exports and imports are consistent between the monthly monitoring reports /11/ and the original data records on settlement day /10/.

On settlement day, the last day of every month, the project owner and the grid company



jointly read the meter M1, and after the readings were confirmed by both sides the grid company issued the monthly electricity sales receipts for the electricity exported and imported /12/. During the site visit, the monthly monitoring reports covering the monitoring period /11/ have been cross-checked by DNV with monthly electricity sales receipts /12/. Thus, DNV can confirm that the values of electricity exports and imports are consistent between the monthly monitoring reports /11/ and the monthly electricity sales receipts /12/.

The monthly reading time of main meter M1 is at 24:00 on the last day of every month according to the PPA /8/. The project started to generate electricity on 28 November 2009 when the first wind turbine was put into operation /16/, and in the end of December 2009, all the 33 wind turbines were put into operation /16/. The meter readings for meter M1 at 00:00 on 24 November 2010 and at 24:00 on 25 November 2010 were confirmed by the grid company /10/. The input data from 24 November 2010 and at 24:00 on 25 November 2010 in the ER calculation spreadsheet /9/ were cross-checked by DNV with this electricity sales receipts of November 2010 /12/ and found to be consistent.

All original records /10/, monitoring reports /11/ and electricity sales receipts /12/ have been verified by DNV on the project site during the onsite visit. DNV was able to confirm that the calculating process and the conclusion is transparent and conservative.

The calibration records of the electricity meter /14/ and the qualification of the third party to carry out this calibration /14/ have been verified by DNV and deemed reasonable and acceptable.

All original records /10/, monitoring reports /11/ and electricity sales receipts /12/ have been verified by DNV on the project site during the onsite visit. DNV was able to confirm that a complete set of data for the monitoring period is available and the evidence for determining emission reductions have sufficient quality and are reliable.

3.6 Management System and Quality Assurance

The management system for the project is in place. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put in place. By interviewing with some staff, site visit and records check, DNV can confirm that the monitoring management system is implemented.

Monitoring and reporting of electricity generation is part of normal operations of Hebei Construction Investment New Energy Co., Ltd. The quality of meter readings is assured through calibration of electricity meters /14/ and through cross checking of readings between the meter and the receipts or invoices.

DNV has confirmed that the management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the VCU monitoring report.



4 CERTIFICATION AND VERIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification and certification of the emission reductions reported for the CDM project activity “Hebei Kangbao Sanxiatian Wind Farm Project” (UNFCCC Registration Reference. No. 3312) for the period from 1 December 2009 to 25 November 2010. As these emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions can not be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCUs) under the Voluntary Carbon Standard (VCS) 2007.1.

The verification was thus carried out in accordance with the requirement in the Voluntary Carbon Standard (VCS) 2007.1 applying to projects which are registered sequentially under the VCS Program and the CDM which is a VCS approved GHG program.

Hebei Construction Investment New Energy Co., Ltd. is responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD /2/, since the project design was previously assessed by Bureau Veritas Certification as part of the CDM validation and registration of the project /3/. DNV recognizes the validation opinion of Bureau Veritas Certification that the project design as documented is sound, reasonable and meets the relevant UNFCCC and host Party criteria. DNV also recognizes that the project was registered as a CDM project activity on 26 November 2010 under the UNFCCC reference number 3312.

DNV conducted the verification on the basis of the CDM monitoring methodologies ACM0002 – “Consolidated methodology for grid-connected electricity generation from renewable sources” (Version 10) /22/, the monitoring plan included in the PDD of the project /2/ and the VCU monitoring report of version 02 dated 22 August 2011 /1/. The verification included i) checking whether the provisions of the monitoring methodology ACM0002 (Version 10) /22/ and the monitoring plan in the PDD of version 02 dated 18 December 2009 /2/ were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV’s verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In DNV’s opinion, the GHG emissions reduction for the registered CDM project activity “Hebei Kangbao Sanxiatian Wind Farm Project” as reported in the VCU Monitoring Report of version 02 dated 22 August 2011 /1/ are fairly stated and the project design meets all VCU Verification Criteria.

The GHG emission reductions were correctly calculated on the basis of the approved CDM monitoring methodology of ACM0002 (Version 10) /22/ and the CDM monitoring plan contained in the validated CDM PDD /2/ for the project.



DNV Climate Change Services AS is able to certify that the VCU emission reductions from the “Hebei Kangbao Sanxiatian Wind Farm Project” during the period 1 December 2009 to 25 November 2010 amount to 143 980 tonnes of CO₂ equivalent.

DNV 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 DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

Beijing and Oslo, 23 August 2011

Gong Zheng
CDM verifier
DNV Beijing, China

Edwin Aalders
Approver
DNV Climate Change Services AS

* All Voluntary Carbon Units (VCU) are issued, held and cancelled in VCS registries. The VCS Association expects that multiple VCS registries will be available under the VCS and hopes to have registries approved under the VCS in the first half of 2008. Further information is available online (<http://www.v-c-s.org>)



5 REFERENCES

Category 1 Documents:

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the initial verification conclusions, and are usually further checked through interviews with key personnel.

- /1/ Hebei Construction Investment New Energy Co., Ltd.: *VCS Monitoring Report of Hebei Kangbao Sanxiatian Wind Farm Project*, version 01 of 17 June 2011 and version 02 of 22 August 2011.
- /2/ Easy Carbon Consultancy Co., Ltd.: registered PDD for Hebei Kangbao Sanxiatian Wind Farm Project, version 02 dated 18 December 2009.
- /3/ Bureau Veritas Certification: *Validation Report of the CDM project - Hebei Kangbao Sanxiatian Wind Farm Project*, report No: BVC/China-val/0194/2009, version 01 dated 21 January 2010.
- /4/ Easy Carbon Consultancy Co., Ltd.: *Emission Reductions Estimation Spreadsheet and EF calculation spreadsheet for CDM registered project of Hebei Kangbao Sanxiatian Wind Farm Project (ref. 3312)*.
- /5/ Easy Carbon Consultancy Co., Ltd.: *IRR spreadsheet for CDM registered project of Hebei Kangbao Sanxiatian Wind Farm Project (ref.3312)*.
- /6/ UNFCCC website: *CDM project information for Hebei Kangbao Sanxiatian Wind Farm Project (reference No. 3312)*. The project was registered on UNFCCC on 10 November 2010 with a renewable crediting period starting from 26 November 2010 to 25 November 2017.
<http://cdm.unfccc.int/Projects/DB/BVQI1264129691.43/view>
- /7/ UNFCCC website: *project information for Hebei Kangbao Wolongtushan 30 MW Wind Farm Project (reference No. 0878)*.
<http://cdm.unfccc.int/Projects/DB/DNV-CUK1169559890.44/view>
- /8/ Hebei Construction Investment New Energy Co., Ltd. & Zhanjiakou Power Supply Bureau (on behalf of NCPG): *Power Purchase Agreement for Hebei Kangbao Sanxiatian Wind Farm Project*, dated September 2009. The agreement is valid from 1 September 2009 to 31 December 2010.
- /9/ Hebei Construction Investment New Energy Co., Ltd.: *Emission Reduction Calculation Spreadsheet for VCS Hebei Kangbao Sanxiatian Wind Farm Project*, version 01 dated 25 April 2011.
- /10/ Hebei Construction Investment New Energy Co., Ltd.:
Original monitoring records on the electricity exported and the electricity imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010.
- /11/ Hebei Construction Investment New Energy Co., Ltd.:



- VCS Monthly monitoring reports on the electricity exported and the electricity imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010.
- /12/ Zhanjiakou Power Supply Bureau:
VCS Monthly electricity sales receipts for the electricity and the electricity imported of Hebei Kangbao Sanxiatian Wind Farm Project during the period of 1 December 2009 to 25 November 2010.
- /13/ Hebei Construction Investment New Energy Co., Ltd.:
CDM and Monitoring monthly training records of Hebei Kangbao Sanxiatian Wind Farm Project, from January 2010 to March 2011.
- /14/ Zhanjiakou Power Supply Bureau:
For main meter M1 of meter No. 09070111440058:
 - *The testing certificate of main meter M1*, dated 08 September 2009. This certificate indicated that the accuracy level 0.2S of meter M1 is eligible.
 - *The onsite calibration record of main meter M1*, dated 04 July 2010. This certificate indicated that the accuracy level 0.2S of meter M1 is eligible.
Quality and Technology Supervision Bureau of Hebei Province: *The Certificate of Metrological Authorization for Zhanjiakou Power Supply Bureau (certification No. JiFaji 2008 D011, valid to 17 February 2011)*, issued on 18 February 2008.
- /15/ Hebei Electric Construction Supervising Co., Ltd.: *The project construction permission for Hebei Kangbao Sanxiatian Wind Farm Project* indicates that the project will start to construction on 1 May 2009. The permission was signed on 30 April 2009.
- /16/ Zhanjiakou Power Supply Bureau:
The full operation connection acceptance for *Hebei Kangbao Sanxiatian Wind Farm Project* indicated the project commission on 28 November 2009, dated 21 December 2009.
- /17/ Hebei Construction Investment New Energy Co., Ltd.: The primary system diagram for *Hebei Kangbao Sanxiatian Wind Farm Project* and *Hebei Kangbao Wolongtushan 30 MW Wind Farm Project*.
- /18/ NDRC (DNA of China): *Letter of Approval (LoA) for Hebei Kangbao Sanxiatian Wind Farm Project*, dated July 2008.
- /19/ Hebei Construction Investment New Energy Co., Ltd.: *Declaration of the accreditation and transaction under the VCS during the monitoring period from 1 December 2009 to 25 November 2010 for Hebei Kangbao Sanxiatian Wind Farm Project*, dated 16 June 2011.
- /20/ Hebei Construction Investment New Energy Co., Ltd.: The wind speed recording by wind tower (No. 0054) at the project site. The wind tower is located at E 114°29'47.3" and N 41°50'57.6" and the wind speeding recording is from December 2006 to November 2011. The document is provided to DNV on 17 August 2011.



Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

- /21/ CDM Executive Board: Validation and Verification Manual, Version 1.2.
- /22/ CDM Executive Board: ACM0002 “Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources”, Version 10.
- /23/ ISAE3000 (Revised): Assurance Engagements other than Audits or Reviews of Historical Financial Information.
<http://www.ifac.org/IAASB/ProjectHistory.php?ProjID=0104>
- /24/ ISO/FDIS 14064-3 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions and employed a risk-based approach.
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38700
- /25/ Voluntary Carbon Standard – VCS 2007.1: *Voluntary Carbon Standard - Specification for the project-level quantification, monitoring and reporting as well as validation and verification of greenhouse gas emission reductions or removals.*
- /26/ Voluntary Carbon Standard – VCS 2007.1: *Program Guidelines*, dated 19 November 2007.
- /27/ Voluntary Carbon Standard – VCS 2007.1: *Policy Announcement from the VCS Association. Further Guidance for Projects that are Registered in Two GHG Programs*, dated 19 March 2008.
- /28/ State Economic and Trade Commission: *Technical administrative code of electric energy metering (DL/T 448-2000)*, dated 3 November 2000.
- /29/ Voluntary Carbon Standard: *Project Description Template*, dated 19 November 2007. Available at: <http://v-c-s.org/docs/VCS%20PD.doc>.
- /30/ Hebei Construction Investment New Energy Co., Ltd.: *Operation logs for turbines of Hebei Kangbao Sanxiatian Wind Farm Project*, from 1 December 2009 to 25 November 2010.
- /31/ Hebei Electric Power Design & Research Institute: *Feasibility Study report for Hebei Kangbao Sanxiatian Wind Farm Project*, dated September 2008.

Persons interviewed:

Persons interviewed during the initial verification, or persons contributed with other information that are not included in the documents listed above.

- /32/ Hebei Construction Investment New Energy Co., Ltd.
Mr. Zhang Wenhui, wind farm manager
Mr. Wang Tao, CDM project manager
Mr. Du Guang, CDM project manager
Mr. Wang Zhuang, CDM project manager

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APPENDIX A

CORRECTIVE ACTION REQUESTS CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	During the site visit, a back up line is found at the project site which is used for the emergency usage. The meter information which monitors electricity usage from the back up line should be clearly indicated in the monitoring report, like the meter location, accuracy, series number etc. DNV has checked the registered documents of the project downloaded from UNFCCC website. There is no information about this back up line and the meter for monitoring this back up line. The inconsistent for this situation and the registered PDD should be clarified.	If the 110kV main transmission is out of work, electricity needed would be imported via the backup line. As is shown in the primary system diagram, the electricity is firstly boosted its voltage to 35kV by station transformer and then delivered to low voltage side of main transformer of project 0878 via 35kV bus. After boosted its voltage, the electricity is transmitted to project 3312 via 110kV bus. On the other hand, if considering project 3312 as a black box, it is obvious that there is only one passageway between the grid and project 3312, that is, 110kV transmission line in which the monitoring meter of project 3312 is installed. Therefore, the electricity imported into project 3312 will be definitely recorded by the monitoring meter, no matter where the electricity sources from. Therefore, the monitoring plan of project 3312 is complete and rigorous though without information about the backup line and monitoring meter.	OK. DNV checked the primary system diagram for the proposed project during site visit /17/. It can confirm that the backup line is only connected to- and used for the project “Hebei Kangbao Wolongtushan 30 MW Wind Farm Project” (ref. No. 0878). This can be reflected from revised PDD for “Hebei Kangbao Wolongtushan 30 MW Wind Farm Project” (ref. No. 0878) /7/. All the import electricity and export electricity for the proposed project is monitored by meter M1. DNV can confirm that there is no need to consider the back up line which was investigated during site visit. The emission reduction related to backup line is eliminated from the emission reduction calculation which is reflected on the updated ER calculation spreadsheet /9/. CAR 1 is closed.

		The VCS MR has been revised in accordance with the monitoring plan specified in the registered CDM-PDD.	
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Clarification requests

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	DNV has checked the registered documents of the project downloaded from UNFCCC website. The registered validation report is version 01 dated 21 January 2010. However, the date of the CDM validation report is stated as 8 January 2010 in the provided monitoring report. Further clarification is sought on this difference.	The issuance date of registered validation report has been corrected in the revised monitoring report.	OK. The correct validation report date (21 January 2010) is updated in the revised monitoring report. CL 1 is closed.
CL 2	The sales receipts were checked during site visit. It is found that the import and export electricity are recorded on the last day of each month. So the data source for the electricity reading for both import and export on 25 November 2010 needs to be clarified.	In line with the registered Monitoring Plan, the import and export electricity are measured continuously by the monitoring meter. And the meter readings at 24:00 on 25th November 2010 were recorded in Daily Production Report.	OK. The monthly reading time of main meter M1 is at 24:00 on the last day of every month according to the PPA /8/. The project started to generate electricity on 28 November 2009 when the first wind turbine was put into operation /16/, and by the end of December 2009, all the 33 wind turbines were put into operation /16/. The meter readings for meter M1 at 00:00 on 24 November 2010 and at 24:00 on 25 November 2010 were confirmed by the grid company /10/. The input data from 24 November 2010 and at 24:00 on 25 November 2010 in the ER calculation spreadsheet /9/ were cross-checked

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
			by DNV with the electricity sales receipts of November 2010 /12/ and found to be consistent. CL 2 is closed.
CL 3	DNV has checked the registered documents of the project downloaded from UNFCCC website. In the registered PDD and validation report, the estimated emission reduction for this proposed project is 123 136 tCO ₂ e in the monitoring period. However, the actual emission reductions for the proposed project is 143 980 tCO ₂ e which is higher than the estimated emission reductions in the registered PDD, further clarification is sought on this increment.	Clarification is specified in the revised MR and relevant evidences have been provided to verifier.	OK. The higher value is justified as follows: The electricity increases due to many reasons at the real practise: higher speed resource; better turbine efficiency; lower down time/good maintenance on equipments etc. All these could have attributed to the higher generation of electricity. According to the FSR /31/, 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. The average annual wind speed of this monitoring period is higher than the one of Representative Year. The wind speed monitored on site for the period December 2006 to November 2010 was further checked by DNV /20/, the wind speed reaches the highest value in the year 2009 (with a monitoring wind speed period December 2008 to November 2009) /20/. From the recorded data, DNV can conclude that the wind speed is fluctant in the period December 2006 to

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
			November 2010. Therefore, it is reasonable to attribute the increase of electricity generation to the wind energy fluctuation. DNV is able to confirm that the PLF from 1 December 2009 to 25 November 2010 of the project is reasonable. And the actual emission reductions during the monitoring period of 1 December 2009 to 25 November 2010 (360 days) is 143 980 tCO_{2e} /1/. CL 3 is closed.

Forward action requests from previous verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR 1	N/A	N/A	N/A

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APPENDIX B

CLARIFICATION OF CLAUSES 1.12, 1.13, 1.14, 8.1 AND 8.2 OF THE VCS 2007.1

1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS 2007.1

The project has been undergoing the validation and verification for the 1st monitoring period (1 December 2009 to 25 November 2010) under the VCS 2007.1 by an accredited validator and verifier (DNV). This clarification is annexed to cover all the requirements set out in the VCS2007.1 for project validation together with the validated PDD (version 02 dated 18 December 2009), according to the Policy Announcement from the VCS Association /29/.

Clarification of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS 2007.1 are as follows:

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Validation by DNV: As a wind energy project, the project will produce clean electricity using wind power resources and will generate GHG emission reductions by avoiding CO₂ emissions from electricity generation of fossil fuel fired power plants. Operation of this project does not lead to GHG emissions. It is confirmed that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

Validation by DNV: The project is located in China and is developed and operated by Hebei Construction Investment New Energy Co., Ltd., which has been validated by DNV via the site visit, check and acceptance report of the completed construction for Hebei Kangbao Sanxiatian Wind Farm Project /16/ and PPA /8/. It has been verified by DNV that there is no mandatory program defined for renewable energy in China, and there are no carbon trading scheme in China. Thus, it can be confirmed that there is no other environmental credit which has or will be produced by or obtained for the project /19/.

1.14 Project rejected under other GHG programs (if applicable):

Validation by DNV: The project has been registered as a CDM project and it doesn't fall into rejected projects under other GHG programs.

8.1 Proof of Title:

Validation by DNV: The project's design and implementation have been verified in compliance with all relevant and national legislations in China /8/ /15/ /16/. The declaration letter from the project owner /19/ has been obtained. It has been confirmed that the project owner will not apply for other VERs (VER+, GS etc.) and that all credits are transferred to the buyer, which is still pending. It also has been confirmed that the Hebei Construction Investment New Energy Co., Ltd. will only sell the VCUs once /19/.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

Validation by DNV: The project is not included in an emissions trading program, and does not take place in a jurisdiction or sector in which binding limits are established on GHG

emissions. The project does not reduce GHG emissions from activities that participate in an emissions trading program, so this clause is not applicable.



Amendment Statement

DNV Climate Change Services AS (DNV) has performed the verification of emission reductions reported for the project activity “Hebei Kangbao Sanxiatian Wind Farm Project” in China, managed by Hebei Construction Investment New Energy Co., Ltd. for the period from 1 December 2009 to 25 November 2010 (Report No. 2011-9482, report version 01 dated 23 August 2011). This verification is performed under Voluntary Carbon Standard (VCS) 2007.1. In this VCU (Voluntary Carbon Units) verification report, DNV can confirm that the total emission reductions for the period from 1 December 2009 to 25 November 2010 is 143 980 tonnes of CO₂ equivalent. The breakdown of this total emission reductions is listed as follows:

Item	Data	Unit
Emission emissions from 1 December 2009 to 31 December 2009	15,093	tCO ₂ e
Emission emissions from 1 January 2010 to 25 November 2010	128 887	tCO ₂ e

DNV Climate Change Services AS is able to certify that the VCU emission reductions from the “Hebei Kangbao Sanxiatian Wind Farm Project” during the period 1 December 2009 to 31 December 2009 amount to 15 093 tonnes of CO₂ equivalent and 1 January 2010 to 25 November 2010 amount to 128 887 tonnes of CO₂ equivalent with total 143 980 tonnes of CO₂ equivalent.

Edwin Aalders
Approver
DNV Climate Change Services AS
Date: 03 October 2011