# VERIFICATION REPORT
# THE KANSAI ELECTRIC POWER CO.,INC.

## VERIFICATION OF THE
## SHANDONG HUANENG SHOUGUANG 49.5MW WIND FARM PROJECT

REPORT NO.BVC/CHINA-VR/8176/2011

REVISION NO.01

BUREAU VERITAS CERTIFICATION

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# VERIFICATION REPORT

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|---|---|
| Date of first issue:<br>15/04/2011 | Organizational unit:<br>Bureau Veritas Certification Holding SAS |
| Client:<br>The Kansai Electric Power Co., Inc. | Client ref.:<br>Mr. Naoyoshi Kadono |


Summary:

Bureau Veritas Certification has conducted the 1st periodic verification of Shandong Huaneng Shouguang 49.5MW Wind Farm Project, CDM Registration Reference Number 3391, owned by Huaneng Shouguang Wind Power Co., Ltd, which is located in Shouguang County, Weifang City, Shandong Province, P.R.China, and applying the methodology ACM0002 version 09, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CLs, CARs and FARs), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the emission reductions verified totalize 49,708 tons of $CO_2e$ for the monitoring period.

Our opinion relates to the Projects' GHG emission and resulting GHG emission reductions reported are based on the valid and registered project baseline, monitoring plan and its associated documents.

| | | |
|---|---|---|
| Reporting period | : | 19/07/2010 to 24/12/2010 |
| Baseline emissions | : | 49,708t $CO_2$ equivalents. |
| Project emissions | : | 0 t $CO_2$ equivalents. |
| Leakage emissions | : | 0 t $CO_2$ equivalents. |
| Emission Reductions | : | 49,708 t $CO_2$ equivalents. |


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|---|---|---|
| Report No.:<br>BVC/China-VR/8176/2011 | Subject Group:<br>CDM | |
| Project title:<br>Shandong Huaneng Shouguang 49.5MW Wind Farm Project | | |
| Work carried out by:<br>Tim Wang Wei - Team leader<br>Zhang Chen - Team Member (trainee) | | |
| Internal Technical Review carried out by:<br>Li Yiting | | |
| Date of this revision:<br>22/04/2011 | Rev. No.:<br>01 | Number of pages:<br>32 |

**Indexing terms**

Work approved by:

Flavio Gomes

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## Abbreviations

| | |
|---|---|
| BVC | Bureau Veritas Certification |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CER | Certified Emission Reductions |
| CL | Clarification Request |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide Equivalent |
| DOE | Designated Operational Entity |
| DRR | Daily Reading Record |
| FAR | Forward Action Request |
| FSR | Feasibility Study Report |
| GHG | Green House Gas(es) |
| MoV | Means of Verification |
| MP | Monitoring Plan |
| MR | Monitoring Report |
| MRR | Monthly Reading Record |
| NCPG | North China Power Grid |
| PDD | Project Design Document |
| PLF | Plant Load Factor |
| PP | Project Participant |
| PPA | Power Purchase Agreement |
| TGL | Turbine Generation Log |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VVM | Validation and Verification Manual |
| WTG | Wind Turbine Generator |

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# 1 INTRODUCTION

The Kansai Electric Power Co., Inc. has commissioned Bureau Veritas Certification (hereafter called "**BVC**") to verify the emission reductions of its CDM project Shandong Huaneng Shouguang 49.5MW Wind Farm Project (hereafter called "**the Project**") owned by Huaneng Shouguang Wind Power Co., Ltd. (the project owner, hereafter called "**the PP**") at Shouguang County, Weifang City, Shandong Province, P.R.China.

This report summarizes the findings of the verification of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

## 1.1 Objective

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures.

Based on the applicable requirements of paragraph 62 of the CDM modalities and procedures, this assessment shall:

a) Ensure that the project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;

b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs and verifiable and in accordance with applicable CDM requirements;

c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;

d) Evaluate the data recorded and stored as per the monitoring methodology.

## 1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

## 1.3 GHG Project Description

The Project consists of 33 sets of wind turbine generators (WTGs) with a unit installed capacity of 1.5MW, providing a total installed capacity of 49.5MW. The annual expected electricity supplied to North China Power Grid (NCPG) is 96,478.8MWh and the annual estimated emission reductions are 101,765t$CO_2$e.

The Project has been registered on 19/07/2010 (UNFCCC ref. No. 3391) under approved CDM methodology ACM0002 Version 09 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The renewable crediting period is from 19/07/2010 to 18/07/2017.

(http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1265792990.64/view)

## 1.4 Verification Team and internal Technical Reviewer

The verification team consists of the following personnel:

| FUNCTION | NAME | CODE HOLDER* | TASK PERFORMED |
|---|---|---|---|
| **Team Leader** | Mr. Tim Wang Wei. | ☒**Yes** ☐ **No** | ☒**DR** ☒**SV** ☒**RI** |
| **Team Member** | Ms. Zhang Chen (Trainee) | ☐**Yes** ☒ **No** | ☒**DR** ☐**SV** ☐**RI** |
| **Technical Specialist** | N.A. | ☐**Yes** ☐ **No** | ☐**DR** ☐**SV** ☐**RI** |
| **Internal Technical Reviewer (ITR)** | Ms. Li Yiting | ☒**Yes** ☐ **No** | ☐**DR** ☐**SV** ☐**RI** |
| **Specialist supporting ITR** | N.A. | ☐**Yes** ☐ **No** | ☐**DR** ☐**SV** ☐**RI** |

*DR = Document Review; SV = Site Visit; RI = Report issuance;

# 2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual /6/, issued by CDM Executive Board at its 55$^{th}$ meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

## 2.1 Review of Documents

The Monitoring Report (MR) submitted by Beijing Changjiang River International Holding (the consultant) and additional background documents related to the project design and baseline, i.e. country Law, the registered Project Design Document (PDD), approved methodology ACM0002 Version 09 /5/，and Kyoto Protocol.

The following documents were used as references to the verification work, in addition to internal BVC procedures: Validation and Verification Manual Version 01.2 (EB 55 Annex 01);ISO 14064-3-Greenhouse gases –Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions; ISO 14064-2-Greenhouse gases – Part 2:Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.

The verification conclusions presented in this report relate to the project as described in the registered PDD version 04 /1/ dated 08/01/2010 and Monitoring Report (MR) version 02 /4/ of this monitoring period dated 14/04/2011.

## 2.2 Follow-up Interviews

On 16/03/2011, BVC performed an on-site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Huaneng Shouguang Wind Power Co., Ltd. and Beijing Changjiang River International Holding were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

| Interviewed organization | Interview topics |
|---|---|
| Huaneng Shouguang Wind Power Co., Ltd. (the PP) | ➢ Project Design and implementation<br>➢ Technical equipment, calibration and operation<br>➢ Monitoring Plan and management procedures<br>➢ Monitoring data<br>➢ Data uncertainty and residual risks (QA/QC)<br>➢ GHG Calculation<br>➢ Environmental Impacts<br>➢ Compliance with National Laws and Regulations |
| Beijing Changjiang River International Holding (the consultant) | ➢ Monitoring Plan<br>➢ Monitored data and Monitoring Report<br>➢ GHG Calculations |

## 2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, where:

a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;

c) Issues identified in a FAR during validation or previous verification to be verified during verification have not been resolved by the project participants.

Forward Action Requests (FARs) are issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

BVC may also use the term Clarification Requests (CLs), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

## 2.4 Internal Quality Control

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the project activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

- The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The reviewer compiles clarification questions for the Team Leader and Verification Team and discusses these matters with Team Leader.

After the agreement of the responses on the 'Clarification Request' from the Team Leader as well as the PP(s) the finalized verification report is accepted for further processing such as uploading on the UNFCCC webpage

# 3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in **1** Corrective Action Request and **4** Clarification Requests.

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been re-assessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVM paragraph.

## 3.1 Project implementation in accordance with the registered project design document (VVM198)

BVC has performed an on-site visit and found that the Project has been put into operation and the electricity generated is supplied to NCPG according to the signed Power Purchase Agreement (PPA)./9/ 33 sets of WTGs with a unit capacity of 1.5MW as described in the registered PDD have been in operation during the monitoring period. The WTGs used in the Project are a kind of IEC3 type one according to the provided WTG specification/17/, which are fully consistent with the registered PDD/1/. According to the Implementation/operation log/16/ of the Project started commissioning on 16/12/2008 and the implementation is not phased.

[Power System]

As shown in the diagram of the power system connection/8/, the electricity generated by the Project is delivered to the gateway substation (Fengtai substation) through a 110kV line and then delivered to SGPG and then to ECPG.

[Metering System]

There are two meters installed for the Project./8//9/

The main meter (M1) was installed at the output side of the switching substation to measure the electricity suppled to and purchased from SGPG within NCPG by the Project.
The check meter (M2) was installed at the project site to check the record data of the main meter. This check meter is owned, operated and maintained by the project owner.

[Management and Operation]

The PP has operated the Project as per the registered PDD. The monitoring organization has been set up and all monitoring staffs have been trained./14/ Manual records of both meters are based on continuous measurement and monthly recorded by the PP. The grid company issues the sale receipts to the PP every month to confirm the electricity exported to and imported from the grid. Internal CDM QA/QC procedures/15/ and CDM monitoring internal training records/14/ have been provided and verified by BVC.

✌ Corresponding to the paragraph 198 of VVM version 01.2, BVC can confirm that:

- The implementation of the Project is consistent with the registered PDD.
- The Project is operated as per the registered PDD by the PP.
- Information provided in the MR is in accordance with that stated in the registered PDD.

## 3.2 Compliance of the monitoring plan with the monitoring methodology (VVM203)

✌ Corresponding to the paragraph 203 of VVM version 01.2, BVC has verified the validated monitoring plan, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the registered PDD, and is able to confirm that the monitoring plan is in accordance with the approved methodology applied by the Project.

## 3.3 Compliance of monitoring with the monitoring plan (VVM206)

The parameters required by the monitoring plan and the way the Verification Team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values in the monitoring reports are described below:

[Consistency between monitoring and the monitoring plan]

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD. /1/

The parameters required by the monitoring plan and the way BVC has verified the values in the monitoring reports are described below:

$EG_{out,y}$: on-grid electricity supplied to NCPG by the Project.

$EG_{in,y:}$ on-grid electricity purchased from NCPG by the Project for the plant operation.

The above parameters are both measured by Meters M1 and M2.

[Calibration]

Both the meters were calibrated by Weifang Power Company Meter Measuring Centre, whose authorized certificate is Lu Fa Ji(2009)No.D008/13/ with the valid period from 01/01/2009 to 31/12/2011 The calibration records/12/ are shown in Table 2 below.

Table 2 The calibration records of the meters

| Meter | SN | Accuracy Class | Calibration date | Validity | Frequency |
|---|---|---|---|---|---|
| M1 | 20070808020043 | 0.5S | 07/06/2010 | 06/06/2011 | Annually |
| M2 | 09100170220042 | 0.5S | 07/06/2010 | 06/06/2011 | Annually |

BVC has verified the calibration certificates issued by the calibrators and accreditation certificates of the calibrators. Both the meters are within suitable accuracy level and consistent with the registered PDD. The valid period of the calibration certificates/12/ can cover the monitoring period and valid period of the accreditation certificates/13/ can cover the date of the calibration.

[Information flow]

As described above, the two meters have been installed in accordance with the registered PDD./1/ BVC has on-site checked the location of the meters against the diagram of power connection system/8/ of the Project and found that they are consistent.

The readings of Meter M1 are based on continuous measurement and monthly frozen on monthly basis by the grid company. The cut-off time is 24:00 in the cut-off date in each month. The cut-off date is determined by the grid company and informed to the PP before it. The different cut-off dates in each month have no impact on the emission reductions claimed for the monitoring period. The sale receipts/11/ are issued by the grid company and sent to the PP every month. During the same period, the reading records of Meter M1 is based on continuous measurement and monthly recorded and the readings records of Meter M2 is also based on continuous measurement and daily/monthly recorded by the PP./10/ The cut-off time of the monthly reading records are the same as the one of the sale receipts.

The emission reductions from 19/07/2010 to 22/07/2010 are not claimed for the monitoring period for there is only electricity sales receipt for the whole July and without the relevant receipt for the period from 19/07/2010 to 22/07/2010. The reading records of M1 cannot cover the period from 19/07/2010 to 22/07/2010 too for the readings of M1 are only monthly recorded. The reading records of M2 can cover the monitoring period from 19/07/2010 to 24/10/2010. BVC has on-site checked the implementation/operation log of the Project and confirms that the Project was in normal operation during the period from 19/07/2010 to 22/07/2010. Thus it is conservative that the emission reductions from 19/07/2010 to 22/07/2010 were considered as 0.

The net electricity supplied to the grid by the Project ($EG_y$) is the electricity exported to the grid minus the electricity imported from the grid by the Project. Therefore $EG_y$ is calculated as below:

$EG_y = EG_{out,y} - EG_{in,y}$

BVC has verified the values provided in the monitoring report against the relevant documented evidences i.e. the reading records and the sale receipts and found it consistent with the evidences. BVC has crosschecked the reading records of M1 with the reading records of M2 and found that the value from reading records of M1 is a smaller than the reading records of

Meter M2, which is due to the line loss from M2 to M1 and considered reasonable. BVC has also cross-checked the reading records of M1 with sale receipts and found that they were consistent except Dec.2010. The readings of MRR and receipts are not fully identical in Dec.2010 because meters are not read and recorded by PP and grid company simultaneously. The minor difference is deemed reasonable. And the conservative value is used to calculate emission reductions.

According to the methodology ACM0002 ver.09, there are no other external data required for determining the emission reductions of the Project as the emission factor of the Project has been determined ex-ante in the registered PDD and fixed for the first crediting period. The emission factor used in the monitoring report has been verified against the PDD and found same.

The calibration and maintenance procedures are in compliance as described in the registered PDD. The calibration of the meters has been provided and verified during the verification.

✌ Corresponding to the paragraph 206 of VVM version 01.2, BVC can confirm that:

- The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.
- All parameters stated in the monitoring plan of the registered PDD have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified and found complete and consistent by checking the whole procedure for information aggregation.

## 3.4 Assessment of data and calculation of greenhouse gas emission reductions (VVM209)

A complete set of data of reading records of M2 for this monitoring period is available from 19/07/2010 to 24/12/2010. As there was no electricity sales receipt and reading records of M1 from 19/07/2010 to 22/07/2010 for crosscheck, the emission reductions from 19/07/2010 to 22/07/2010 are not claimed for the monitoring period, which is considered conservative as described before.

The critical parameter used for the determination of the Emission Reductions is the net electricity supplied to the grid by the Project. The data pertaining to the above parameter is maintained in the identified records. All the data are in compliance with that stated in the Monitoring Report version 02.

As per the methodology ACM0002 version 09 and the registered PDD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$ER_y = BE_y – PE_y – L_y$

Where,

$ER_y$: Emission reductions

$BE_y$: Baseline emissions

$PE_y$: Project emissions

$L_y$: Emissions due to leakage

The baseline emissions are the baseline emission factor times the net electricity supplied to the grid. Therefore,

$BE_y = EF_y \times EG_y$

$EF_y$: GHG emission factor of the North China Power Grid (NCPG), calculated ex ante in the registered PDD as 1.0548 $tCO_2e/MWh$

$EG_y$: Net electricity supplied to the grid

BVC has checked the electricity supplied to and purchased from the grid in the MR version 02 against the reading records and the sale receipts issued by the grid company from 23/07/2010 to 24/12/2010. BVC can confirm that the conservative values have been used for determining emission reductions. The verified values are shown in the following Table 3 and 4.

Table 3 The verified electricity exported to the grid by the Project (MWh)

| Period | Reading records of M1 | Sale receipts | Reading records of M2 | Verified $EG_{out,y}$ |
|---|---|---|---|---|
| 19/07/2010-22/07/2010 | - | - | 1011.12* | 0 |
| 23/07/2010-22/08/2010 | 7,478.24 | 7,478.24 | 7,539.84 | 7,478.24 |
| 23/08/2010-25/09/2010 | 5,422.56 | 5,422.56 | 5,584.48 | 5,422.56 |
| 26/09/2010-26/10/2010 | 9,065.76 | 9,065.76 | 9,160.80 | 9,065.76 |
| 27/10/2010-25/11/2010 | 9,903.52 | 9,903.52 | 10,018.80 | 9,903.52 |
| 26/11/2010-24/12/2010 | 15,408.88 | 15,408.80 | 15,502.96 | 15,408.80 |
| Total | | | | 47,278.88 |

Table 4 The verified electricity imported from the grid by the Project (MWh)

| Period | Reading records of M1 | Sale receipts | Reading records of M2 | Verified $EG_{im}$ |
|---|---|---|---|---|
| 19/07/2010-22/07/2010 | - | - | 0 | 0 |
| 23/07/2010-22/08/2010 | 26.40 | 26.40 | 25.52 | 26.40 |
| 23/08/2010-25/09/2010 | 52.80 | 52.80 | 51.92 | 52.80 |
| 26/09/2010-26/10/2010 | 24.60 | 24.60 | 23.76 | 24.60 |

* As there was no electricity sales receipt and reading records of M1 from 19/07/2010 to 22/07/2010 for crosscheck, the emission reductions from 19/07/2010 to 22/07/2010 are not claimed for the monitoring period

| | | | | |
|---|---|---|---|---|
| 27/10/2010-25/11/2010 | 28.20 | 28.20 | 27.28 | 28.20 |
| 26/11/2010-24/12/2010 | 21.12 | 21.12 | 20.24 | 21.12 |
| Total | | | | **153.12** |

The net electricity supplied to the grid in this monitoring period is:

$EG_y$=47,278.88MWh – 153.12MWh = 47,125.76 MWh

The baseline emissions of the Project are:

$BE_y=EF_y \times EG_y$=1.0548 $tCO_2e$/MWh × 47,125.76MWh =49,708 $tCO_2e$

The Project is a newly built wind power project, thus the project emissions are zero according to ACM0002 version09.

No leakage needs to be considered according to ACM002 version09.

Therefore, the emission reductions during the monitoring period from 19/07/2010 to 24/12/2010 are calculated as:

$ER_y = BE_y-PE_y-L_y$=49,708 $tCO_2e$ – 0 – 0=49,708 $tCO_2e$

[Comparison of the emission reduction with the PDD]

The annual estimated emission reductions are 101,765 $tCO_2e$ as per the registered PDD./1/ This monitoring period from 19/07/2010 to 24/12/2010 covers 159 days. The estimated emission reductions in the monitoring period are 44,330 (=101,765*159/365) $tCO_2e$. The actual emission reductions in the monitoring period are 12% higher than the estimated value for the same period in the PDD.

BVC assessed one whole year's electricity generated by the Project from 25/12/2009 to 24/12/2010. The actual net electricity supplied to the grid in one year is 118,836.96MWh/11/, and one year's emission reductions from 25/12/2009 to 24/12/2010 will are 125,349 $tCO_2$, which is 23.18% higher than the estimated value in PDD.

Referring to "2010 year Wind Speed in Shouguang City" provided by Shouguang Weather Station/19/ and historical average wind speed during the period from 1988 to 2006 in the FSR//20, the average wind speed during the assessed one year period is 3.05m/s, while historical average wind speed is only 2.79m/s based on which the Project's annual electricity generation is estimated. Therefore it can be concluded the year in the monitoring period is a strong-wind year and such high wind speed has also happened in 1997. Thus the increase of electricity generation is outcome of strong wind over the year and is beyond the control of PP.

Based on the fact that electricity generated by the Project is dependent on wind power density which is theoretically proportional to the cube of wind speed, actual electricity generation could be 30.64%[†] higher. Hence the actual increase of electricity by 23.18% falls within the range of 30.64% analyzed above. From the above analysis the increase of emission reductions is deemed reasonable.

✌ Corresponding to the paragraph 209 of VVM version 01.2, BVC can confirm that:

- The data used for the determination of the emission reductions are available and monitored in accordance with the registered monitoring plan.

[†] Applying the wind desity $E=PV^3/2$, the increase is calculated as $(3.05^3-2.79^3)/2.79^3$=30.64%

- The data used in anthropogenic emission reductions' calculation of this monitoring period have been verified and found consistent with those prescribed in the registered PDD.
- The appropriate methods and formulae for calculating baseline emissions, project emissions and leakages has been properly followed the methodology and registered PDD;
- The assumptions, emission factors and default values that were applied in the monitoring report and the calculations have been justified.

# 4 VERIFICATION OPINION

Bureau Veritas Certification (BVC) has performed the 1st periodic verification of Shandong Huaneng Shouguang 49.5MW Wind Farm Project, which applies the methodology ACM0002 version 09. The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on site visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Huaneng Shouguang Wind Power Co., Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan in the registered PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the Project, is the responsibility of the management of the Project.

BVC has verified the project Monitoring Report version 02 for the reporting period as indicated below. BVC confirms that the Project is implemented and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions as a CDM project.

BVC can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the projects' GHG emission and resulting GHG emission reductions reported are based on the validated and registered project baseline, monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, BVC confirms the following statement:

| | | | |
|---|---|---|---|
| Reporting period | : | 19/07/2010 to 24/12/2010 | |
| Baseline emissions | : | 49,708 | t $CO_2$ equivalents |
| Project emissions | : | 0 | t $CO_2$ equivalents |
| Leakage emissions | : | 0 | t $CO_2$ equivalents |
| Emission Reductions | : | 49,708 | t $CO_2$ equivalents |

Li Yiting
Internal Technical Reviewer
22/04/2011

Tim Wang Wei
Team Leader
22/04/2011

# 5 REFERENCES

/1/ Registered PDD version 04 dated 08/01/2010, CDM ref no.3391
/2/ Validation Report revision 01.4, dated 10/02/2010
/3/ Monitoring Report version 01, dated 14/02/2011
/4/ Monitoring Report Version 02, dated 14/04/2011
/5/ ACM0002 version 09 dated 13/02/2009
/6/ Validation and Verification Manual Version 01.2 dated 30/07/2010
/7/ Emission reductions calculation spreadsheet
/8/ Diagram of power system connection of the Project
/9/ Power Purchase Agreement (PPA) signed between the PP and local grid company
/10/ Monthly Reading Records (MRR) of the meters
/11/ Sale receipts issued by the grid company
/12/ Calibration Certificates of the meters
/13/ Certificate of metrological authorization to Weifang Power Company Meter Measuring Centre(Code:Lu Fa Ji(2009)No.D008) with the valid period from 01/01/2009 to 31/12/2011
/14/ CDM and monitoring internal Training records
/15/ Internal CDM QA/QC Procedures
/16/ Implementation/operation log of the Project
/17/ WTG specification
/18/ Operation log of the Project
/19/ 2010 year Wind Speed in Shouguang City provided by Shouguang Weather Station
/20/ Historical average wind speed during the period from 1988 to 2006 in the FSR

**Persons interviewed:**

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

| | | |
|---|---|---|
| /1/ | Mr.Naoyoshi Kadono, | CDM manager of Kansai Electric Inc. |
| /2/ | Mr.Hiroyuki Okano, | Personnel of Kansai Electric Inc. |
| /3/ | Ms.Zhu Qiyan, | Project manager of the PP |
| /4/ | Mr.Zhu Jiapeng, | Master of the Plant |
| /5/ | Ms.Tu Li, | Consultant |
| /6/ | Ms.Zhang Ping | Consultant |
| /7/ | Mr.Ye Shengpeng, | Operation manager of the Plant |

# 6 CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

| | | |
|---|---|---|
| Mr.Tim Wang Wei | Bureau Veritas Certification, China | Team leader, Climate Change Lead Verifier,<br>He holds a Master Degree in Environmental Science. Before joining BV in Feb.2009, he gained 4 and a half years of working experience in engineering and EIA for manufacturing enterprise in P.R. China. He obtained the certificates of CDM Lead Verifier and ISO14001 Lead Auditor in Bureau Veritas and received training in ISO 14064. |

| | | |
|---|---|---|
| Ms. Zhang Chen | Bureau Veritas Certification, China | Team Member, Climate Change Verifier(trainee)<br>She holds Master Degree in Environmental Economics and Environmental Engineering. Before joining BV in 2010, she has gained experiences in project financing evaluation, policy cost-benefit analysis and environmental management. She obtained the certificate of GHG Auditor and ISO 14001 Lead Auditor, and received training in ISO 14064. |

| | | |
|---|---|---|
| Ms. Li Yiting | Bureau Veritas Certification, China | Technical Reviewer Climate Change Lead Verifier.<br>She holds a Master Degree in Environmental Science. Before joining BV in 2009, she gained two and a half years of CDM technical working experience in P.R China. She obtained the certificate of CDM Lead Verifier, Lead Auditor for ISO 14001 and ISO 14064. |

# APPENDIX A: COMPANY CDM PROJECT VERIFICATION PROTOCOL

**Table 1 Verification requirements based on the Validation and Verification Manual (Version 01.2, EB55 Annex 1)**

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| ***1. Remaining Issues*** | | | | | |
| *a.* Have all issues identified in the validation report to be verified during verification been resolved by the project participant and are there any open issues identified in the previous verification? | VVM EB48 | 190 Ann 68 | Yes.<br>This is the 1st periodic verification. No FAR was raised in the validation stage. | OK | OK |
| ***2. Project implementation in accordance with the registered project design document*** | | | | | |
| a. Are all physical features of the proposed CDM project activity proposed in the registered PDD in place? | VVM | 196 | Yes.<br>All facilities and equipments including 33 sets of WTGs with a total capacity of 49.5MW are in place and in generation during the monitoring period. Unit capacity of each WTG is 1.5MW. The WTGs used in the Project are a kind of IEC3 type one according to the provided specification, which are fully consistent with the registered PDD. | OK | OK |
| b. Have the project participants operated the proposed CDM project activity as per the registered PDD? | VVM | 196 | Yes.<br>The Project is operated by Huaneng Shouguang Wind Power Co., Ltd (the PP). The PP has operated the CDM project activity as per the registered PDD. The electricity generated | OK | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| | | | has been delivered properly to the grid as per the PPA signed with the grid company. | | |
| c. Was an on-site visit conducted? | VVM | 196 | Yes.<br>The on-site visit of 1st periodic verification has been conducted on 16/03/2011.<br>Tim Wang Wei, Climate Change verifier of BVC China<br>The audit purpose and methodology were briefed in the opening meeting participated by the following persons.<br>Mr.Naoyoshi Kadono, CDM manager of Kansai Electric Inc.<br>Mr.Hiroyuki Okano, Personnel of Kansai Electric Inc.<br>Ms.Zhu Qiyan, Project manager of the PP<br>Mr.Zhu Jiapeng, Master of the Plant<br>Ms.Tu Li, Consultant<br>Ms.Zhang Ping Consultant<br>Mr.Ye Shengpeng, Operation manager of the Plant | OK | OK |
| d. If not, justify the rationale of the decision. | VVM | 196 | N.A. | OK | OK |
| e. Is it identified that the implementation or operation of CDM project activity does not conform with the description contained in the registered PDD, are following | VVM | 197 | No. | OK | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| conducted? | | | | | |
| i. If yes, has an assessment been conducted on the potential impacts due to these changes following EB 48 report, paragraph 73 and its annex 67? | VVM | 197 | N.A. | OK | OK |
| ii. If yes, has a notification or a request for approval of changes been submitted from the project activity as described in the registered PDD prior to the conclusion of the verification/certification for the corresponding monitoring period based on the assessment above? | VVM | 197 | N.A. | OK | OK |
| ***3. Compliance of the monitoring plan with the monitoring methodology*** | | | | | |
| a. Is the validated monitoring plan in accordance with the approved methodology applied by the proposed CDM project activity? | VVM | 200 | Yes.<br>The registered Monitoring Plan (MP) in accordance with the methodology ACM0002 version 09 has been applied by the CDM project activity. | OK | OK |
| b. If no, was a request for revision of the monitoring plan was done? (The DOE may request for revision of the | VVM | 201 | N.A. | OK | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| monitoring plan covering the monitoring period under verification, for approval by CDM Executive Board) | | | | | |
| c. Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale methodologies(e.g. additional monitoring parameters, monitoring frequence and calibration frequence)? | VVM | 202 | No. | OK | OK |
| ***4. Compliance of monitoring with the monitoring plan*** | | | | | |
| a. Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants? | VVM | 205 | Yes.<br>The MP and the metholodgy ACM0002 version 09 have been followed by the PP. | OK | OK |
| b. Have all parameters stated in the monitoring plan, the applied methodology and relevant CDM Executive Board decisions been sufficiently monitored and updated as applicable, including: | VVM | 205 | | | |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| i. Project emission parameters? | VVM | 205 | Yes.<br>The Project is a new built wind power project, thus the project emissions of the project are zero according to the ACM0002 version 09. | OK | OK |
| ii. Baseline emission parameters? | VVM | 205 | Yes.<br>The net electricity delivered to the grid by the Project ($EG_y$) is used for baseline emission calculation.<br>$EG_y=EG_{out,y}-EG_{in,y}$<br>$EG_{out,y}$, On-grid electricity supplied to NCPG by the Project.<br>$EG_{in,y}$, On-grid electricity purchased from NCPG by the Project for the plant operation.<br>The parameters $EG_{out,y}$ and $EG_{in,y}$ are monitored by the bidirectional meters M1 and M2. | OK | OK |
| iii. Leakage parameters? | VVM | 205 | Yes.<br>According to the registered PDD and the methodology ACM0002 version 09, not leakage needs to be considered. | OK | OK |
| iv. Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan? | VVM | 205 | Yes.<br>The PP has the responsibility of overall monitoring, which has established a monitoring team for monitoring of power generation, maintenance and operation of the CDM Project activity. All the records related to generation and maintenance have been satisfactorily maintained.<br>Responsibilities have been allocated to the well-trained | OK | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| | | | monitoring staff as per registered Monitoring Plan.<br>The QA / QC procedures are part of management system and are documented in management procedures.<br>The records and all relevant paper based information are collected and archived by the operation department for internal audit.<br>The responsibilities and the procedures included in the Monitoring and Management Manual have been verified. | | |
| c. Is the accuracy of equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board and is controlled and calibrated in accordance with the monitoring plan? | VVM | 205 | Yes.<br>The meters M1 and M2 were calibrated by Weifang Power Company Meter Measuring Centre. The accuracy of the meters is 0.5S. The certificates of the calibration and calibrator have been provided by the PP and verified by BVC during the on-site visit. It is consistent with the monitoring plan. | OK | OK |
| i. Are monitoring results consistently recorded as per approved frequency? | VVM | 205 | Yes.<br>The meters have been continously measured and monthly recorded consistent with the MP. | OK | OK |
| ii. Have quality assurance and quality control procedures been applied in accordance with the monitoring plan monitoring plan? | VVM | 205 | Yes.<br>The QA/QC procedures have been documented in the Monitoring and Management Manual and applied in accordance with the MP. | OK | OK |
| ***5. Assessment of data and calculation of greenhouse gas emission reductions*** | | | | | |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| a. Is a complete set of data for the specified monitoring period is available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation prior to submitting request for issuance if appropriate). | VVM | 208 | Yes.<br>A complete set of the sale receipts and reading records have been provided and verified during the on-site visit. The reading records can cover the monitoring period from 19/07/2010 to 24/12/2010. And the sale receipts can cover the period from 23/07/2010 to 24/12/2010 while the emission reductions from 19/07/2010 to 22/07/2010 are not claimed for the monitoring period. | OK | OK |
| b. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis? | VVM | 208 | The information provided in the monitoring report has been found consistent with sale receipts issued by the grid company.<br>~~CL-1~~<br>~~No information about the data of reading records was included in the MR and ER calculation spreadsheet.~~<br>CL-1 was closed out after the data of reading records was included in the MR and ER calculation spreadsheet and the crosscheck procedure has been done. | ~~CL-1~~ | OK |
| c. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in | VVM | 208 | Yes.<br>The calculation of baseline emissions, project emissions and leakage has been carried out in accordance with monitoring | OK | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| accordance with the formulae and methods described in the monitoring plan and the applied methodology document? | | | plan and applied the methodology document. | | |
| d. Have any assumptions used in emission calculations been justified? | VVM | 208 | No.<br>There are no assumptions in emission calculations. | OK | OK |
| e. Have appropriate emission factors, IPCC default values and other reference values been correctly applied? | VVM | 208 | Yes.<br>The emission factor in the MR is 1.0548t$CO_2$/MWh, which is the same as described in the registered PDD. | OK | OK |

**Table 2 - Verification requirements based on the Guidelines on Completeness Check of Requests for Issuance (EB48 - Annex 68)**

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| ***1. Does Monitoring Report contain:*** | EB48 Ann 68 | | | | |
| a. The implementation status of the project during the monitoring period under consideration? | EB48 Ann68 | 10(a)i | There were no special events during the monitoring period. No equipment was exchanged or overhauled.<br>~~CL-2~~<br>~~The date when the Project started commissioning indicated in the MR is not consistent with the operation log of the Project.~~<br>CL-2 was closed out after the commissioning date indicated in the revised MR was corrected. | ~~CL-2~~ | OK |
| b. Monitoring systems and procedures, including any quality assurance and quality control system employed by the project activity? | EB48 Ann68 | 10(a)ii | The description of the monitoring system and the diagram has been included in the MR.<br>~~CL-3~~<br>~~Data collection systems, organizational structure, role and responsibility of personnel and emergency procedures are not included in Section C of MR, which are required by EB54 Annex34.~~<br>CL-3 was closed out after data collection systems, organizational structure, role and responsibility of personnel and emergency procedures were included in the revised MR. | ~~CL-3~~ | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| c. All parameters required to be monitored and reported at the intervals required by the monitoring plan and the applied methodology? | EB48 Ann68 | 10(a)iii | $EG_{out,y}$: On-grid electricity supplied to NCPG by the Project<br>$EG_{in,y}$: On-grid electricity purchased from NCPG by the Project for the plant operation. | OK | OK |
| d. Information on calibration of monitoring instruments as specified by the monitoring methodology and the monitoring plan? | EB48 Ann68 | 10(a)iv | Information on calibration of monitoring instruments has been included in Section D of MR.<br>~~CAR-1~~<br>~~Calibration date of the meters and calibrator's name in Section D.2 of MR are not consistent with the provided calibration certificates.~~<br>CAR-1 was closed out after the calibration information of the meters was corrected in the revised MR as per the provided calibration certificates. | ~~CAR-1~~ | OK |
| e. Emission factors, IPCC default values, and other reference values used in the calculation of emission reductions? | EB48 Ann68 | 10(a)v | Yes.<br>1.0548tCO2e/MWh, the same as indicated in registered PDD. | OK | OK |
| f. Reference to any deviation request approved by the Executive Board for the monitoring period in consideration? | EB48 Ann68 | 10(a)vi | N.A. | OK | OK |
| g. Calculations of baseline emissions, project emissions, leakage (if any), and emission reductions, including reference to formulae and methods used? | EB48 Ann68 | 10(a)vii | Yes.<br>Baseline emissions, project emissions, leakage, and emission reductions, including reference to formulae and methods used were correctly calculated. | OK | OK |
| h. Comparison of the actual emission reduction claimed in the monitoring period with the | EB48 | 10(a)viii | ~~CL-4~~<br>~~Clarification is required on that the actual~~ | ~~CL-4~~ | OK |

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|---|---|---|---|---|
| estimate in the registered PDD, and explanation on any significant increase? | Ann68 | | ~~emission reduction claimed in the monitoring period is larger than the estimated value.~~ CL-4 was closed out after the clarification was provided in the MR and the relevant evidence have been provided and verified by BVC and the emission reductions are considered reasonable. | | |
| ***2. Does Spreadsheet of Calculation of Emission Reductions contain:*** | EB48 | Ann 68 | | | |
| a. Values of the monitored parameters? | EB48 Ann68 | 10(b)i | Yes. | OK | OK |
| b. Formulae of calculation are shown in the spreadsheet cells for ease of assessment, whenever possible? | EB48 Ann68 | 10(b)ii | Yes. | OK | OK |
| c. Any other explanation with regard to application of formulae in the spreadsheet? | EB48 Ann68 | 10(b)iii | Yes. | OK | OK |

**Table 3 Resolution of Corrective Action /Clarification / Forward Action Requests**

| Draft report clarifications and corrective action requests by verification team | Ref. to checklist question in table 1 and table 2 | Summary of project owner response | Verification team conclusion |
|---|---|---|---|
| **CAR-1:** Calibration date of the meters and calibrator's name in Section D.2 of MR are not consistent with the provided calibration certificates | Table 2 1.d | After confirming with the meter calibration certificates, the relevant information has been revised correctly. | The calibration information of the meters has been corrected in the revised MR as per the provided calibration certificates.<br>Hence CAR-1 is closed. |
| **CL-1:** No information about the data of reading records was included in the MR and ER calculation spreadsheet. | Table 1 5.b | The information sourced from the reading records of M1 and M2 have been added in the MR and ER calculation spreadsheet. The conservative value among the reading records of M1 and M2 and sale receipts have been used for emission reduction calculation. | The data from reading records have been added in the MR and ER calculation. The cross-check procedure has also been included in the ER calculation. The minor difference between the value of reading recordings and the sale receipts is due to line loss, which is considered reasonable. And the conservative value was used for emission reductions calculation.<br>Hence CL-1 is closed. |
| **CL-2:** The date when the Project started commissioning indicated in the MR is not consistent with the operation log of the Project. | Table 2 1.a | The date has been revised in accordance with the actual situation. | The commissioning date indicated in the revised MR has been corrected, which is in accordance with the operation log of the Project.<br>Hence CL-2 is closed. |

| Draft report clarifications and corrective action requests by verification team | Ref. to checklist question in table 1 and table 2 | Summary of project owner response | Verification team conclusion |
|---|---|---|---|
| **CL-3:** Data collection systems, organizational structure, role and responsibility of personnel and emergency procedures are not included in Section C of MR, which are required by EB54 Annex34. | Table 2 1.b | In accordance with the EB54 annex34, the required information has been added, please check it. | Data collection systems, organizational structure, role and responsibility of personnel and emergency procedures have been included in the revised MR. The relevant evidence has been provded by the PP and verified by BVC during the on-site visit.<br>Hence CL-3 is closed. |

| Draft report clarifications and corrective action requests by verification team | Ref. to checklist question in table 1 and table 2 | Summary of project owner response | Verification team conclusion |
|---|---|---|---|
| **CL-4:** Clarification is required on that the actual emission reduction claimed in the monitoring period is larger than the estimated value. | Table 2 1.h | The actual emission reductions claimed for the monitoring period are 49,708 $tCO_2$, which is 12% higher than the estimated value of 44,330 $tCO_2$. Since this monitoring period only covers 159 days and the annual emission reduction has been adopted to assess in the PDD, thus it is reasonable to compare the actual emission reduction with the whole year. In accordance with the reading records, the $EG_y$ during the whole 2010 year is 118,836.96MWh, thus with an annual emission reduction of 125,349.225$tCO_2$. Comparing with the annual emission reduction in PDD (101,765 $tCO_2$), the actual emission reduction is 23.18% higher.<br>As per the FSR, the average wind speed in that period is 2.79m/s(from 1988 to 2006). according to the "2010 year Wind Speed in Shouguang City" provided by Shouguang Weather Station, the actual local wind speed in 2010 is 3.05m/s. Theoretically, the actual wind power density in 2010 is 30.64% higher than the estimated value, thus leading to 30.64% of the net electricity and emission reductions higher than the estimated value. The actual emission reduction is 23.18% higher than the estimated value, which is within the reasonable range of 30.64%.<br>Please refer to the MR for details. | BVC has checked the provided FSR of the Project and can confirms that the estimated emission reductions were based on the he statistic historical wind data during 1988-2006 year from the Shouguang Weather Station and the historical average speed is 2.79m/s. BVC has also checked the evidence of "2010 year Wind Speed in Shouguang City" provided by Shouguang Weather Station and confirms that the wind speed in 2010 is 3.05m/s. Therefore it can be concluded the year in the monitoring period is a strong-wind year and such high wind speed has also happened in 1997.<br>Based on the fact that electricity generated by the Project is dependent on wind power density, which is theoretically proportional to the cube of wind speed, actual electricity generation could be 30.64% higher. Hence the actual increase of electricity by 23.18% falls within the reasonable range.<br>Therefore, the actual emission reductions of 49,708 $tCO_2$ are deemed reasonable.<br>Hence CL-4 is closed. |