



VERIFICATION REPORT SOUTH POLE CARBON ASSET MANAGEMENT LTD.

VERIFICATION OF THE MIAOLI 49.8MW WIND FARM PROJECT

REPORT No. **BVC/TWN-VR/0005/2012**

REVISION No. **01**

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France



VERIFICATION REPORT

Date of first issue: 05/02/2013	Organizational unit: Bureau Veritas Certification Holding SAS
Client: South Pole Carbon Asset Management Ltd.	Client ref.: Andrew Yeoh

Summary:

Bureau Veritas Certification has conducted the 1st periodic verification of Miaoli 49.8MW Wind Farm Project, GS Registration Reference Number GS931, owned by Miaoli Wind Co., which is located in Miaoli County, Taiwan, and applying the methodology ACM0002 (Version 11), on the basis of Gold Standard version 2.2 requirements, UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up 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.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the validated and registered Gold Standard project design documents. Installed equipments being essential for generating emission reduction run reliably and are calibrated appropriately. The monitoring system is in place, the monitoring requirements as per Gold Standard have been complied with, and the project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements, and the emission reductions verified totalize 206,819 tons of CO₂e for the monitoring period.

Our opinion relates to the projects' GHG emissions reductions reported, sustainability performance and related to the valid and registered project baseline, monitoring plan and its associated documents.

Reporting period: 03/07/2010 to 02/07/2012
 Baseline emissions: 206,819 t CO₂ equivalents.
 Project emissions: 0 t CO₂ equivalents.
 Leakage emissions: 0 t CO₂ equivalents.
 Emission Reductions: 206,819 t CO₂ equivalents.

Report No.: BVC/TWN-VR/0005/2012	Subject Group: Gold Standard
Project title: Miaoli 49.8MW Wind Farm Project	
Work carried out by: Mr. Andrew C.C. Lee - Team Leader Ms. Zhang Chen - Team Member	
Internal Technical Review carried out by: Mr. Peter Huang Qin	
Date of this revision: 23/09/2014	Rev. No.: 01
Number of pages: 43	

Indexing terms

Work approved by:

Fabien Joly de Bresillon

- ☒ No distribution without permission from the Client or responsible organizational unit
- ☐ Limited distribution
- ☐ Unrestricted distribution



Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
DRR	Daily Reading Record
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Green House Gas(es)
GS	Gold Standard
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
MRR	Monthly Reading Record
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard



Table of Contents	Page
1. INTRODUCTION	5
1.1. Objective	5
1.2. Scope	5
1.3. GHG Project Description	6
1.4. Verification Team	7
2. METHODOLOGY	7
2.1. Review of Documents	7
2.2. Follow-up Interviews	8
2.3. Resolution of Clarification, Corrective and Forward Action Requests	8
2.4. Internal Technical Review	9
3. VERIFICATION CONCLUSIONS.....	10
3.1. Remaining issues from validation or previous verification (258)	10
3.2. Compliance of the project implementation with the registered project design document (273)	10
3.3. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) (277)	11
3.4. Compliance of GHG monitoring activities with the monitoring plan (280-281)	12
3.5. Compliance of SD monitoring activities with the SD monitoring plan	13
3.6. Compliance with the calibration frequency requirements for measuring instruments (288)	14
3.7. Assessment of data and calculation of emission reductions (291)	15
4. VERIFICATION OPINION.....	19
5. REFERENCES	20
6. CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS.....	22
APPENDIX A: GHG PROJECT VERIFICATION PROTOCOL.....	23
ACM0002 (VERSION 11)ACM0002 (VERSION 11)	36



1. INTRODUCTION

South Pole Carbon Asset Management Ltd. has commissioned Bureau Veritas Certification to verify the emissions reductions of the GS-VER project Miaoli 49.8MW Wind Farm Project (hereafter called “**the Project**”) which was owned by Macquarie International Infrastructure Fund Limited (hereafter referred to as “MIIF”) during the monitoring period and is currently owned by Emerging Markets Infrastructure (hereafter referred to as “EMIF”) at Miaoli County, Taiwan.

This report summarizes the findings of the verification of the Project, performed on the basis of Gold Standard version 2.2 requirements, UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The objective of verification is to conduct a thorough, independent assessment of the registered project activities.

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of Gold Standard version 2.2. In particular, this assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the registered PDD and GS Passport, 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, verifiable, and in accordance with applicable GS 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 including applicable tool(s);
- (d) Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

1.2. Scope

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions. The verification is based on the validated and registered project design document, the monitoring report, emission reduction calculation spreadsheet, and supporting documents. The information in these documents is reviewed against Gold Standard version 2.2 requirements, 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 is a green field wind-farm project located in Miaoli County, Taiwan. It involves the installation of 25 wind turbine generators (WTGs) supplied by Enercon in two separate areas, 21 sets of WTGs in Houlong Township (Dapong site), and 4 WTGs in Chunan Township (Chunan site).

Except for one WTG in Chunan which has a rated power of 1800kW, all other WTGs have a rated output of 2000kW, providing a total capacity of 49.8MW.

The annual expected electricity supplied to Taipower Grid (TCPG) is 186,509MWh and the annual estimated emission reductions are 133,167tCO₂e.

The Project has been retroactively registered to GS on 03/07/2012 (Project ID: GS931) under approved CDM methodology ACM0002 version 11 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /9/.

According to GS requirement 2.2 V.a.2.3, "project activities proceeding under the retroactive project cycle, may be eligible for retroactive crediting for realised emission reductions prior to Gold Standard registration of a maximum period of two years" /8/. In the context of the proposed project, the maximum retroactive crediting period is from 03/07/2010 to 02/07/2012.

The Project has chosen the renewable crediting period in the registered PDD, the first renewable crediting period is from 03/07/2010 to 02/07/2017.

This is the 1st periodic verification of the Project covering the entire retroactive crediting period from 03/07/2010 to 02/07/2012.

Project title:	Miaoli 49.8MW Wind Farm Project
GS ref number:	GS931
Registration Date:	03/7/2012
Crediting Period:	03/07/2010 to 02/07/2017 (renewable)
Monitoring Period:	03/07/2010 to 02/07/2012
Methodologies used	ACM0002 (Version 11)
Location of the Project:	Houlong Township (Dapong site) and Chunan Township (Chunan site), Miaoli County, Taiwan
Geo coordinates:	24°35'37.42"N and 120°42'58.68"E (Dapong Site) 24°43'0.27"N and 120°51'48.60"E (Chunan Site)
GS project registry:	http://mer.markit.com/br-reg/public/project.jsp?project_id=103000000001998

[Post Registration Changes]

No post registration changes have been requested.



1.4. Verification Team

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 1.2	TASK PERFORMED*
Team Leader	Mr. Andrew C.C. Lee	☐	☒ DR ☒ SV ☒ RI ☐ TR
Team Member	Ms. Zhang Chen	☒	☒ DR ☒ SV ☐ RI ☐ TR
Technical Specialist	N.A.	☐	☐ DR ☐ SV ☐ RI ☐ TR
Internal Technical Reviewer (ITR)	Mr. Peter Huang Qin	☒	☐ DR ☐ SV ☐ RI ☒ TR
Specialist supporting ITR	N.A.	☐	☐ DR ☐ SV ☐ RI ☐ TR

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

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 07.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board at its 79th meeting on 01/06/2014 /7/, and the Gold Standard Toolkit version 2.2 issued by Gold Standard Foundation on 01/06/2012 /8/. 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 GS-VER 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 assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (MR) version 13.0 dated 15/09/2014 /5/ and emission reduction calculation spreadsheet version 13 dated 15/09/2014 /6/. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:



- (a) The registered PDD, GS Passport and the monitoring plan /1//2/;
- (b) The validation report /3/;
- (c) The applied monitoring methodology ACM0002 (Version 11) /9/;
- (d) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, laboratory analysis or national regulations) /10/.

2.2. Follow-up Interviews

From 11/12/2012 to 12/12/2012 and on 14/07/2014, Bureau Veritas Certification performed site visits and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EMIF - Miaoli Wind Co., Solvent, Enercon and South Pole Carbon Asset Management Ltd. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
EMIF - Miaoli Wind Co. (Project Owner)	➤ Project Design and implementation
Solvent (O&M contractor)	➤ Technical equipment, calibration and operation
Enercon (Wind turbine manufacturer)	➤ Monitoring Plan and management procedures
	➤ Monitoring data
	➤ Data uncertainty and residual risks (QA/QC)
	➤ GHG Calculation
	➤ Environmental Impacts
	➤ Compliance with National Laws and Regulations
South Pole Carbon Asset Management Ltd. (Consultant)	➤ Monitoring Plan
	➤ Monitored data and Monitoring Report
	➤ GHG Calculations

2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions and sustainable development or influence the monitoring and reporting of emission reductions and sustainable development prior to Bureau Veritas Certification's positive conclusion on the GHG emission reduction calculation and the project's sustainability performance.

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

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:



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

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable GS requirements have been met.

A Forward Action Request (FAR) is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

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 Technical Review

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of GS-VERs 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 GS 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 may raise Clarification Requests to the verification team and discusses these matters with Team Leader.



After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted for further processing such as uploading on the GS registry.

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 CAR(s), 6 CL(s).

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

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

3.1. Remaining issues from validation or previous verification (258)

All CARs and CLs raised were successfully closed during the validation stage and previous verification of the Project, no remaining issues were left.

3.2. Compliance of the project implementation with the registered project design document (273)

Bureau Veritas Certification has performed site visits and found that the Project has been put into operation and the electricity generated is supplied to Taipower Grid (TCPG) according to the signed Power Purchase Agreement (PPA) /12/. 25 sets of WTGs (ENERCON E-70 E4) with unit capacity of 2,000kW (24 sets) and 1,800kW (1 set) /11/, providing a total installed capacity of 49.8MW have been in operation during the monitoring period.

According to the electricity receipts issued by the grid company /16/, the Project started commissioning on 10/02/2006.

No changes to the project design have been identified during this verification. The implementation and operation of the project activity have been conducted in accordance with the description contained in the registered PDD.

[Power System]

- Dapong Wind Farm:

As shown in the diagram of the power connection system /13/, the electricity generated by 21 sets of WTGs is delivered to the Tung-Ho Steel 161kV substation. After boosting from 22.8kV to 161kV, the electricity is finally fed into Taipower Grid (TCPG).



- Chunan Wind Farm:

As shown in the diagram of the power connection system /13/, the electricity generated by 4 sets of WTGs is delivered to Shanjia 22.8kV substation and then fed into Taipower Grid (TCPG).

[Metering System]

There are two bi-directional meters installed for the Project as per the monitoring plan.

- Dapong Wind Farm:

One meter (S/N: 10940038) is for Dapong Wind Farm. It was installed at high voltage side of 22.8kV/161kV Tung-Ho Steel substation to measure the electricity exported to and imported from the grid by Dapong wind Farm. The meter (S/N: 10940038) was installed on 08/09/2010 which replaced an old one (S/N: 04940025) at the same place /17/.

- Chunan Wind Farm:

The other meter (S/N: 68940058) is for Chunan Wind Farm. It was installed in Shanjia 22.8kV substation to measure the electricity exported to and imported from the grid by Chunan Wind Farm.

[Management and Operation]

The PP has operated the Project as per the registered PDD and GS Passport. The monitoring organization has been set up and all monitoring staffs have been trained. Meter reading records of all the meters are based on continuously measurement and monthly recorded by the PP. The grid company issues the Electricity Transaction Notes (ETNs) to the PP every month to confirm the electricity exported to and imported from the grid. GS-VER Monitoring & Management Manual /29/ and internal training records /20/ have been provided and verified by the verification team.



Corresponding to the paragraph 273 of VVS version 07.0, Bureau Veritas Certification 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 (data and variables) provided in the monitoring report that is different from that stated in the registered PDD is reported.

3.3. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) (277)

The verification team has verified the 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.



- ✌ Corresponding to the paragraph 277 of VVS version 07.0, Bureau Veritas Certification can confirm that the monitoring plan is in accordance with the approved methodology including applicable tool(s) applied by the Project.

3.4. Compliance of GHG monitoring activities with the monitoring plan (280-281)

GHG monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

[GHG Parameters and information flow]

The parameters required by the GHG monitoring plan and how Bureau Veritas Certification has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these GHG parameters including the values in the monitoring report are described below:

GHG parameters monitored:

- (1) $EG_{e,y}$, Quantity of electricity generation supplied by the project plant/unit to the grid
- (2) $EG_{i,y}$, Quantity of electricity consumption of the project plant/unit from the grid
- (3) $EG_{PJ,y}$, Quantity of net electricity supplied by the project plant/unit to the grid

The net electricity supplied to the grid by the Project ($EG_{PJ,y}$) is the electricity exported to the grid ($EG_{e,y}$) minus the electricity imported from the grid by the Project ($EG_{i,y}$) which is measured by two bidirectional meters. Therefore $EG_{PJ,y}$ can be calculated as below:

$$EG_{PJ,y} = EG_{e,y} - EG_{i,y}$$

As described above, the meters have been installed in accordance with the registered PDD. The verification team has checked on-site the location of the meters against the diagram of power connection system and found them to be consistent.

The readings of the meters are continuously monitored and monthly recorded by the PP and the grid company. End of each month (the date is not fixed) is the cut-off time to calculate the monthly electricity exchange with the grid. The grid company provided the PP with the Electricity Transaction Notes (ETNs or receipts) /16/ monthly, which contain the electricity exported to and imported from the grid by the Project. After a cross-check with its own Monthly Reading Records (MRR) /14/, the project owner reports the data in the monitoring report.

The verification team has verified the values provided in the monitoring report and ER spreadsheet against the relevant documented evidences i.e. the MRRs /14/ and ETNs /16/ and found them to be consistent with the evidences. The MRRs and the ETNs can cover this monitoring period from 03/07/2010 to 02/07/2012.

GHG parameters determined ex-ante:

- (1) $EF_{grid, CM,y}$, emission factor of the grid



The emission factor of the 1st crediting period of the Project has been determined ex-ante in the registered PDD/1/. The emission factor used in the monitoring report has been verified against the PDD and found them to be consistent.

✎ Corresponding to the paragraph 280 and 281 of VVS version 07.0, Bureau Veritas Certification can confirm that:

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

3.5. Compliance of SD monitoring activities with the SD monitoring plan

No.1 Air Quality – NO_x, SO_x emission reductions

As per the SD monitoring plan, the “Air quality” indicator is roughly monitored via the project’s electricity generation with reference to the atmospheric pollution emissions associated with the fossil fuel-based grid electricity generation in the region. The chosen parameter will be calculated based on the SO_x and NO_x emissions/kWh announced by the grid company.

According to the latest statistic data, 342 kg of SO_x and 354 kg of NO_x are generated for every GWh electricity produced in 2010, 356 kg of SO_x and 364 kg of NO_x are generated for every GWh electricity produced in 2011 and 328 kg of SO_x and 337 kg of NO_x are generated for every GWh electricity produced in 2012. The total net electricity delivered to the grid by the project during this monitoring period is 289,663,587 KWh, which means that the project has mitigated approximately of 100.15 tonnes SO_x and 102.79 tonnes NO_x.

The verification team has checked Taipower’s latest announcement /22/ and found that the data used is appropriately sourced from the latest statistic data and the calculation is correct.

No.2 Quantitative Employment and Income Generation - Number of jobs, salary level

As per the SD monitoring plan, the chosen parameters for “Quantitative Employment and Income Generation” indicator are number of jobs and salary level, the same will be monitored by checking copy of employment contract /23/ and the labor insurance list from Labor Insurance Bureau /24/.

The verification team has checked the official document issued by Bureau of Labor Insurance (dated: 10/01/2012) /24/ and confirmed that 2 permanent positions have been provided by the Project and the salary of all employees are above minimum wage regulated by Taiwan’s Labor Standard Act /26/.



No.3 Biodiversity - obstruction lights

As per the SD monitoring plan, obstruction lightings were installed on the turbines, in order to enhance the safety precautions of the wind farm towards the birds.

The verification team has confirmed the existence of such facility by reviewing the photo records /27/ and on-site inspection. In addition, the verification team has also checked turbine maintenance records /28/ and confirms that the obstruction lights status is also one of the checking items in the regular maintenance work.

No.4 Biodiversity - Landscaping at Bantianliao (Haowangjiao)

As per the SD monitoring plan, the green landscaping at Bantianliao will be continuous maintained.

The verification team has visited Bantianliao during the site visit and confirmed that the green landscaping exists including green fence, greensward, and trees. The photos provided in the monitoring report reflect the actual situation on site.

3.6. Compliance with the calibration frequency requirements for measuring instruments (288)

The registered monitoring plan requires that the accuracy of meters is 0.5 and the calibration frequency is 8 years.

During this monitoring period, the installed measuring instruments have been operating well and were duly calibrated. The calibration records are shown in below.

Table 2 The calibration records of the meters /18/

Meter ID	Serial number	Accuracy	Calibration date	Validity	Operation period
Dapong Meter (old)	04940025	0.5	16/07/2004	Yes*	19/04/2006 – 08/09/2010
Dapong Meter (new)	10940038	0.5	27/08/2010	Yes*	08/09/2010 – Present
Chunan Meter	68940058	0.5	21/02/2008	Yes*	10/02/2006 – Present

* Calibration Entity: Taiwan Electric Research & Testing Center - Lab. No.1329 /19/

[Instrument accuracy]

The verification team has verified the calibration records and the accreditation certificates of the calibration entity. All the meters meet the rated accuracy level as described in the monitoring plan and are in compliance with the national standard Technical Specification for Verification and Inspection of Electricity Meters (CNMV 46) /10/.



[Calibration frequency]

The calibration frequency fulfills the requirement as described in the monitoring plan and is in compliance with the national standard Technical Specification for Verification and Inspection of Electricity Meters (CNMV 46) /10/.



Corresponding to the paragraph 288 of VVS version 07.0, Bureau Veritas Certification can confirm that:

- The calibration is conducted at the frequency as specified by the methodology and the monitoring plan contained in the registered PDD.

3.7. Assessment of data and calculation of emission reductions (291)

Most of the data for the specified monitoring period is available.

Partial data of the electricity import ($EG_{i,y}$) and export ($EG_{e,y}$) are not available because the meter readings are recorded monthly only at the end of each month, and the meter readings on the first day and last day of this monitoring period are not recorded. A CAR was raised for this issue and PP adopts a conservative approach to solve this issue. Please refer to **CAR 1**.

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 are maintained in the identified records. All the data are in compliance with that stated in the final Monitoring Report.

As per the methodology ACM0002 (Version 11) 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

[Baseline emissions]

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

$$BE_y = EF_{\text{grid,CM,y}} * EG_{\text{PJ,y}}$$

$EF_{\text{grid,CM,y}}$: GHG emission factor of the Taipower Grid (TCPG), calculated ex-ante in the registered PDD as 0.714 tCO₂e/MWh

$EG_{PJ,y}$: Net electricity supplied to the grid

The net electricity delivered to the grid ($EG_{PJ,y}$) can be calculated as:

$$EG_{PJ,y} = EG_{e,y} - EG_{i,y}$$

The verification team has cross-checked the values from the meter reading records /14/ with the ETNs (receipts) /16/ and continuous measurement records of turbine generation /15/ for the period from 03/07/2010 to 02/07/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 3.

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

Period	Wind Farm	EG_{export} (A)	EG_{import} (B)	EG_y (kWh) (A-B)
03/07/2010 ~ 27/07/2010	Dapong	5,130,667	9,600	5,121,067
	Chunan	1,326,667	2,400	1,324,267
28/07/2010 ~ 26/08/2010	Dapong	3,571,200	16,000	3,555,200
	Chunan	751,200	3,200	748,000
27/08/2010 ~ 27/09/2010	Dapong	4,022,400	19,200	4,003,200
	Chunan	667,200	4,800	662,400
28/09/2010 ~ 26/10/2010	Dapong	13,529,600	6,400	13,523,200
	Chunan	2,104,800	1,600	2,103,200
27/10/2010 ~ 25/11/2010	Dapong	15,782,400	9,600	15,772,800
	Chunan	2,583,200	1,600	2,581,600
26/11/2010 ~ 28/12/2010	Dapong	10,899,200	9,600	10,889,600
	Chunan	1,472,000	2,400	1,469,600
29/12/2010 ~ 26/01/2011	Dapong	21,110,400	0	21,110,400
	Chunan	2,986,400	800	2,985,600
27/01/2011 ~ 22/02/2011	Dapong	15,676,800	9,600	15,667,200
	Chunan	2,173,600	1,600	2,172,000
23/02/2011 ~ 28/03/2011	Dapong	15,689,600	3,200	15,686,400
	Chunan	2,418,400	1,600	2,416,800
29/03/2011 ~ 26/04/2011	Dapong	7,932,800	12,800	7,920,000
	Chunan	1,124,800	2,400	1,122,400
27/04/2011 ~ 26/05/2011	Dapong	4,208,000	25,600	4,182,400
	Chunan	720,800	5,600	715,200
27/05/2011 ~ 27/06/2011	Dapong	6,448,000	16,000	6,432,000
	Chunan	1,572,800	3,200	1,569,600
28/06/2011 ~ 26/07/2011	Dapong	4,329,600	12,800	4,316,800
	Chunan	815,200	3,200	812,000

27/07/2011 ~ 28/08/2011	Dapong	3,216,000	32,000	3,184,000
	Chunan	678,400	4,800	673,600
29/08/2011 ~ 27/09/2011	Dapong	7,475,200	19,200	7,456,000
	Chunan	971,200	3,200	968,000
28/09/2011 ~ 26/10/2011	Dapong	11,500,800	25,600	11,475,200
	Chunan	2,163,200	4,000	2,159,200
27/10/2011 ~ 27/11/2011	Dapong	13,494,400	16,000	13,478,400
	Chunan	1,997,600	2,400	1,995,200
28/11/2011 ~ 27/12/2011	Dapong	21,152,000	6,400	21,145,600
	Chunan	3,236,800	1,600	3,235,200
28/12/2011 ~ 29/01/2012	Dapong	19,222,400	3,200	19,219,200
	Chunan	2,604,800	800	2,604,000
30/01/2012 ~ 22/02/2012	Dapong	12,195,200	3,200	12,192,000
	Chunan	1,692,000	2,400	1,689,600
23/02/2012 ~ 27/03/2012	Dapong	14,342,400	6,400	14,336,000
	Chunan	2,124,000	2,400	2,121,600
28/03/2012 ~ 25/04/2012	Dapong	4,179,200	22,400	4,156,800
	Chunan	835,200	3,200	832,000
26/04/2012 ~ 28/05/2012	Dapong	6,611,200	12,800	6,598,400
	Chunan	1,166,400	4,000	1,162,400
29/05/2012 ~ 26/06/2012	Dapong	8,352,000	16,000	8,336,000
	Chunan	1,514,400	3,200	1,511,200
27/06/2012 ~ 02/07/2012	Dapong	254,607	22,400	232,207
	Chunan	47,647	8,800	38,847
Total	--	290,074,787	411,200	289,663,587

$$EG_{PJ,y} = EG_{e,y} - EG_{i,y} = 290,074,787 \text{ KWh} - 411,200 \text{ KWh} = 289,663,587 \text{ KWh}$$

The baseline emissions of the Project are calculated as:

$$BE_y = EF_{\text{grid,CM,y}} * EG_{PJ,y} = 0.714 \text{ tCO}_2\text{e/MWh} * 289,663,587 \text{ KWh}/1000 = 206,819 \text{ tCO}_2\text{e}$$

[Project emissions]

The Project is a newly built wind project, thus according to ACM0002 (Version 11) the project emissions are zero.

[Leakage emissions]

No leakage needs to be considered according to ACM0002 (Version 11).

**[Emission reductions]**

The emission reductions during the monitoring period from 03/07/2010 to 02/07/2012 are calculated as:

$$ER_y = BE_y - PE_y - L_y = 206,819 - 0 - 0 = 206,819 \text{ tCO}_2\text{e}$$

[Comparison of ERs]

The annual estimated emission reductions are 133,167 tCO₂e as per the registered PDD. The actual operation days of the Project in the monitoring period are 730 days. The corresponding estimate in the monitoring period are 266,698.84(=133,167*731/365) tCO₂e. The actual emission reductions are 22.44% less than the estimated value in the monitoring period. The variation is deemed to be reasonable.



Corresponding to the paragraph 291 of VVS version 07.0, Bureau Veritas Certification can confirm that:

- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the registered PDD.
- Information and data provided in the monitoring report have been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis.
- Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.
- Assumptions, emission factors and default values that were applied in the calculations have been justified.



4. VERIFICATION OPINION

Bureau Veritas Certification has performed the 1st periodic verification of Miaoli 49.8MW Wind Farm Project, GS Registration Reference Number GS931, which is located in Miaoli County, Taiwan, and applying the methodology ACM0002 (Version 11). The verification was performed based on the Gold Standard version 2.2 requirements 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, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Miaoli Wind Co. is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the monitoring plan contained 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.

Bureau Veritas Certification has verified the project Monitoring Report version 13.0 dated 15/09/2014 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as described in the validated project design documents. Installed equipments being essential for generating emission reductions run reliably and are calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions as a GS-VER project.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and registered project baseline, approved 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, Bureau Veritas Certification confirms the following statement:

Reporting period:	03/07/2010 to 02/07/2012
Baseline emissions:	206,819 t CO ₂ equivalents
Project emissions:	0 t CO ₂ equivalents
Leakage emissions:	0 t CO ₂ equivalents
Emission Reductions:	206,819 t CO ₂ equivalents

Mr. Peter Huang Qin
Internal Technical Reviewer
23/09/2014

Mr. Andrew C.C. Lee
Team Leader
23/09/2014



5. REFERENCES

Documents reviewed:

- /1/ Registered PDD version 06 dated 14/3/2012, ref no.GS931
- /2/ Registered GS Passport version 08 dated 11/07/2012
- /3/ Validation Report revision 01, dated 01/05/2012
- /4/ Monitoring Report version 01, dated 02/11/2012
- /5/ Monitoring Report version 13.0, dated 15/09/2014
- /6/ ER Calculation Spreadsheet version 13, dated 15/09/2014
- /7/ Validation and Verification Standard Version 07.0 dated 01/06/2014
- /8/ Gold Standard version 2.2 dated 01/06/2012
- /9/ ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 11 dated 12/02/2010
- /10/ Technical Specification for Verification and Inspection of Electricity Meters (CNMV 46)
- /11/ Technical Documents of the Wind Turbine, ENERCON E70 E4
- /12/ Signed Power Purchase Agreement (PPA) dated 02/3/2006
- /13/ Diagrams of Power connection system of Dapong and Chunan Wind Farm
- /14/ Meter Reading Records (MRR) produced by project owner
- /15/ Turbine Generation Continuous Measurement Records
- /16/ Electricity Transaction Notes (ETNs or receipts) issued by the Grid Company
- /17/ Meters replacement record of Dapong Wind Farm
- /18/ Calibration Records of the Electricity Meters
- /19/ Accreditation Certificate of Taiwan Electric Research & Testing Center with the valid period from 15/11/2013 to 14/11/2016, initial certification date 15/11/2004 (has been renewed every three years according to a statement from Taiwan Accreditation Foundation)
- /20/ Training Records and Qualification Certificate of Operation Staff
- /21/ Statement for MOF card written mistake issued by grid company dated 17/01/2013
- /22/ Taipower Official Website: Business Performance, Past 5 years of Performance (15/03/2013)
<http://www.taipower.com.tw/content/govern/govern01.aspx?MType=5&MSType=14>
- /23/ Copy of employment contract
- /24/ Labor insurance list issued by Bureau of Labor Insurance
- /25/ Official document issued by Bureau of Labor Insurance dated 10/01/2012
- /26/ Labor Standard Act, Taiwan R.O.C
- /27/ Photo records of obstruction lights
- /28/ Turbine maintenance records
- /29/ GS-VER Monitoring & Management Manual

Persons interviewed:

Miaoli Wind Co.

- /1/ Mr. Hal Falls Commercial Manager

VERIFICATION REPORT



/2/	Mr. Jason Wang	Engineer
/3/	Mr. Wim Dýhman	Service Engineer
/4/	Mr. Jacky Chang	Service Engineer
/5/	Mr. Shih JhongChiang	Service Engineer
/6/	Mr. Sie ChiangYe	Service Engineer
	South Pole Carbon Asset Management Ltd.	
/7/	Mr. Jules Chuang	Principal
/8/	Ms. Litsey Corona	Assistant Project Manager
/9/	Ms. Siao HanWun	Assistant Project Manager



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

Mr. Andrew C.C. Lee	Bureau Veritas Certification, R.O.C Taiwan	Team Leader, Climate Change Lead Verifier He holds a Master Degree in Environment Engineering. Before joining BV in March 2007, he gained one years of environmental engineering service and more than four years of software programming experience in information technology industry. He obtained the certificate of GHG Lead Verifier, Lead Auditor for EMS ISO 14001 and Auditor for OHSAS 18001. He is also a Lead Verifier for ISO 14064-1:2006 and ISO 14064-2:2006.
Ms. Zhang Chen	Bureau Veritas Certification, China	Team Member, Climate Change Lead Verifier. She holds Master Degree in Environmental Economics and Environmental Engineering. Before joining BV in 2010, she has gained various experiences in project financing evaluation, policy cost-benefit analysis and environmental management. She is a member of Sino-Franco Urban Sustainable Development Association. She obtained the certificate of GHG Lead Verifier and ISO 14064.
Mr. Peter Huang Qin	Bureau Veritas Certification, China	Technical Reviewer, Climate Change Lead Verifier. He holds a Master Degree in Industrial Ecology. Before joining BV in Jan 2010, he gained one and half years of CDM audit experience and two years of technical experience in power industry. He obtained the certificate of GHG Auditor, Lead Auditor for EMS ISO 14001 and has successfully completed the course assessment for ISO 14064:2006.

APPENDIX A: GHG PROJECT VERIFICATION PROTOCOL

Table 1 Verification requirements based on the Clean Development Mechanism Validation and Verification Standard (Version 07.0)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Compliance of the project implementation with the registered project design document					
a. Has the implementation and operation of the project activity been conducted in accordance with the description contained in the registered PDD?	VVS	226	Yes. The project involves two separate areas in Miaoli county, Taiwan: A 7.8MW wind farm with 4 turbines is located in Chunan township, Miaoli county (called Chunan site). All 4 turbines are connected to 22.8kV/22.8kV Shanjia substation. A 42MW wind farm with 21 turbines is located in Houlong township, Miaoli county (called Dapong site). All 21 turbines are connected to 22.8kV/161kV Tung-Ho Steel substation. All facilities and equipments including 25 sets of turbines (Type: ENERCON E70 E4) with a total capacity of 49.8MW are in place. One of turbine in Chunan site has rated power 1,800kW; the other 24 turbines have rated power 2,000kW. The electricity generated by the project has been fed into the national grid of Taiwan – Taipower grid through two substations. According to the registered PDD, the construction start	OK	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			date is 20 May 2005 and started operation in 10 February 2006. As per the electricity receipts issued by the grid company (Taipower), the commissioning of the project began on 10/02/2006.		
b. Are all physical features of the project activity in the registered PDD in place?	VVS	227	Yes. According to the registered PDD and validation report, the wind farm started operation in 10 February 2006 with 25 wind turbines in two separate areas. The turbines were generating electricity except the turbines under maintenance during on-site visit.	OK	OK
c. Have the project participants operated the project activity as per the registered PDD or any approved revised PDD?	VVS	227	According to the registered PDD, the project was developed by Miaoli Wind Co., Ltd (hereafter refer as "Miaoli Wind") and is currently owned by MacquarieInternational Infrastructure Fund Limited (hereafter refer as "MIIF"). ~~CL 1 Please clarify the relationship between project owner and operation entity/organization.~~ The relationship between MIIF, Miaoli Wind Co., Ltd. and Solvent Co., Ltd. is included in MR. The maintenance work carrying out by Solvent had been verified during this on-site visit.	~~CL-1~~	OK.

VERIFICATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl														
			Hence this CL was closed.																
d. Was an on-site visit conducted?	VVS	227	Yes. The verification team conducted site visits on 11/12/2012 ~ 12/12/2012 and 14/07/2014; this Verification Work Plan also uploaded to GS project registry on 10/12/2012. Following persons attended the site visits with signature on attendee list: <table><tr><td>Mr. Hal Falls</td><td>Commercial Manager, Miaoli Wind Company</td></tr><tr><td>Mr. Jason Wang</td><td>Engineer, Miaoli Wind Company</td></tr><tr><td>Mr. Jules Chuang</td><td>Principal, South Pole Carbon</td></tr><tr><td>Mr. Wim Dÿhman</td><td>Service Engineer, ENERCON</td></tr><tr><td>Mr. Jacky Chang</td><td>Service Engineer, ENERCON</td></tr><tr><td>Mr. Shih JhongChiang</td><td>Engineer, Solvent</td></tr><tr><td>Mr. Sie ChiangYe</td><td>Engineer, Solvent</td></tr></table>	Mr. Hal Falls	Commercial Manager, Miaoli Wind Company	Mr. Jason Wang	Engineer, Miaoli Wind Company	Mr. Jules Chuang	Principal, South Pole Carbon	Mr. Wim Dÿhman	Service Engineer, ENERCON	Mr. Jacky Chang	Service Engineer, ENERCON	Mr. Shih JhongChiang	Engineer, Solvent	Mr. Sie ChiangYe	Engineer, Solvent	OK	OK.
Mr. Hal Falls	Commercial Manager, Miaoli Wind Company																		
Mr. Jason Wang	Engineer, Miaoli Wind Company																		
Mr. Jules Chuang	Principal, South Pole Carbon																		
Mr. Wim Dÿhman	Service Engineer, ENERCON																		
Mr. Jacky Chang	Service Engineer, ENERCON																		
Mr. Shih JhongChiang	Engineer, Solvent																		
Mr. Sie ChiangYe	Engineer, Solvent																		

VERIFICATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Ms. Litsey Corona Assistant Project Manager, South Pole Carbon Ms. Siao HanWun Assistant Project Manager, South Pole Carbon		
e. If not, justify the rationale of the decision.	VVS	227	N/A	OK	OK.
2. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s)					
a. Is the monitoring plan of the project activity in accordance with the applied methodology including applicable tool(s)?	VVS	229	Yes. The registered Monitoring Plan (MP) in accordance with the methodology ACM0002 (Version 11) has been applied by the GS-VER project activity.	OK	OK.
b. Is the project implementation in accordance with the provisions of the registered PDD and/or an approved revised PDD?	VVS	230	Yes. The MP and the methodology ACM0002 (Version 11) have been followed by the PP. The monitoring organization has been set up and in functions. All monitoring staffs have been trained and the training records have been provided and verified. The monitoring procedures are in place and function. All parameters indicated in the MP have been measured and recorded in the respective documents. The QA/QC	OK	OK.



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			procedures are in place and function.		
3. Compliance of monitoring activities with the registered monitoring plan					
a. Have the monitoring of parameters related to the GHG emissions reductions in the project activity been implemented in accordance with the monitoring plan contained in the registered PDD or any accepted revised monitoring plan?	VVS	233	Yes. According to registered PDD, the monitoring parameters are as following: ◆ EG_{e,y}: Quantity of electricity generation supplied by the project plant/unit to the grid; ◆ EG_{i,y}: Quantity of electricity consumption of the project plant/unit from the grid; ◆ EG_{PJ,y}: Quantity of net electricity generation supplied by the project plant/unit to the grid; According to sustainability monitoring plan in Gold Standard Passport, the four monitoring parameters are as following: ◆ No.1: Air Quality: NO_x, SO_x emission reductions; ◆ No.2: Quantitative employment and income generation: Number of jobs, salary level; ◆ No.3: Biodiversity: Precaution measures to minimize impact towards plants and birds; ◆ No.4: Biodiversity: Landscaping at Bantianliao	OK	OK.

VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			(Haowangjiao).		
b. Has the monitoring plan been properly implemented and followed by the project participants?	VVS	234	Yes. The MP, the methodology ACM0002 (Version 11) and registered Golad Standard passport have been followed by the PP. The electricity has been continuously measured by the electricity meters and monthly recorded. In the earlier period of the project, meter reading was jointly conducted by the PP and Taipower on monthly basis. The data was read and recorded on paper (called MOF card or Electricity Transaction Notes) by the monitoring staffs of both parties with signature. After the new AMI meters were installed in September 2010, meter reading is recorded remotely and digitally at the Taipower office. Taipower downloads the electronic data from the meter, and then the digital MOF card (ETN) is sent to the project owner via mail/email/fax per request. The remote meter reading procedure started in September 2010 for meter in Tung-Ho Steel Substation. The monitoring organization has been set up and in functions. All monitoring staffs have been trained and the training records have been provided and verified satisfactorily. The monitoring procedures are in place and function. All parameters indicated in the MP have been measured and recorded in the respective documents. The	OK	OK.

VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			QA/QC procedures are in place and function.		
c. Have all parameters stated in the monitoring plan and relevant Board decisions been monitored and updated as applicable, including:	VVS	234	-	-	-
i. Project emission parameters?	VVS	234	The Project is a renewable power generation project activities, wind power project, thus the project emissions of the project are considered to be zero according to the ACM0002 (Version 11).	OK	OK.
ii. Baseline emission parameters?	VVS	234	The net electricity delivered to the grid by the Project (EI_y) is used for baseline emission calculation. There are two meters installed for the Project. One meter was installed at the high voltage side of 22.8kV/161kV Tung-Ho Steel substation in Dapong site to measure the electricity exported to and imported from the grid by 21 turbines; current meter's S/N is 10940038. This meter was installed on 08/09/2010. The replaced meter S/N is 04940025, according to meter replacement record from grid company. Another meter (S/N: 68940058) was installed at the Shanjia substation to measure the electricity exported to	~~CL-2~~	OK.

VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			and imported from the grid by 4 turbines in Chunan site. El_y is calculated as below: $El_y = El_{e,y} - El_{i,y}$ Where: $El_{e,y}$ is the total electricity exported by the Project to the grid in year y measured by all meters. $El_{i,y}$ is the total electricity imported from the grid to the Project in year y measured by all meters. ~~CL 2 Please clarify if the electricity meters were replaced during this monitoring period, since the MOF card (ETN) recorded different S/N.~~ The S/N of two electricity meters verified at two site are 10940038 for Dapong site, and 68940058 for Chunan site. The calibration record of 10940038 (installed on 08/09/2010) had been verified. The written mistake of Chunan site by grid company had been clarified with written statement issued by grid company on 17/01/2013 /21/. Hence this CL was closed.		
iii. Leakage parameters?	VVS	234	N/A According to the registered PDD and the methodology ACM0002 (Version 11), the project does not need to consider the leakage.	OK	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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?	VVS	234	PP has the responsibility of overall monitoring, which has established a monitoring team for monitoring of power generation, power consumption and maintenance and operation of the VER project activity. The responsibilities and the procedures are included in the Monitoring and Management Manual and have been verified. Responsibilities have been allocated to the well trained monitoring staff as per registered Monitoring Plan. The QA / QC procedures are part of management system and well documented. Data collection procedure and information flow have been described in the relevant section of the MR. All the records related to generation, maintenance have been satisfactorily maintained.	OK	OK.
d. Is the equipment used for monitoring in accordance with section 4. below and is controlled and calibrated in accordance with the monitoring plan, the applied methodology, the Board guidance, local/national standards, or as per the manufacturer's specification?	VVS	234	According to registered PDD, the electricity meters will undergo maintenance/calibration according to Taiwan national standard CNMV46, current version is version 3, effective on 16/3/2010. In this standard, meter calibration should take place in every 8 years period. ~~Pending on CL 2~~ Yes, all the meters used for monitoring are controlled and calibrated in accordance with the monitoring plan.	Pending	OK.
e. Are monitoring results consistently recorded	VVS	234	Yes.	OK	OK.

VERIFICATION REPORT



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
as per approved frequency?			The monitored parameters were continuous measurement and at least monthly recording.		
f. Have quality assurance and quality control procedures been applied in accordance with the monitoring plan or the revised monitoring plan?	VVS	234	According to registered PDD, Internal audit will be carried out to check compliance with operational procedures outlined in this monitoring plan. This internal audit will also identify potential possible adjustments for operational procedures to improve monitoring and reporting in future years. ~~CL 3 Please clarify if any internal audit of data quality assurance and quality control had been conducted according to the monitoring plan of registered PDD.~~ The QA/QC procedure and reviewed results, including monthly report from Operation Manager, Mr. Hal Falls, to MIIF, had been verified during this on-site visit. Hence this CL was closed.	CL 3	OK.
4. Compliance with calibration frequency requirements for measuring instruments					
a. Is the calibration of those measuring equipments that have an impact on the claimed emission reductions conducted by the project participants at a frequency specified in the applied monitoring methodology and/or the monitoring plan?	VVS	237	According to receipt of Sept. 2010 issued from grid company, the electricity meter of Dapong's MOF (located in Tung-Ho Steel Substation) had been replaced on 08/9/2012. ~~CL 4 According to grid company's record, the Dapong's meter had been replaced on 8/9/2010.~~	CL 4	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			~~Please provide the calibration records of the replaced meter.~~ The new installed electricity meter of Dapong site (S/N: 10940038) had been reviewed; the replaced meter (S/N: 04940025) calibration record, whose calibration period valid till July 2012 had been reviewed as well. Hence this CL was closed.		
b. During verification of a certain monitoring period, has the calibration been delayed and has the calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available)?	VVS	238	~~Pending on CL 2 and CL 4~~ No calibration has been delayed.	Pending	OK.
c. If yes, is the following conservative approach adopted in the calculation of emission reductions?	VVS	238	N/A	OK	OK.
i. Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error;	VVS	238	N/A	OK	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
or					
ii. Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment.	VVS	238	N/A	OK	OK.
d. Has the error has been applied:	VVS	239	-	-	
i. In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed emission reductions?	VVS	239	N/A	OK	OK.
ii. For all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.	VVS	239	N/A	OK	OK.
e. In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, prior to finalizing verification, were the project participants requested to conduct the required calibration have the project participants calculated the emission reductions conservatively using the approach mentioned in item "c" above?	VVS	240	N/A	OK	OK.
f. Is it possible for the project participants to	VVS	241	The MOF should be calibrated in every 8 years period,	~~CL-5~~	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan?			according to monitoring plan and national standard, CNMV46. The calibrator's should be approved by authority, according to national standard. ~~CL 5 Please clarify if the calibration entity of electricity meters in this project is accredited.~~ The calibration entity, TERTEC's accreditation certificate issued by TAF had been verified, and described in MR. Hence this CL was closed.		
g. If no, were the requirements for post registration changes, in section of E of the VVS, followed?	VVS	241	N/A	OK	OK.
h. Does the monitoring methodology or the monitoring plan specify any requirements for calibration frequency for measuring equipments?	VVS	242	Yes. The monitoring plan specifies that the electricity meters are calibrated following Taiwan's national regulation of electricity meter, "Technical Specification for Verification and Inspection of Electricity Meters (CNMV46)". The calibration period is 8 years.	OK	OK.
i. If no, are the equipments calibrated either in accordance with the specifications of the local/national standards, or as per the	VVS	242	N/A	OK	OK.

VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
manufacturer's specification?					
j. If neither local/national standards nor the manufacturer's specification are available, were international standards used?	VVS	242	N/A	OK	OK.
5. Assessment of data and calculation of emission reductions					
a. Were the data and calculations of GHG emission reductions achieved by/resulting from the project activity assessed by the application of the selected approved methodology?	VVS	244	Yes. The net electricity exported to grid had been assessed and calculated according the selected approved methodology ACM0002 (Version 11).	OK	OK.
b. Is a complete set of data for the specified monitoring period is available? (If 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 either raise a CAR for the project participants to comply with the requirements of appendix 1 of the Project standard or submit a request for deviation prior to submitting request for issuance, if appropriate).	VVS	245	~~CAR 1 Since the meter readings on the first day and last day of this monitoring period are not recorded, PP estimates the electricity import (EGi,y) and export (EGe,y) in the first 25 days and last 6 days by multiplying the days with daily average electricity import/export of relevant transacted month. The conservativeness of this approach has not been justified.~~ The verification team has verified the relevant records and checked the calculation process and considered that the revised approach is conservative. Hence this CAR was closed.	CAR-1	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVS	245	The values indicated in the MR and ER spreadsheet are cross-checked with the MRR and ETNs (receipts) and found consistent. ~~CL 6 PP is requested to provide a clarification for differences in electricity import of Chunan site between PP's meter reading records and Taipower's Electricity Transaction Notes (receipts)~~ PP clarified that the discrepancy arise from the inevitable manual errors when reading the mechanical electricity meter in Chunan site. The reading result of Chunan meter consists of two parts, the integer part contains certain digits (direct readings) and the decimal part contains uncertain digit (approximate readings), therefore the difference between the two records are only the multiples of 800 considering that the magnification factor of the meter is 8000. The verification team is of the opinion that the explanation provided by the PP is reasonable and conservative approach has been adopted. Hence this CL was closed.	CL-6	OK.
d. Have calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in	VVS	245	Yes. The calculation of baseline emissions, project emissions and leakage has been carried out in accordance with	OK	OK.



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the monitoring plan and the applied methodology document?			monitoring plan and the applied methodology document.		
e. Have any assumptions used in emission calculations been justified?	VVS	245	No. There is no assumption in emission calculations.	OK	OK.
f. Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	VVS	245	Yes. The emission factor in the MR is 0.714 tCO ₂ /MWh, which is the same as described in the registered PDD.	OK	OK.

**Table 2 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	Summary of project participant response	Verification team conclusion
CAR 1 Since the meter readings on the first day and last day of this monitoring period are not recorded, PP estimates the electricity import (EGi,y) and export (EGe,y) in the first 25 days and last 6 days by multiplying the days with daily average electricity import/export of relevant transacted month. The conservativeness of this approach has not been justified.	Table 1 5.b	The calculation approach has been revised. For electricity export, the results of daily average electricity export of relevant transacted month multiplied by certain days (25 days in the first month and 6 days in the last month) have been cross-checked with Turbine Generation Continuous Measurement Records, and the lower values of which have been adopted in the ER calculation. For electricity import, the whole month consumption of the first and last transacted months have been adopted in the ER calculation.	The verification team has verified the relevant evidence and checked the calculation process and considered that the revised approach is conservative. Hence this CAR was closed.
CL 1 Please clarify the relationship between project owner and operation entity/organization.	Table1 1.c	Macquarie International Infrastructure Fund Limited (MIIF), an Asia-focused listed infrastructure owner and operator of private infrastructure businesses, owns 100 percent of the project development company Miaoli Wind Co., Ltd (Miaoli Wind). Miaoli Wind sub-contracts Solvent for turbine service and maintenance. The relationship between MIIF	The relationship between MIIF, Miaoli Wind Co., Ltd. and Solvent Co., Ltd. is included in MR. The maintenance work carrying out by Solvent had been verified during this on-site visit. Hence this CL was closed.



Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		and Miaoli can be found in section A.2 of the PDD. It has also been added to the revised MR under section 1 Report Purpose and Project Background. The relationship between MIIF, Miaoli, and Solvent is included in the revised MR under Section 5 Roles and Responsibilities.	
CL 2 Please clarify if the electricity meters were replaced during this monitoring period, since the MOF card (ETN) recorded different S/N.	Table1 3.c.ii	The Dapong meter 04940025 was replaced with meter 10940038 on September 8, 2010. The Chunan meter 68940058 was consistent in this monitoring period. Meter numbers have been added to the revised MR under section 4.3 Project Electricity Generation and Usage. Calibration records for meters 10940038 and 69040058 have already been provided to DOE. The calibration record for meter 04940025 is provided to DOE as well. For Chunan, the incorrect meter serial number 04940006 was written on the consumption meter readings until 07/28/2011, when a Taipower employee corrected the mistake. In a written statement from Taipower dating 17/01/2013, Taipower explained the mistake and stated that the meter readings were still attributed to the correct account. This has been	The S/N of electricity meters of 2 sites verified on-site are 10940038 for Dapong site, and 68940058 for Chunan site. The calibration record of 10940038 (installed on 08/09/2010) had been verified. The written mistake of Chunan site by grid company had been clarified with written statement issued by grid company on 17/01/2013 /21/. Hence this CL was closed.



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		added to section 4.3 Project Electricity Generation and Usage under the heading Calibration.	
CL 3 Please clarify if any internal audit of data quality assurance and quality control had been conducted according to the monitoring plan of registered PDD.	Table1 3.f	Meter reading records are crosschecked with the electricity receipts. The electricity meters will undergo maintenance/calibration according to Taiwan national standards (based on The Weight and Measures Act, Regulation no. CNMV 46, 'Technical Specification for Verification and Inspection of Electricity Meters'). Accordingly, meter calibration is conducted every 8 years period. In addition, electricity receipt is kept for cross reference as per ACM0002. Furthermore, Hal Falls, the qualified electrical technician, periodically reviews the data from Taipower. He sends monthly reports to Taipower and MIIF comprising electricity generation performance. This has been added to the revised MR section 5 Roles and Responsibilities.	The QA/QC procedure and reviewed results, including monthly report from Operation Manager, Mr. Hal Falls, to MIIF, had been verified during this on-site visit. Hence this CL was closed.
CL 4 According to grid company's record, the Dapong's meter had been replaced on 8/9/2010. Please provide the calibration records of the replaced meter.	Table 4.a.	Dapong meter 04940025 was replaced on 8/9/2010. The calibration record is provided to DOE.	The new installed electricity meter of Dapong site (S/N: 10940038) had been reviewed; the replaced meter (S/N: 04940025) calibration record,



Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
			whose calibration period valid till July 2012 had been reviewed as well. Hence this CL was closed.
CL 5 Please clarify if the calibration entity of electricity meters in this project is accredited.	Table 4.f	Taiwan Electric Research and Testing Center No. 1329 (TERTEC), is responsible for calibrating the electricity meters. They are accredited by the Taiwan Accreditation Foundation (TAF), the only national accreditation body in Taiwan. TERTEC accreditation criteria are ISO/IEC 17025:2005. TERTEC were originally accredited 15/11/2004 and their current accreditation certification is effective from 15/11/2010 to 14/11/2013. This information has been included in the revised MR section 4.3 Project Electricity Generation and Usage.	The calibration entity, TERTEC's accreditation certificate issued by TAF had been verified, and described in MR. Hence this CL was closed.
CL 6 PP is requested to provide a clarification for differences in electricity import of Chunan site between PP's meter reading records and Taipower's Electricity Transaction Notes (receipts)	Table 1 5.c	A discrepancy of Chunan consumption data (EGi) exists between the meter readings and the receipt provided by Taipower (TPC) for cross-check purposes. This difference arises because Chunan wind farm still uses the mechanical type meter instead of the smart meter. The manual meter reading can only read the smallest number in units digit so the difference	PP clarified that the discrepancy arise from the inevitable manual errors when reading the mechanical electricity meter in Chunan site. The reading result of Chunan meter consists of two parts, the integer part contains certain digits (direct readings)



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		in reading the electricity consumption is inevitable. The difference between PP's records and Taipower's records all are the multiples of 800 because the meter multiples are 8000. This difference was also recognized by grid company. In long term view, the grid company was also adding additional reading to make up the shortage or overpay. For conservative purposes, when comparing Chunan's consumption meter readings to the receipt, the higher number is used for calculating net electricity.	and the decimal part contains uncertain digit (approximate readings), therefore the difference between the two records are only the multiples of 800 considering that the magnification factor of the meter is 8000. The verification team is of the opinion that the explanation provided by the PP is reasonable and conservative approach has been adopted. Hence this CL was closed.