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# VERIFICATION / CERTIFICATION REPORT

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## JILIN ZHENLAI MALI WIND POWER PROJECT IN CHINA

(UNFCCC Registration Ref. No. 3314)

Verification Period:  
19 July 2010 to 25 April 2011

REPORT No. 2011-9346

REVISION No. 01

DET NORSKE VERITAS



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Recommended for Approval by:	Approved by:	Organisational unit:	
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Client: Carbon Asset Management Sweden AB		Client ref.: Susanne haefeli-Hestvik	

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**Summary:**

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the "Jilin Zhenlai Mali Wind Power Project" (UNFCCC Registration Ref. No. 3314) for the period 19 July 2010 to 25 April 2011.

In our opinion, the GHG emission reductions reported for the "Jilin Zhenlai Mali Wind Power Project" in the monitoring report version 03 of 30 June 2011 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002, version 09 and the monitoring plan contained in the Project Design Document version 03 of 11 December 2009.

DNV Climate Change Services AS is able to certify that the emission reductions from the "Jilin Zhenlai Mali Wind Power Project" during the period 19 July 2010 to 25 April 2011 amount to 85 977 tonnes of CO<sub>2</sub> equivalent.

Report No.: 2011-9346	Subject Group: Environment					
Report title: Jilin Zhenlai Mali Wind Power Project in China						
Work carried out by: Li Yuan Ryan, Gong Zheng Justin, Edwin Aalders						
Work verified by: Tang Zhiang Walter						
Date of this revision: 24 June 2011	Rev. 01	Number of pages: 19				
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	Market Sector					
	Process Industry					

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<b><i>Table of Content</i></b>		<b><i>Page</i></b>
1	INTRODUCTION .....	1
1.1	Objective	1
1.2	Scope	1
1.3	Description of the Project Activity	1
1.4	Methodology for Determining Emission Reductions	2
2	METHODOLOGY.....	2
2.1	Review of Documentation	3
2.2	Site Visit	3
2.3	Reporting of Findings	4
3	VERIFICATION FINDINGS .....	4
3.1	Remaining Issues, CARs, FARs from Previous Validation or Verification	4
3.2	Project Implementation	5
3.3	Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD	5
3.4	Compliance of monitoring plan with monitoring methodology	6
3.5	Compliance of monitoring with the monitoring plan	6
3.5.1	Monitoring parameters	6
3.6	Assessment of data and calculation of emission reductions	10
3.6.1	Baseline emissions	11
3.6.2	Project emissions	12
3.6.3	Leakage	13
3.6.4	Emission reductions	13
3.7	Quality of Evidence to Determine Emission Reductions	13
3.8	Management System and Quality Assurance	14
4	CERTIFICATION STATEMENT.....	16
5	REFERENCES.....	17
Appendix A Corrective action requests, clarification requests and forward action requests		
Appendix B Curricula vitae of the verification team members		

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
ETN	Electricity Transaction Notes
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NECPG	Northeast China Power Grid
PDD	Project Design Document
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention for Climate Change



## 1 INTRODUCTION

Carbon Asset Management Sweden AB has commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of emission reductions reported for the “Jilin Zhenlai Mali Wind Power Project” (the project) in the period 19 July 2010 to 25 April 2011. This report contains the findings from this verification assignment and a certification statement for the certified mission reductions.

### 1.1 Objective

Verification is the periodic independent review and *ex-post* determination by the Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of a registered CDM project activity during a defined verification period.

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

The objective of this verification was to verify and certify emission reductions of the report “Jilin Zhenlai Mali Wind Power Project” for the period 19 July 2010 to 25 April 2011.

### 1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

### 1.3 Description of the Project Activity

Project Parties:	China (Host Party) and Sweden (Annex I Party)
Title of project activity:	Jilin Zhenlai Mali Wind Power Project
UNFCCC registration No:	3314
Baseline and monitoring methodology	ACM0002, version 09, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”
Project Entity:	Jilin Huaneng Renewable Energy Co., Ltd. (China) and Carbon Asset Management Sweden AB (Sweden)
Location of the project activity:	Zhenlai County, Baicheng City, Jilin Province of China.



## VERIFICATION / CERTIFICATION REPORT

Project's crediting period: 19 July 2010 to 18 July 2017 (Renewable)

Period verified in this verification: 19 July 2010 to 25 April 2011

## 1.4 Methodology for Determining Emission Reductions

According to the applied methodology ACM0002, version 09 /21/, the emission reductions are determined as the difference between baseline emissions and project emissions and leakage:

$$ER_y = BE_y - PE_y - L_y$$

Hereinto,  $PE_y$  and  $L_y$  is considered to be zero as per the methodology. Thus, the emission reductions are accounted as follows:

$$ER_y = BE_y = EG_y * EF_y.$$

Where,

$EF_y$  is the emission factor of the grid (tCO<sub>2</sub> /MWh), which was determined and validated *ex-ante* and will not be updated during the first crediting period. And  $EF_y$  of the proposed project in the revised and approved monitoring plan is 1.143775 tCO<sub>2</sub>/MWh /2/.

$EG_y$  is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the imported electricity from the grid on a monthly basis by monitoring the electricity exported and imported.

## 2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- i) Review of project documentation;
- ii) The net electricity supplied by the project to the Northeast China Power Grid (NECPG) which is multiplied with a fixed grid baseline combined emission factor of 1.143775 tCO<sub>2</sub>e/MWh /2/;
- iii) The actual installed capacity of the wind power plant to ensure the conformance with the descriptions in the registered PDD /2/.

**Verification team**

<b>Role</b>	<b>Last Name</b>	<b>First Name</b>	<b>Country</b>	<b>Type of involvement</b>					
				Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Verifier)	Gong	Zheng	China	✓		✓	✓		✓
Verifier	Li	Yuan	China	✓	✓	✓			✓
Observer	Aalders	Edwin	Norway	✓	✓				
Technical reviewer	Tang	Zhiang	China					✓	✓

**Duration of verification**

Monitoring report publication

6 May 2010

Preparations:

From 6 May 2011 to 22 May 2011

On-site verification:

From 23 May 2011 to 25 May 2011

Reporting, calculation checks and QA/QC: From 25 May 2011 to 24 June 2011

**2.1 Review of Documentation**

The emission reduction calculations provided in a spreadsheet /5/, monthly statistics form of electricity exported and imported /6/ /7/, electricity receipt /8/ /9/ and original data records /10/ /11/ were assessed as a part of the verification. The registered Project Design Document (PDD) /2/, in particular the monitoring plan section /1/, and the project validation report /4/ are also reviewed. The monitoring report of version 01 dated 3 May 2011 has been made publicly available on the CDM website.

After reviewing the Monitoring Report, version 03 dated 30 June 2011, DNV issued this verification report and opinion.

**2.2 Site Visit**

During 23 to 25 May 2011, CDM verifier Li Yuan Ryan and Aalders Edwin from DNV have carried out an on-site audit at the “Jilin Zhenlai Mali Wind Power Project” in Zhenlai County, Baicheng City, Jilin Province of China. The key personnel of the project was interviewed or assisted the verification team during the verification and the actual implementation of the project as described in the registered PDD /2/ was verified, which included confirming the operational stages of the project with physical and documented evidences. The interview topics involved:

- Implementation of the project;
- Installed equipments and their operations;
- Monitoring data, monitored method and their information flow;

VERIFICATION / CERTIFICATION REPORT

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- Monitoring system management;
- Data uncertainty;
- ER calculations; and
- Environmental impacts.

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

In addition, all parameters required by the monitoring methodology ACM0002, version 09, and the management system were assessed during the site visit.

### 2.3 Reporting of Findings

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

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

Findings established during the verification as follows:

One clarification request (CL) is raised for the backup meter information in the monitoring plan.

One forward action request (FAR) is issued for correction on electronic format of all the original data record in the next monitoring period.

## 3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Jilin Zhenlai Mali Wind Power Project” for the period 19 July 2010 to 25 April 2011.

### 3.1 Remaining Issues, CARs, FARs from Previous Validation or Verification

No remaining issues were identified in the validation report /4/. This is the first monitoring period, so there is no remaining issues, CARs, FARs from previous verification.



### 3.2 Project Implementation

As part of the site visit, DNV was able to confirm that the project implementation is in accordance with the project description contained in registered PDD of 11 December 2009 /2/. The project is a wind power plant, located at Zhenlai County, Baicheng City, Jilin Province of China.

All facilities and equipments as described in the PDD /2/ have been installed. The project was implemented and commissioned on 29 December 2009 /19/, prior to its CDM registration on 19 July 2010, hence, only the emission reductions occurred after this date can be claimed. The selected monitoring period 19 July 2010 to 25 April 2011 is within the first crediting period of 19 July 2010 to 18 July 2017.

In this monitoring period, the project activity involved implementation and operation of a 49.5 MW wind power project that comprises 33 turbines with 1.5 MW of capacity each (Type: 77/1500). The project is grid connected to East Inner Mongolia Power Co., Ltd on behalf of the NECPG as per the signed PPA /13/.

The main electricity meter and the backup electricity meter have been installed at power plant site, both of which are bidirectional type with 0.2S accuracy /16/. DNV has verified the accuracy level of the meters on site is 0.2S, which is better than the accuracy of the meters stated in the registered PDD (0.5S or above) /2/, it is thus able to be confirmed by DNV that the accuracy of the meters are acceptable during this monitoring period from 19 July 2010 to 25 April 2011. All meters are locked to guarantee the integrity of the instruments.

In this monitoring period, the net generated electricity of 75 169.36 MWh was supplied to the grid during the monitored period 19 July 2010 to 25 April 2011. The emission reductions in the monitored period (19 July 2010 to 25 April 2011) is 85 977 tCO<sub>2</sub>. Considering the wind resource fluctuation, DNV is thus able to verify that this actual net generated electricity is reasonable and acceptable.

The CDM relevant procedures, which include monitoring, recording and reporting, are introduced by Jilin Huaneng Renewable Energy Co., Ltd. /18/, and their implementation was verified by interview the key operators and observing the operations on site.

DNV verified that the project is fully implemented according to the description in the registered PDD /2/. The verification team confirmed through visual inspection and document review that all physical features of the proposed CDM project activity including data collection systems and storage systems have been implemented in accordance with the registered PDD. And DNV confirmed during the on-site visit that the CDM project is completely operational and neither a notification nor request for approval of changes has been requested to CDM Executive Board.

### 3.3 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

The emissions reductions reported in this monitoring period are 85 977 tonnes of CO<sub>2</sub> equivalents in the period from 19 July 2010 to 25 April 2011 (i.e. 281 days). The yearly expected emission reductions in the registered PDD are 116 317 tonnes of CO<sub>2</sub> equivalents, which correspond to the emission reductions of 89 548 tonnes of CO<sub>2</sub> equivalents in 281(116 317\*281/365=89 548) days, and hence the reported emission reductions are considerably lower than the expected. The variation is deemed to be within a reasonable range due to the




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 VERIFICATION / CERTIFICATION REPORT
 

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low stabilization of the wind resources in the proposed project area.

DNV was able to confirm that there are no other differences between the monitoring report version 03 of 30 June 2011 and the registered PDD version 03 of 11 December 2009.

### 3.4 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the registered PDD of 11 December 2009 /2/ is in accordance with the approved methodology applied by the project activity, i.e. ACM0002, version 09, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /21/.

### 3.5 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD of 11 December 2009 /2/.

All parameters stated in the validated monitoring plan are monitored and reported appropriately. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, to recording, calculation and reporting) for these parameters is provided in the monitoring report. The information flow for the each parameter is further verified in the following. DNV confirms that neither a revision nor a deviation to the monitoring plan has been requested to CDM Executive Board.

#### 3.5.1 Monitoring parameters

The monitoring plan indicated in the registered PDD /2/ requires only the monitoring of net electricity supplied to the NECPG. According to the registered PDD /2/ and the monitoring plan /1/, the emission factor of the project is determined to be fixed *ex-ante* as 1.143775 tCO<sub>2</sub>e/MWh for the first crediting period.

The meters installed at the power plant site for monitoring the electricity supplied to and imported from the grid as per the registered PDD /2/.

The responsible person from the wind farm plant will record the data of electricity exports and electricity imports at 00:00 of 25<sup>th</sup> for export electricity and 20<sup>th</sup> for import electricity monthly.

The data will be verified by another data inspector from the power plant and the supervision staff in the substation who is acting on behalf of the grid company. All the data are then cross checked through the monthly sales receipts for electricity exports /8/ and monthly receipts for electricity imports /9/, both of which were issued by the grid company and the power plant. All original records and receipts /6/ /7/ /8/ /9/ /10/ /11/ have been verified by DNV during the site visit. DNV was able to verify the calculations and deemed that the conclusion is transparent and reasonable /5/.

The following table is related to the parameters in the monitoring plan / methodology:

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	EG <sub>out, y</sub> – annual electricity export to NECPG by the Project in year y. EG <sub>in, y</sub> – annual electricity imports from NECPG by the Project for operation. EG <sub>aux, y</sub> – auxiliary electricity imported from NECPG through backup line in emergency



## VERIFICATION / CERTIFICATION REPORT

	situation during operation period in year y.
Measuring frequency:	Continuously measured and reading daily
Reporting frequency:	Monthly reported
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Digital bidirectional energy meters
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	<p>The PDD specifies “The accuracy of the energy meter is 0.5S or above”.</p> <p>The accuracy of the main and backup meter installed at project site are 0.2S which is better than the accuracy (0.5S or above) stated in the registered PDD, the accuracy of the auxiliary meter is 0.5S which is in compliance with that stated in PDD /16/. They are in compliance with local requirement and are the good monitoring practise in China.</p> <p>Thus, the accuracies of the installed meters are acceptable.</p>
Calibration frequency /interval:	The calibration interval is one year.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	<p>The meters will be calibrated once per year as per the registered PDD /2/.</p> <p>The calibration frequency in the monitoring report complies with the JJF 1055-1997 in China /20/ which is consistent with that stated in the calibration report which represent good monitoring practise.</p>
Company performing the calibration:	Jilin Electric Power Research Institute Company Limited which was authorized by Quality and Technical Supervision Bureau of Jilin Province on 31 February 2009, validity to 30 December 2013 /15/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes.
Is(are) calibration(s) valid for the whole reporting period?	<p>Yes.</p> <p><b>Main meter</b>  Meter Type: ZMD402CT44  Accuracy: 0.2S  Serial number: 78040208</p> <p>Calibration certificate: 2009072739 dated 23 July 2009, and 2010080232 dated 6 July 2010 issued by Jilin Electric Power Research Institute Company Limited /16/. The accuracy level is 0.2S in the two calibration certifications.</p>



## VERIFICATION / CERTIFICATION REPORT

DNV

	<p>Validity: In this monitoring period, two calibrations for main meter were performed /16/.</p> <p>The calibration validity: 23 July 2009 to 22 July 2010 for Certification 2009072739; and 6 July 2010 to 5 July 2011 for Certification 2010080232 /16/.</p> <p><b>Backup meter</b>  Meter Type: ZMD402CT44  Accuracy: 0.2S  Serial number: 78040191</p> <p>Calibration certificate: 2009072738 dated 23 July 2009 and 2010080233 dated 6 July 2010 issued by Jilin Electric Power Research Institute Company Limited /16/. The accuracy level is 0.2S in the two calibration certifications.</p> <p>Validity: In this monitoring period, two calibrations for backup meter were performed. The calibration validity: 23 July 2009 to 22 July 2010 for Certification 2009072738; and 6 July 2010 to 5 July 2011 for Certification 2010080233 /16/.</p> <p><b>Auxiliary meter</b>  Meter Type: Digital DSSD71  Accuracy: 0.5S  Serial number: 0600193049</p> <p>Calibration certificate: 200901041 dated 4 January 2009 ; and 201001032 dated 3 January 2010 and 201101023 dated 2 January 2011 issued by Electric Energy Measurement Center of Baicheng City /16/.</p> <p>Validity of cal. Cert: In this monitoring period, three calibrations for auxiliary meter were performed /16/.</p> <p>The calibration validity: 4 January 2009 to 3 January 2010 for Certification 200901041, and 3 January 2010 to 2 January 2011 for Certification 201001032, and 2 January 2011 to 1 January 2012 for Certification 201101023 /16/.</p>
If applicable, has the reported data been	Yes. The original data recorded and electricity



## VERIFICATION / CERTIFICATION REPORT

cross-checked with other available data?	sale receipts from Jilin Huaneng Renewable Energy Co., Ltd. /8/ /9/ /10/ /11/ are used for cross-checked for the data in the monitoring report.
How were the values in the monitoring report verified?	<p>The electricity imported from and exported to grid have been measured continuously and monthly recorded. And the data have been kept at the project site in the paper formats. The designated personnel would read the meter readings, and transcribe them into the daily meter reading on an hourly and daily readings /10/ /11/, the accumulated daily records were transcribed into the monthly statistics on a monthly basis /6/ /7/.</p> <p>According to the PPA /13/, the grid company issues the receipts to project owner for confirmation on electricity purchased from the project and electricity imported from the grid at 00:00 of the last calculated date every month. Both the export and import electricity have been cross-checked with the monthly electricity records /6/ /7/.</p> <p>The cut-off time of the project was verified to be consistent with that in registered PDD during the period 19 July 2010 to 25 April 2011. It was the actual situation and was able to be cross checked with the monthly statistics and electricity sale receipts /6/ /7/ /9/ /8/.</p> <p>For this project, the data in the monthly statistics /6/ /7/ and electricity sale receipts /9/ /8/, after being reviewed by the CDM designated personnel and cross-checked with the monthly reading records /10/ /11/, were used to calculate the emission reductions. During this site visit, all the monthly statics records /6/ /7/ and electricity sale receipts /9/ /8/ during this verification period have been checked by the verification team. Daily reading records were randomly checked for cross reference /10/ /11/.</p> <p>DNV was able to verify the calculating process and the conclusion is transparent and conservative.</p>
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission	The data of electricity exported and imported reported in the monitoring report for selected months were verified by DNV. Reported data matched with the monthly reading records of



## VERIFICATION / CERTIFICATION REPORT

<p>reductions and are necessary QA/QC processes in place?</p>	<p>electricity exports and imports kept at the project power station.</p> <p>Critical parameters used for the determination of the emission reductions are:</p> <ul style="list-style-type: none"> <li>• Monthly statistics transcribed from the original record data /6/ /7/;</li> <li>• Daily readings from the bidirectional meters of electricity exported to and imported from the grid /10/ /11/.</li> <li>• Electricity sales receipts from the Jilin Huaneng Renewable Energy Co., Ltd. and Jilin Power Supply Trade Center for the claimed monitoring period 19 July 2010 to 25 April 2011 /8/ /9/.</li> </ul> <p>All the data is in compliance with the figures stated in the monitoring report.</p> <p>All data in the project site are stored. The monitoring data are stored as a hard copy and would be kept at least for 2 years after the end of the last crediting period.</p> <p>The site visit confirmed that the management system for the CDM project was in place, such as the management structure of the CDM project, CDM training, and the competence criteria of CDM personnel involved in the project. The relevant trainings were organized by the project owner and Carbon Asset Management Sweden AB /18/.</p>
<p>In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?</p>	<p>Not applicable.</p>

### 3.6 Assessment of data and calculation of emission reductions

DNV confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

As stated in the section 1.4, the emission reductions  $ER_y$  by the project activity during the monitoring period is the difference between the baseline emission, project emissions or leakage.




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 VERIFICATION / CERTIFICATION REPORT
 

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$$ER_y = BE_y - PE_y - L_y$$

### 3.6.1 Baseline emissions

Baseline emissions ( $BE_y$  in  $tCO_2$ ) are the product of the baseline emission factor ( $EF_y$  in  $tCO_2/MWh$ ) times the net electricity supplied by the project activity to the grid ( $EG_y$  in MWh).

$EF_y$  is emission factor of the grid, which was calculated *ex-ante* and will not be updated during the first crediting period.  $EF_y$  of the proposed project in the registered PDD is 1.143775  $tCO_2/MWh$ , which has been verified to be correct based on the availability of grid data.

$EG_y$  is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the imported electricity from the grid. The electricity exported to and imported from the grid was derived from the main meter and auxiliary meter in the period 19 July 2010 to 25 April 2011, which was verified by DNV and cross-checked by the sale receipts.

The net electricity supplied by the project to the grid in this reporting period is as shown in the following table.

Electricity supplied to the grid by the project (MWh)

Period	Exported electricity to the grid (MWh)				Period	Imported electricity from the grid (MWh)		
	$EG_{out, y}$					$EG_{in, y}$		
	Values From Meter reading	Values from sales receipts	Verified	PLF		Values from meter reading	Values from sales receipts	Verified
A	B	C= Min(A, B)	%	D	E	F= Max(D, E)		
19/07/2010 to 24/07/2010	454.92	454.92	454.92	6.38	19/07/2010 (00:00-24:00)	1.74	1.74	1.74
25/07/2010 to 24/08/2010	6 016.27	6 020.00	6 016.27	16.33	20/07/2010-19/08/2010	23.76	23.76	23.76
25/08/2010 to 24/09/2010	6 480.88	6 480.00	6 480.00	17.60	20/08/2010-19/09/2010	31.68	31.68	31.68
25/09/2010 to 24/10/2010	9 318.91	9 320.00	9 318.91	26.15	20/09/2010-19/10/2010	18.48	18.48	18.48
25/10/2010 to 24/11/2010	9 743.05	9 740.00	9 740.00	26.45	20/10/2010-19/11/2010	18.48	18.48	18.48
25/11/2010 to 24/12/2010	8 925.76	8 930.00	8 925.76	25.04	20/11/2010-19/12/2010	34.32	34.32	34.32
25/12/2010 to 24/01/2011	6 339.17	6 340.00	6 339.17	17.21	20/12/2010-19/01/2011	23.76	23.76	23.76
25/1/2011 to	4 898.86	4 900.00	4 898.86	14.72	20/01/2011-	66.00	66.00	66.00



## VERIFICATION / CERTIFICATION REPORT

22/02/2011					19/02/2011			
23/02/2011 to 24/03/2011	9 284.11	9 280.00	9 280.00	26.04	20/02/2011- 19/03/2011	13.20	13.20	13.20
25/03/2011 to 24/04/2011 (24:00)	13 982.42	13 980.00	13 980.00	37.96	20/03/2011- 19/04/2011	10.56	10.56	10.56
-	-	-	-	-	20/04/2011- 19/05/2011	15.84	15.84	15.84
Total	75 444.36	75 444.92	75 485.52	22.61 average-	Total	257.82	257.82	257.82

The last calculated time 24:00 of 24 April 2011 equals 00:00 of 25 April 2011 which is consistent with monitoring period 19 July 2010 to 25 April 2011.

Period	Electricity imported from the backup line (MWh)		
	EG <sub>aux, y</sub>		
	Values From Meter reading	Values from sales receipts	Verified
	H	I	J= Max(A, B)
19/07/2010 to 24/07/2010	0.10	0.10	0.10
25/07/2010 to 24/08/2010	0.51	0.51	0.51
25/08/2010 to 24/09/2010	0.53	0.53	0.53
25/09/2010 to 224/10/2010	0.51	0.51	0.51
25/10/2010 to 24/11/2010	0.54	0.54	0.54
25/11/2010 to 24/12/2010	2.40	2.40	2.40
25/12/2010 to 24/01/2011	0.55	0.55	0.55
25/1/2011 to 22/02/2011	0.54	0.54	0.54
23/02/2011 to 24/03/2011	0.48	0.48	0.48
25/03/2011 to 24/04/2011	0.53	0.53	0.53
Total	6.70	6.70	6.70

Hence,

$$EG_y = EG_{out, y} - EG_{in, y} - EG_{aux, y} = 75\,169.36 \text{ MWh, and}$$

$$BE_y = EF_y * EG_y = 85\,977 \text{ tCO}_2\text{e}$$

### 3.6.2 Project emissions

The project emissions are regarded as zero according to the methodology ACM0002.



### 3.6.3 Leakage

There are no leakages that need to be considered in applying the methodology ACM0002.

### 3.6.4 Emission reductions

Therefore, the emission reductions in this monitoring period are:

$$ER_y = BE_y - PE_y - L_y = 85\,977 - 0 - 0 = 85\,977 \text{ tCO}_2\text{e.}$$

The electricity exported to and imported from the grid was derived from the main meter and auxiliary meter in the period 19 July 2010 to 25 April 2011 which was confirmed by DNV. DNV was able to verify meter readings from the original data records /10/ /11/, and therefore confirm the calculation process is transparent and reasonable.

Furthermore, on comparison of data regarding the power exported to the grid as recorded through meter readings, the lower of the values between the receipt and monthly statistic form have been used for calculating the CERs /6/-/9/, which is deemed conservative. Similarly, on comparing the power imported from grid as recorded through meter readings, the higher of the values between the receipt and monthly statistic form have been used for calculating CERs /6/-/9/, which also is deemed conservative. DNV was able to verify the calculating process and conclusion to be transparent /5/.

All the reported and verified data were found to be consistent, i.e. data in the monitoring report version 03 dated 30 June 2011 /1/, original data recorded and electricity sales receipts provided by Jilin Huaneng Renewable Energy Co., Ltd. /9/ /10/, and electricity purchase receipts provided by Jilin Huaneng Renewable Energy Co., Ltd. /8/. It has been verified by DNV on site that the data are complete for the whole monitoring period. And these evidences enable DNV to verify that the net amount of electricity generation is 75 169.36 MWh and the resulting emission reductions are 85 977 tCO<sub>2</sub>e /5/. The net amount of electricity generation and the resulting emission reductions are correctly reported in the monitoring report /1/.

According to the registered PDD, the *ex-ante* estimated average annual emission reductions are 116 317 tCO<sub>2</sub>e. This monitoring period 19 July 2010 to 25 April 2011 covers 281 days, therefore the *ex-ante* estimated emission reductions should be 89 548 tCO<sub>2</sub>e (116 317\*281/365=89 548), which is 4% higher than the real emission reduction 85 977 tCO<sub>2</sub>e. According to the table above, the average plant load factor of this monitoring period is 22.61% which is lower than the plant load factor 23.47% in the registered PDD. According to the FSR /3/, the plant load factor of 19 July 2010 to 24 July 2010 is low (6.38%) which is due to the poor wind resources during these five days; In October, November and December of 2010 and March, April of 2011, the plant load factor is higher than the 23.47% in the registered PDD, which is due to the rich wind resources in these several months. DNV confirmed that the PLF reflection is reasonable.

As outlines above, the input data for calculating the emission reductions, the calculation process and the result are complete and transparent. Therefore, DNV is able to confirm the accuracy of the emission reductions.

## 3.7 Quality of Evidence to Determine Emission Reductions

DNV confirms that a complete set of data for this monitoring period is available to be monitored and are in accordance with the registered PDD.



## VERIFICATION / CERTIFICATION REPORT

DNV compared the electricity exported and imported data reported in the monitoring report for selected months with monthly statistics forms kept at the project office that were visited /6/ /7/. The reported data matched the monthly statistics records of electricity exported and imported.

Critical parameters used for the determination of the emission reductions are:

- Monthly readings from bidirectional meter of electricity exported to and imported from the grid;
- Hourly and daily readings from reference meter operated and recorded of electricity exported to and imported from the grid at power plant;
- Sales receipts from the Jilin Power Supply Trade Center and Jilin Huaneng Renewable Energy Co., Ltd. for the claimed monitoring period /8/ /9/.

All the data is in compliance with the figures stated in the monitoring report.

The original data were transferred to the emission reductions spreadsheet /5/ and are appended as a reference to this report by Jilin Huaneng Renewable Energy Co., Ltd..

All necessary documentation is collected, referenced and aggregated and is easily accessible in hard-copy. All data will be archived at least for 2 years after the end of the last crediting period. Measurements are performed by calibrated equipment, and the key data can also be cross-checked by daily record in hard-copy. No assumptions are used that have any material influence on reported emission reductions.

### 3.8 Management System and Quality Assurance

Jilin Huaneng Renewable Energy Co., Ltd. is responsible for the operation and maintenance of the project, the monitoring equipments and data collection. The management system for the project has been verified to be in place by DNV on site. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put into operation.

DNV confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered PDD and monitoring plan.

Data was collected according to the well defined data collection procedures:

- Data of electricity exported and imported are automatically recorded on a daily/hourly basis;
- At the end of every month, Jilin Huaneng Renewable Energy Co., Ltd. issues the generation report which is used to receipt the electricity provided to cross-check with Jilin Power Supply Trade Center;
- Quality of the meter reading is assured through calibration of electricity meters and through cross checking of readings between the records and the receipts;

The monitoring and reporting of electricity data is also in accordance with the well established operational procedures.

All monitoring meters have been calibrated and maintained periodically to ensure the accuracy of measurement. All data has been archived electronically and/or in hard copy and



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**VERIFICATION / CERTIFICATION REPORT**

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was accessible during verification site visit.

The site visit confirmed that the management system for the CDM project is in place, such as the management structure of the CDM project, the CDM project management and CDM training, the operation and maintenance /17/and the competence criteria of CDM personnel involved in the project. The CDM training was organized by the project owner and carried out by Carbon Asset Management Sweden AB at the Jilin Zhenlai Mali Wind Power Project /18/. The new staff will be trained by the experienced staff and Carbon Asset Management Sweden AB, and then get the competence criteria of CDM in the project.



#### 4 CERTIFICATION STATEMENT

*DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the “Jilin Zhenlai Mali Wind Power Project” (UNFCCC Registration Reference No. 3314) for the period 19 July 2010 to 25 April 2011.*

*The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.*

*It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD.*

*DNV conducted the verification on the basis of the monitoring methodology ACM0002, version 09, the monitoring plan contained in the registered Project Design Document version 03 of 11 December 2009 and the monitoring report version 03 dated 30 June 2011. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.*

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

*In our opinion, the GHG emissions reductions of the “Jilin Zhenlai Mali Wind Power Project” (UNFCCC Registration Ref. No. 3314) for the period 19 July 2010 to 25 April 2011 are fairly stated in the monitoring report version 03 dated 30 June 2011.*

*The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, version 09 and the monitoring plan contained in the registered PDD of 11 December 2009 and the monitoring report dated 30 June 2011.*

*DNV Climate Change Services AS is able to certify that the emission reductions from the “Jilin Zhenlai Mali Wind Power Project” during the period 19 July 2010 to 25 April 2011 amount to 85 977 tonnes of CO<sub>2</sub> equivalent.*

*Beijing and Oslo, 24 June 2011*

Gong Zheng Justin  
CDM verifier  
DNV Beijing, China

Technical Director for CDM  
DNV Climate Change Services AS



## 5 REFERENCES

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

- /1/ Carbon Asset Management Sweden AB.: Monitoring Report for “Jilin Zhenlai Mali Wind Power Project”, Monitoring Period: 19 July 2010 to 25 April 2011, version 03 dated 30 June 2011.  
Carbon Asset Management Sweden AB.: Monitoring Report for “Jilin Zhenlai Mali Wind Power Project”, Monitoring Period: 19 July 2010 to 25 April 2011, version 02 dated 24 May 2011.  
Carbon Asset Management Sweden AB.: Monitoring Report for “Jilin Zhenlai Mali Wind Power Project”, Monitoring Period: 19 July 2010 to 25 April 2011, version 01 dated 3 May 2011.
- /2/ Carbon Asset Management Sweden AB.: Project Design Document for “Jilin Zhenlai Mali Wind Power Project”, version 03, dated 11 December 2009.
- /3/ Jilin Electric Power Survey& Design Institute: Feasibility study report of Jilin Zhenlai Mali Wind Power Project dated July 2001.
- /4/ TÜV NORD CERT GmbH, Validation Report of “Jilin Zhenlai Mali Wind Power Project”, Report No. 8000371973-09/191, dated 8 February 2010.
- /5/ Carbon Asset Management Sweden AB: Spreadsheet for calculation of emission reductions of Jilin Zhenlai Mali Wind Power Project from 19 July 2010 to 25 April 2011, version 03, dated 30 June 2011.
- /6/ Monthly statistics form of electricity exported from 19 July 2010 to 25 April 2011 issued by Jilin Huaneng Renewable Energy Co., Ltd..
- /7/ Monthly statistics form of electricity imported from 19 July 2010 to 25 April 2011 issued by Jilin Huaneng Renewable Energy Co., Ltd..
- /8/ Electricity Purchase receipts issued by Jilin Power Supply Trade Center and Jilin Huaneng Renewable Energy Co., Ltd. during the period 19 July 2010 to 25 April 2011.
- /9/ Electricity Sales receipts to Jilin Power Supply Trade Center issued by Jilin Huaneng Renewable Energy Co., Ltd.and Jilin Power Supply Trade Center during the monitoring period 19 July 2010 to 25 April 2011.
- /10/ Jilin Huaneng Renewable Energy Co., Ltd.: Original data record of electricity exported to the grid company from 19 July 2010 to 25 April 2011.
- /11/ Jilin Huaneng Renewable Energy Co., Ltd.: Original data record of electricity imported from the grid company from 19 July 2010 to 25 April 2011.
- /12/ Jilin Huaneng Renewable Energy Co., Ltd.: “CDM Project Management and Operation Procedure” issued in November 2009.
- /13/ Power Purchase Agreement signed between Jilin Huaneng Renewable Energy Co., Ltd. with East Inner Mongolia Power Co., Ltd on 19 April 2011.
- /14/ The construction joint inspection report was in implementation and organized by Huaneng Jilin Power Co., Ltd dated 24 March 2010.



## VERIFICATION / CERTIFICATION REPORT

- /15/ Calibration body: Jilin Electric Power Research Institute Company Limited, which was authorized by the Quality and Technical Supervision Bureau of Jilin Province on 31 February 2009, validity to 30 December 2013;  
Calibration body: Electric Energy Measurement Center of Baicheng City, which was authorized by the Quality and Technical Supervision Bureau of Jilin Province on 31 July 2005, validity to 31 December 2013.
- /16/ The calibration reports for the main meter issued by Jilin Electric Power Research Institute Company Limited, Certificate No. 2009072739 dated 23 July 2009, valid from 23 July 2009 to 22 July 2010.  
The calibration reports for the main meter issued by Jilin Electric Power Research Institute Company Limited, Certificate No. 2010080232 dated 6 July 2010, valid from 6 July 2010 to 5 July 2011.  
The calibration reports for the backup meter issued by Jilin Electric Power Research Institute Company Limited, Certificate No. 2009072738 dated 23 July 2009, valid from 23 July 2009 to 22 July 2010.  
The calibration reports for the backup meter issued by Jilin Electric Power Research Institute Company Limited, Certificate No. 2010080233 dated 6 July 2010, valid from 6 July 2010 to 5 July 2011.  
The calibration reports for the auxiliary meter issued by Electric Energy Measurement Center of Baicheng City, Certificate No. 200901041 dated 4 January 2009, valid from 4 January 2009 to 3 January 2010.  
The calibration reports for the auxiliary meter issued by Electric Energy Measurement Center of Baicheng City, Certificate No. 201001032 dated 3 January 2010, valid from 3 January 2010 to 2 January 2011.  
The calibration reports for the auxiliary meter issued by Electric Energy Measurement Center of Baicheng City, Certificate No. 201101023 dated 2 January 2011, valid from 2 January 2011 to 1 January 2012.
- /17/ Jilin Huaneng Renewable Energy Co., Ltd.: The operation and maintenance record for wind turbines from 19 July 2010 to 25 April 2011.
- /18/ Jilin Huaneng Renewable Energy Co., Ltd.: CDM Training record for staff of Jilin Zhenlai Mali Wind Power Project.
- /19/ Jilin Huaneng Renewable Energy Co., Ltd.: All the generators commissioned permit, dated 29 December 2009.
- /20/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: Technical Norm of the Calibration of AC Watt-hour Meters at Place of Installation, dated 1 June 1998.

*Background documents related to the design and/or methodologies employed in the design or other reference documents.*

- /21/ CDM Executive Board: Approved Baseline and Monitoring methodology ACM0002, version 09, Consolidated baseline methodology for grid-connected electricity generation from renewable sources.
- /22/ CDM Executive Board: Validation and Verification Manual, Version 1.2.

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



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VERIFICATION / CERTIFICATION REPORT

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- /23/ Mr. Qin Yuzhi, Deputy factory director;  
Mr. Wang Xiangdong, Supervisor;  
Mr. Shi Shaohui, Supervisor;  
Mr. Li Xin, Supervisor; Jilin Huaneng Renewable Energy Co., Ltd.  
Mr. Yang Jiageng, Project Manager;  
Mr. Long Haisheng, Director;  
Mr. Song Haisong, Deputy Director;
- /24/ Ms. Lin Shunrong, Project Manager Carbon Asset Management Sweden AB
- /25/ Ms. Zhu Na, Senior Project Manager Sinocarbon Innovation & Investment Co., Ltd

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## **APPENDIX A**

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### **CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS**

**Corrective action requests**

<b>CAR ID</b>	<b>Corrective action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
<i>N/A</i>	<i>No CAR was issued.</i>	<i>N/A</i>	<i>N/A</i>

**Clarification requests**

<b>CL ID</b>	<b>Clarification request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
CL 1	Clarification is sought for the accuracy, calibration report, serial number and other relevant information of the backup meter in the monitoring report of the proposed project.	More information of backup meter is supplement in section D.2. Calibration report of backup meter will be provided for checking.	The information of backup meter was added in the revised MR version 03 date 30 June 2011 which was verified to be consistent with registered PDD version 03 11 December 2009. The relevant evidences (calibration reports) for backup meter were reviewed on site by DNV which was deemed to be reasonable and acceptable. CL 1 is closed.

**Forward action requests from previous verification**

<b>FAR ID</b>	<b>Forward action request</b>	<b>Summary of how FAR has been addressed in this reporting period</b>	<b>Assessment of how FAR has been addressed</b>
<i>N/A</i>	<i>No FAR was issued.</i>	<i>N/A</i>	<i>N/A</i>

**Forward action requests from this verification**

<b>FAR ID</b>	<b>Forward action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
FAR 1	According to the monitoring plan, data management section of the registered PDD (version 03 dated 11 December 2009), all monitoring data and records will be archived in electronic format as well as on paper. During site visit from 23 May to 25 May 2011, all the monitoring data and records only have paper format which is not consistent with the registered PDD which should be taken corrective action in the next period verification.	The project owner will supplement electronic monitoring data strictly consistent with paper record. In the following monitoring period, both electronic and paper format of monitoring record will be prepared for checking and kept during the crediting period and two years after.	According to clarification of this FAR, DNV was able to confirm that FAR1 has no effect on the certified emission reduction of CO <sub>2</sub> in the first verification period which is acceptable. This FAR will be assessed in the 2 <sup>nd</sup> verification period.

## **APPENDIX B**

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### **CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS**

### ***Gong Zheng***

***Gong Zheng, Justin:*** holds a Bachelor and a Master Degree in Chemical Engineering. Having an overall experience of around five years. Prior to joining DNV, having more than three years experience in project operation and pre-planning experience in the operation of energy plants and he was involved in energy design and supply. His experience also covers the fields of project management and cleaner production in chemical industries.

He has experience of around 2 years in validation and verification of numerous CDM projects in DNV. All these projects are located in China.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in “Energy Generation from Renewable Energy Sources”.

### ***Li Yuan, Ryan***

***Li Yuan, Ryan:*** holds a Master Degree in Environmental Engineering from Chinese Academic of Sciences. Having an overall experience of more than 3 years. Prior to joining DNV, having 2 years experience in Health Safety & Environment industry covering management of domestic wastewater treatment plant and solid waste disposal.

In addition, He has also been actively involved in implementation of Management Systems such as ISO9000, ISO 140001 and OHSAS 18001 standards during working abroad.

He has experience of more than one year in validation and verification of numerous CDM projects in China.

His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in “Waste Handling and Disposal”.

### ***Tang Zhiang, Walter***

***Mr. Tang Zhian:*** Walter holds a Bachelor Degree in Thermodynamic Engineering and a Master Degree in Business Administration. Having an overall experience of around twelve years. Prior to joining DNV, having around 5 years in the field of power industry covering of consulting and engineering for thermal power, wind power, hydropower and solar energy projects. His experience also covers the field of space industry for thermal design, the energy analysis and thermal control for about 4 years. He has gained the relevant financial and investment knowledge through his courses in MBA. He has applied his financial and investment knowledge in his consulting work for the power industry, such as investment risk analysis, financial accounting, investment parameters assessment, etc.

He has experience of more than 3 years in validation and verification of numerous CDM, VCS and GS projects in DNV both in China and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in “Energy Generation from Renewable Energy Sources”.

## *Edwin Aalders*

**Mr Edwin Aalders:** 15 years of experience as an assessor in Environmental Auditing and accreditation and in the development of new environmental certification & control services. Throughout his career Mr Aalders has lived and worked throughout the developing and developed countries and in particular Latin America, Africa and Australasia. He has been involved and responsible for developing new environmental markets and programmes such as Carbon Offset Verification Services for SGS, Marine Stewardship Council (MSC), Organic, GLOBALGAP and Forest Stewardship Council (FSC) Programme.

In 2004 he became the Director of the International Emission Trading Association (IETA) which he held till 2009. During his time in IETA, he was been responsible for the UNFCCC process such as the CDM & JI as well as the voluntary market and the ultimate set up of the VCSa. In addition to his role as Director in IETA he held between November 2007 and October 2008 the role of Acting CEO for the Voluntary Carbon Standard Association (VCSa). After leaving IETA Mr Aalders became a Partner with IDEAcarbon before joining DNV as Principal Engineer at the Climate Change and Sustainable Development Department in 2011. Mr Aalders is an elected member of roster of experts for the Methodology & Accreditation Panel Expert of the CDM & JI.