

# Verification Report

## Forth periodic verification

Report for:

Japan Carbon Finance Ltd.

Verification of JI project for  
Kaliakra Wind Power Project  
(Ref No: BG 1000155)

Monitoring Period:  
01/01/2012 to 30/11/2012

LRQA Reference	: SOF 6010089/0004 version 2
Date	: 07/12/ 2012
Work carried out by	: Lyubka Marinova
Work verified by	: Javier Vallejo Drehs

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## 1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Japan Carbon Finance Ltd., representing the project participants (PP), to undertake the forth periodic verification of the determined under Bulgarian Track 1 procedure project activity "Kaliakra Wind Power Project" project reference number BG 1000155 covering the monitoring period from 01/01/2012 to 30/11/2012. The verification has been performed by document review based on the Monitoring Report Version 01 dated 03/12/2012, on-site assessment, and interviews with the stakeholders and resolution of outstanding issues and issuance of the verification report.

The project intends to reduce greenhouse gas (GHG) emissions by construction and operation of 35 aerial wind turbines and associated facilities with overall capacity of 35 MW and the provision of the generated electricity to the Bulgarian power grid.

The fulfilment of the requirements as set forth in the Article 6 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the JI Guidelines and relevant decisions of the Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Supervisory Committee of the JI (JISC) as well as the Bulgarian JI Track 1 procedure has been evaluated and the conformance to the verification requirements were confirmed based on the given information. A risk based approach was taken to conduct the verification and corrective action requests (CARs), clarifications (CLs) and forward action requests (FARs) were issued for relevant actions by the PP.

The verification team identified, through the verification process, no CARs/CLs. The verification team, through the verification process, confirmed that the emission reductions achieved by the project activity during the monitoring period are correctly calculated in the monitoring report Version 02 dated 06/12/2012 based on the approved monitoring methodology and the monitoring plan of the determined PDD. Therefore, LRQA determined that the reductions in anthropogenic emissions amount to 62,595 tCO<sub>2</sub>e and requests the Executive Environmental Agency to deem this verification final for ERUs issuance.

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## Abbreviations

CAR	Corrective action request
CL	Clarification
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
ERs	Emission reductions
ERU	Emission Reduction Unit
FAR	Forward action request
GHG	Greenhouse gas
IPCC	Intergovernmental panel on climate change
JI	Joint Implementation Mechanism
JI DVM	Joint Implementation Determination and Verification Manual
JI-G	Joint Implementation Guidelines (Decision 9/CMP.1)
JISC	Joint Implementation Supervisory Committee
JI-SSC	Small Scale JI projects
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
KWP	Kaliakra Wind Power
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MP	Monitoring Plan
MR	Monitoring Report
MOEW	Ministry of Environment and Water of Bulgaria
NEC	National Electricity Company
PDD	Project design document
PP	Project participant
SCADA	Supervisory Control And Data Acquisition
tCO <sub>2</sub> e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change

## 2 Introduction

The project participant (PP) represented by Japan Carbon Finance Ltd. has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake the third periodic verification of the proposed project "Kaliakra Wind Power Project" covering the monitoring period from 01/01/2012 to 30/11/2012. This report summarises the findings through the verification process that has been conducted on the verification requirements of the JI-G and the host Party for JI Track 1.

The verification has been undertaken by the team formed of the qualified personnel of LRQA as follows.

Lyubka Marinova	LRQA Sofia	Team Leader, JI Verifier, Sector Expert
Javier Vallejo Drehs	LRQA Ltd.	Technical Reviewer, CDM Verifier, Sector Expert, Decision Maker

Personnel being engaged in a JI project verification are qualified based on the established procedures of LRQA to assure the resource requirements that satisfy all the requirements of competence criteria of the JI accreditation standard for Independent Entities. LRQA is an Accredited Independent Entity and holds the full responsibility on decision-making regarding the verification in line with the accreditation requirements of the JISC. The certificate of appointment of the team personnel is attached to this report.

### 2.1 Objective

Through the verification activities, the verification team has to confirm that:

- 1) The project activity has been implemented and operated as described in the determined PDD, and that all physical features of the project activity are in place
- 2) The monitoring report (MR) and other supporting documents provided are complete and verifiable and in line with applicable JI requirements
- 3) Actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan (MP); and
- 4) The data are recorded and stored as per the approach chosen for baseline setting and monitoring.

The verification followed the requirements of the current version of the JI Determination and Verification Manual (JI DVM) to ensure the quality and consistency of the verification work and the report.

### 2.2 Scope

The scope of verification was an independent and objective review of the monitored emission reductions (ERs) against the verification requirements of the JI-G and the host Party for JI Track 1. LRQA followed a risk-based approach in the verification, focusing on the identification of significant risks for implementation of the determined monitoring plan and the resultant emission reductions. The verification statement shall become final on final review by the decision maker of LRQA Ltd.

## 2.3 GHG Project Description

Project title	Kaliakra Wind Power Project
Jl reference	BG 1000155
Date of registration	04/06/2010
Applied methodology	ACM0002 (version 6) Consolidated baseline methodology for grid-connected electricity generation from renewable sources
Crediting period	2008-2012
Project location	Kaliakra cape, Bulgarevo village, Kavarna municipality, Bulgaria
Project participants	Japan Carbon Finance Ltd. Japan Mitsubishi Heavy Industries Ltd. Japan Inos-1 Ltd Bulgaria Kaliakra Wind Power (Project company)
Monitoring period	01/01/2012 – 30/11/2012

## 3 Methodology

### 3.1 Verification approach

LRQA's verification of the project documentation provided by the project participant was based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to LRQA. Qualitative information comprises the information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emission reports and review and internal audit of calculations.

As well as the monitoring documentation provided by the project participants, LRQA also reviewed:

- The determined PDD, including the monitoring plan and the corresponding determination report
- Previous verification reports, if any
- The applied CDM monitoring methodology - ACM0002 (version 6) Consolidated baseline methodology for grid-connected electricity generation from renewable sources,
- Relevant decisions, clarifications and guidance from the CMP and the JISC
- Any other information and references relevant to the project's resulting emissions reductions.

### 3.2 Desk review

The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included:

- A review of data and information presented to verify their completeness
- A review of the MP (In case of approved CDM methodology approach chosen also a review of the CDM monitoring methodology), paying particular attention to the

frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and

- 3) An evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The monitoring report version 01 dated 03/12/2012 was initially reviewed as well as all the supporting information and documents provided by PP. The documents reviewed by LRQA are listed in the Appendix A. Some typo mistakes were detected in the monitoring report in the course of verification and LRQA reviewed the final version of the monitoring report Version 02 dated 06/12/2012 to confirm that all changes were correctly incorporated.

### 3.3 On-site assessment

An on-site assessment was conducted as a part of verification activity and involved:

- 1) An assessment of the implementation and operation of the JI project as per the determined PDD
- 2) A review of information flows for generating, aggregating and reporting of the monitoring parameters
- 3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MP
- 4) A cross-check between information provided in the MR and data from other sources
- 5) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD
- 6) A review of calculations and assumptions made in determining the GHG data and ERs, and
- 7) An identification of QA/QC procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The detail of the on-site assessment is as follows:

Date	Location	Subjects covered	Persons interviewed
03/12/ 2012	Kaliakra Wind Power, Kaliakra cape, Bulgarevo village, Kavarna municipality Bulgaria	Project Boundary issues Physical identification of Wind turbines Metering provisions and calibration Maintenance Training Record keeping Data verification Environmental issues	✓ Vera Trendafilova – Chief Operating Officer ✓ Dimitar Stoev – Plant manager ✓ Ivaylo Ivanov – Substation operator

For details of all the findings of the desk review and site visit, please refer to the Checklist for Verification in Appendix C.

### 3.4 Quality of evidence

When verifying the report emission reduction, LRQA ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data are shown in Appendix A.

When assessing the audit trails, LRQA also examined:

1. Whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period
2. The source and nature of the evidence
3. If comparable information was available from sources other than that used in the monitoring report, LRQA cross-checked the monitoring report against the other sources to confirm that the stated figures were correct. The sources and the data referenced are shown in Appendix A.

LRQA also assessed that the data collection system met the requirements of the monitoring plan.

### 3.5 Resolution of clarification and corrective action requests

LRQA, during this verification, identified no issues related to the monitoring, implementation or operation of the proposed JI project activity that could impair the capacity of the proposed JI project to achieve emission reductions or influence the reporting of emission reductions. Evidence reviewed and conclusions drawn are included in the Checklist for Verification – Appendix C.

LRQA would raise a Corrective Action Request (CAR) if one of the following occurred:

1. Nonconformities with the monitoring plan were found in monitoring and reporting, or if the evidence provided to prove conformity was insufficient
2. Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions, and/or
3. Issues identified in a FAR during determination to be verified during verification have not been resolved by the project participants.

LRQA would raise a Clarification Request (CL) if information was insufficient or not clear enough to determine whether the applicable JI requirements have been met.

In case CARs/CLs were raised and not resolved, ERs cannot be verified and recommended for issuance of ERUs by the DFP of the Host party.

LRQA would raise a Forward Action Request (FAR) during this verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period. FARs do not relate to JI requirements for issuance of ERs achieved during the subject monitoring period.

### 3.6 Internal quality control

The technical review by a qualified person independent from the verification team and a review by an authorised decision maker are conducted before the submission of the verification report to the PP and to the Bulgarian Executive Environmental Agency.

## 4 Verification conclusions

LRQA has undertaken this verification in line with the Checklist for verification (which is based on the Joint Implementation Determination and Verification Manual Version 01-DVM). This section provides an overview of the verification activities and general conclusions. Further details in relation to each element of the DVM and to each finding are shown in the Checklist for Verification – Appendix C.

The Checklist is structured based on the main verification requirements as follows:

- Project approvals by Parties involved



- Project implementation in line with the determined project design document
- Compliance with monitoring plan
- Revision of Monitoring Plan (Applicable if MP is revised by PP)
- Data Management.

#### 4.1 Project approvals by parties involved

LRQA has assessed that the DFP of the Party Japan, other than the host country, and that the DFP of the Party Bulgaria (Host country), have issued an unconditional written project approval in accordance to paragraph 38 of the JI Guidelines.

#### 4.2 Project implementation in accordance with the determined project design document

LRQA has, by means of a desk review and an on-site visit, assessed that all physical features of the JI project activity proposed in the PDD are in place and that the project participants have operated the proposed JI project as per this PDD, regarding which the determination has been deemed final and is so listed on the UNFCCC JI website.

For details of the implementation status of the project, the actual operation of the proposed JI project and any information given in the monitoring report that is different from that stated in this PDD<sup>1</sup>, please refer to the Checklist for Verification in Appendix C.

#### 4.3 Compliance with monitoring plan

LRQA has confirmed that:

1. The monitoring plan has been properly implemented and followed by the project participants
2. All parameters stated in the monitoring plan have been sufficiently monitored and updated as applicable, including:
  - a. Project emission parameters
  - b. Baseline emission parameters
  - c. Leakage parameters
  - d. Management and operational system
3. the accuracy of equipment used for monitoring is in line with the relevant requirements provided by the JISC and is controlled and calibrated in line with the monitoring plan:
  - a. monitoring results are consistently recorded as per approved frequency
  - b. quality assurance and quality control procedures have been applied in line with the monitoring plan

For details relating to this section, please refer to the Verification Checklist in Appendix C.

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<sup>1</sup> And has caused an increase in estimates of the emission reductions in the current monitoring period or is highly likely to increase the estimates of emission reductions in future monitoring periods

LRQA confirms that monitoring has been carried out in line with the monitoring plan contained in the PDD regarding which the determination has been deemed final or accepted revised monitoring plan.

The “Monitoring Parameters and calibration table” in the Checklist for Verification – Appendix C shows each parameter required by the monitoring plan, and clearly states how LRQA has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters, including the values in the monitoring report.

LRQA confirms also that the monitoring period for each component of the JI project is clearly specified in the Monitoring Report in accordance to the PDD, regarding which the determination has been deemed final, and the Monitoring Report does not overlap with other components for which verification were already deemed final in the past.

#### 4.4 Revision of Monitoring Plan

The implemented Monitoring Plan does not need a revision in this stage of the Project implementation and no revised Monitoring Plan has been submitted by PP for this Monitoring period.

#### 4.5 Data Management

LRQA has determined whether:

1. A complete set of data for the specified monitoring period is available
2. The implementation of data collection procedures is in line with the monitoring plan, including the quality control and quality assurance procedures
3. The function of the monitoring equipment, including its calibration status, is in order
4. The evidence and records used for the monitoring are maintained in a traceable manner
5. The data collection and management system for the project is in line with the monitoring plan
6. The calculations of baseline emissions, proposed JI project emissions and leakage, as appropriate, have been carried out in line with the formulae and methods described in the monitoring plan.

For details of whether data were not available because activity levels, or non-activity parameters were not monitored in line with the determined monitoring plan, and for a description of LRQA cross-checked reported data, please refer to the Checklist for Verification in Appendix C.

LRQA confirms that appropriate methods and formulae for calculating baseline emissions, projects emissions and leakage have been followed.

LRQA is of the opinion that all assumptions, emissions factors and default values that were applied in calculations have been justified.

## **5 Making the monitoring report publicly available**

In line with the "Procedures for making the monitoring report available to the public in line with paragraph 32 of the JI Guidelines, the monitoring report Version 01 dated 03/12/2012 was made publicly available on LRQA website at:

<http://www.lr.org/lloyds-register-quality-assurance/management-system-standards-schemes-directives/schemes/CDM-and-JI-projects/KaliakraWindPowerBulgaria.aspx>

As the project is a Track 1 project following the requirements of the Bulgarian Track 1 procedure publication on JI web site is not possible. The requirements of this procedure stipulate that PP have to submit the Monitoring and Verification reports to the Bulgarian Ministry for Environment and Water.

## 6 Verification Opinion

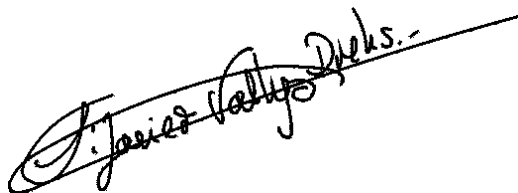
LRQA has undertaken the forth periodic verification of the proposed project activity “Kaliakra Wind Power Project” covering the monitoring period from 01/01/2012 to 30/11/2012 based on the requirements of JI as set out in Article 6 of the Kyoto Protocol, the JI Guidelines, subsequent decisions made by the COP/MOP and JISC, and the other rules applicable to the proposed project including the host country’s legislation and its specific requirements for JI projects approval.

Through the verification process, the verification team identified no CARs/CLs or FARs.

The verification team is of the opinion that the proposed project activity has been implemented in line with the determined PDD, the MP ver 1.2 (rev 1.0) dated 3/12/2009 complies with the relevant rules and regulations for the establishment of Monitoring Plans, the monitoring complies with the MP and the monitored data and calculation of ERs are assessed and confirmed as correct. LRQA confirms that the reductions of anthropogenic emissions generated by sources reported by project participant are accurate and free of material errors, omissions, or misstatements. Use of diesel engine for emergency purposes and related emissions are reported in this verification report and LRQA confirms that using the materiality thresholds defined in the standard for applying the concept of materiality in verifications, this verification opinion is based on a reasonable level of assurance.

Therefore, LRQA hereby issued a positive verification opinion and inform the Executive Environmental Agency and the Bulgarian Ministry for Environment and Water that the reported ERs of “Kaliakra Wind Power Project” during the monitoring period of 01/01/2012 to 30/11/2012 amount to 62,595 tCO<sub>2</sub>e.

### Decision Maker



10/12/2012

Javier Vallejo Drehs

CDM/JI Quality Manager

## 7 Appendices

### 7.1 Appendix A: List of documents reviewed

#### **Category A documents (documents from the PP)**

1	Project Design Document for Kaliakra Wind Power Version 1.2 (rev. 1.0) dated 03/12/2009
2	Determination report for Kaliakra Wind Power Project Revision No 03 dated 14/05/2010 issued by JACO CDM Ltd.
3	Verification report for Third Periodic Verification SOF6010089 version 2 dated 06/04/2012 issued by LRQA Ltd.
4	Letter of approval by Ministry of Environment and Water, Republic of Bulgaria, issued on 15/01/2010
5	Letter of approval by Ministry of Economy, Trade and Industry, Government of Japan issued on 29/01/2010
6	License for electricity production L-206-01 dated 13/07/2006
7	Power Purchase Agreement between KWP and NEC dated March 2007, Annex 1 to it dated 03/08/2010
8	Letter from Power System Operator 312 dated 07/08/2012 for curtailment
9	Semi-annual operations reports No 2011-H1 and internal maintenance records for the period 01/07/2012-30/11/2012
10	Orders for issuing and transfer of guarantees for produced electrical energy for Jan - Oct 2012
11	Wind farm overview (SCADA system) as of 03/12/ 2012
12	Monthly protocols for measured electrical energy supplied to the grid Issued by NEC – Jan 2012-Nov 2012
13	Monthly protocols for measured electrical energy purchased from the grid issued by NEC – Jan 2012 - Nov 2012
14	Comparison of readings between SCADA system and control power meter Jan 2012 – Nov 2012
15	Comparison of power meter readings commercial and control meter Jan 2012 – Nov 2012
16	SCADA system daily records for generated and supplied to the grid electricity Jan 2012 - Nov 2012
17	Monthly generation data annual summary Jan 2012 – Nov 2012
18	NEC's monthly transaction protocol annual summary for supplied to the grid electricity Jan 2012 – Nov 2012
19	NEC's monthly transaction protocol annual summary for purchased electricity Jan 2012 – Nov 2012
20	Manufacturer specification of the diesel generator and records for refuel of diesel generator
21	Diesel fuel characteristics (OMV)
22	Monitoring equipment test reports
23	MP EN_05 Management procedure rev. 02
24	Internal audit records
25	Own monitoring plan for environmental parameters and reports from noise and electromagnetic field measurements
26	Up-dated Project and Equity IRR figures covering real figures for Oct 2012 and budget for Nov, Dec 2012
27	Daily generation reports monthly summary of data from commercial and control

	meters Jan 2012 – Nov 2012
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**Category B documents (other documents referenced)**

1	ACM0002 (version 6) Consolidated baseline methodology for grid-connected electricity generation from renewable sources
2	Standard for applying materiality in verifications (version 01)
3	IPCC Guidelines for National Greenhouse gas inventories 2006
4	Order A-102 dated 05/03/2010 of the Chair of State Agency for Metrology and Technical Supervision regarding periods of testing of measurement devices
5	Decision C-010 dated 30/03/2011 of the State Commission for Electricity and Water Regulation

## 7.2 Appendix B: Certificate of Appointment

### Verification of "Kaliakra Wind Power Project"

We hereby certify that the following personnel have engaged in the verification process that has fully satisfied the competence requirements of the verification of the JI project activity.

#### **Name of Person**

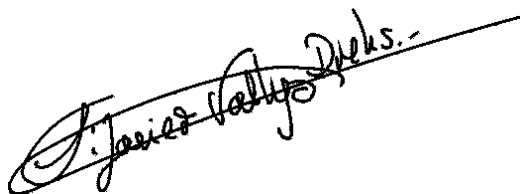
Lyubka Marinova  
Javier Vallejo Drehs

#### **Assigned Roles**

Team Leader, Sector Expert  
Technical Reviewer,  
Decision Maker

Signed by

#### **Decision Maker**



10/12/2012

Javier Vallejo Drehs  
CDM/JI Quality Manager

## 7.3 Appendix C: Checklist for Verification

This document has been produced by the LRQA Verification Team after the completion of the desk review and the site visit. It outlines the verified situation in relation to a number of criteria, including those defined in the Determination and Verification Manual (DVM) produced by the JI Supervisory Committee.

If LRQA has identified issues requiring corrective action or clarification, a reference is made in the 'Action requested' column, and details are stated in the column marked 'Conclusion'.

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
Project approvals by Parties involved					
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in line with paragraph 38 of the JI guidelines, at the latest?	Letters of approval both from Bulgarian Ministry for Environment and Water (dated 26-00-2924 dated15/01/2010) and the Japanese Minister for Economy, Trade and Industry (dated 29/01/ 2010) were presented. Letters presented in Appendix 1 to Monitoring report.			OK
91	Are all the written project approvals by Parties involved unconditional?	Letters of approval are unconditional.			OK
Project implementation					
92	Has the project been implemented in line with the PDD on which the determination has been deemed final and is so listed on the UNFCCC JI website?	35 wind turbines (1 MW each) have been installed within an area as indicated in the PDD version 1.2 (rev. 1.0) dated 03/12/2009. The installed equipment has not changed since previous verification and corresponds to the description in PDD version 1.2 (rev. 1.0) dated 03/12/2009 as determined with Final Determination report for Kaliakra Wind Power Project Revision No 03-14/05/2010 issued by JACO CDM Ltd. The turbines have 3-blade rotors and are of MWT-1000A type, 69 m height. Induction generator of 690 volts at 1500 rpm is installed in each turbine. All 35 turbines are connected to local power sub-station which is connected to the National Power Grid. Electricity generated is sold to National Electricity Company. Control centre was constructed and was found to be operational during site visit. License for electricity production dated 13/07/2006 granted to Kaliakra Wind Power by the State Commission for Energy and Water Regulation has no fixed validity period.			OK



DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
93	What is the status of operation of the project during the monitoring period?	<p>All equipment and facilities were found operational during the site visit. All equipment has been operational in 2012 apart from stops for annual maintenance and occasional failures of equipment as presented in detail in Semi-annual operations report No 2012-H1 covering first half of 2012. The semi-annual report for the second half of 2012 will be finalised early 2013. Internal maintenance records were reviewed for conducted activities in the period 01/07/2012 till 30/11/2012.</p> <p>Due to limitations in local electricity circuit capacity as a result of connecting of new power producer in the region, in Aug 2012 the body Electroenergien Systemen Operator has imposed restrictions on the output capacity of KWP up to 33 MW. The restriction acted as a factor for the lower electricity production in the period Jan 2012 – Nov 2012, compared to estimated figures in PDD.</p> <p>Difference in O&amp;M costs as presented in PDD ver 1.2(rev 1.) dated 03/12/2009 (1300000 Euro per year) and the presented figures in semi-annual O&amp;M reports were established.</p> <p>In accordance with Bulgarian applicable legislation the electricity tariff has been updated as of 01/04/2011 with a Decision C-010 dated 30/03/2011 of the State Commission for Energy and Water Regulation and has been 188.29 lv/MWh (approx 9.62 eurocent/kWh). In Bulgarian the exchange rate lv/Euro is fixed to 1.95583.</p> <p>The operational and maintenance activities and associated costs for first half of 2012 were presented with Semi-annual operations reports No 2012-H1 and for up-dated figures were also presented for the period 01/07/2012-30/10/2012. For IRR up-date, for Nov and Dec budget figures are applied.</p> <p>Up-dated IRR figures are presented in the monitoring report and these show that the benchmark defined in the PDD is not exceeded.</p>			OK
Procedures regarding changes during project implementation. (if applicable)					
6	Has the PP prepared a detailed description of all changes that have occurred since the determination was deemed final and provided justification for these changes?	As Described in section above.			NA
7	The physical location of the project can not change	The project location was proved to be corresponding to the description provided in PDD ver 1.2 (rev 1.0) dated 03/12/2009 and it was confirmed that it has not changed in 2012. Project location is Kaliakra Cape, near Bulgarevo village, Kavarna municipality, Bulgaria.			OK
7	If the emission sources have changed, has the PP updated the monitoring plan in this respect?	Emission sources have not changed as described in PDD ver 1.2 (rev 1.0) dated 03/12/2009.			OK
7	The baseline scenario shall not change.	The baseline scenario has not changed.			OK
7	Are the changes consistent with the JI specific approach or the clean development mechanism (CDM) methodology on which the determination was prepared for the Project?				NA
Compliance with monitoring plan					

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
94	Did the monitoring occur in line with the monitoring plan included in the PDD on which the determination has been deemed final and is so listed on the UNFCCC JI website?	<p>Monitoring plan includes two parameters as per PDD ver. 1.2 (rev.1.0) dated 03/12/2009 – section D – (1) Electricity generated and supplied to the grid and (2) CO2 emission factor of the national grid. According to monitoring plan the first parameter Electricity generated and supplied to the grid shall be measured continuously in MWh and data should be archived electronically. Measured data are compared with invoiced data</p> <p>Energy supplied to the grid for the period 01/01/2012 – 30/11/2012 was measured continuously by energy meter (ID number 07120767) owned by NEC (purchaser of the electricity) and data are transmitted electronically to NEC.</p> <p>Based on measured data NEC issued monthly protocols. Daily readings of the same meter are recorded manually by shift operator at midnight. Three tariffs are recorded: daily, night and peak. The same meter measures the electricity purchased by KWP from the grid to cover own needs when necessary. The data about purchased electricity are recorded and transmitted in the same way as described for the generated and supplied to the grid electricity. Manual readings taken by the shift operator are organised for this purpose in a specific log-sheet and afterwards transferred to the excel file. Records for the monitoring period 01/01/2012 – 30/11/2012 were presented and compared with the data in the excel file. No errors were detected.</p> <p>In parallel to the power meter owned by NEC, KWP have installed a control meter (ID 07120766). This meter is of the same type as the NEC power meter. Data from this meter are manually recorded at midnight everyday by the KWP shift operator.</p> <p>Data from the two meters are compared. Results are presented in Monitoring report and respective attachments.</p> <p>Additionally, generated electricity is measured at different locations within plant by SCADA system. These readings are transmitted to control room electronically and are used for comparison purposes as presented in the monitoring report.</p> <p>Deviations between the three measurement sources are presented and explained in the monitoring report.</p> <p>The second parameter involved in the emission reduction calculation, the grid emission factor is calculated ex-ante based on ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version. 6) and based on Baseline Study of Joint Implementation projects in the Bulgarian Energy Sector: Carbon emission factor, MOEW 2006 (as presented in Appendix 2 to PDD ver 1.2 (rev. 1.0) dated 03/12/2009. The carbon emission factor is fixed for the whole crediting period (2008-2012) as stated in the PDD.</p>			OK

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, for example, those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	<p>Baseline Study of Joint Implementation projects in the Bulgarian Energy Sector: Carbon emission factor, MOEW 2006 ordered by the Bulgarian Government has been used for determining the applicable grid emission factor in accordance with Appendix 2 to PDD ver 1.2 (rev. 1.0) dated 03/12/2009.</p> <p>KWP uses emergency diesel generator to cover emergency own needs (lights, computers) when the wind farm is not producing electricity and the substation is under annual revision. Records are maintained for the actual operation of the emergency diesel generator (including monthly tests) as well as records are maintained for the purchased diesel quantities. Log sheets were reviewed and it was confirmed that 200 l of diesel has been used in the period 01/01/2012 – 30/11/2012 by the diesel generator.</p> <p>Using density factor of 0.85 kg/m<sup>3</sup> to convert diesel litres to kg (this density factor corresponds to the specification of the fuel delivered by fuel supplier OMV) and applying reference values for NCV and emission factor for combustion of diesel fuel in stationary sources from the IPCC 2006 Guidelines, Volume 2 (max values 43.3 TJ/Gg and 74.8 tCO<sub>2</sub>/TJ) it was estimated that the CO<sub>2</sub> emissions from the diesel generator for the period 01/01/2012-30/11/2012 were 0.55 t CO<sub>2</sub>, which is below 0.001% of the total reported CO<sub>2</sub> emissions for the current monitoring period.</p> <p>Based on the provisions of the standard for applying materiality in verifications the estimated CO<sub>2</sub> emissions amount from the use of diesel fuel at KWP are far beyond 5% threshold and therefore are considered not relevant for the reported emission reductions. The total amount of ERUs is considered free of material error or omissions, being the verification opinion based on a reasonable level of assurance.</p>			OK
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	Data sources are clearly described in the monitoring report as presented above.			OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	Monitoring report clearly makes reference to Baseline Study of Joint Implementation projects in the Bulgarian Energy Sector: Carbon emission factor, MOEW 2006 which is the source applied for determination of the grid emission factor used for monitoring period 01/01/2012 – 30/11/2012 emission reductions calculation.			OK

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
95 (d)	Is the calculation of emission reductions or enhancements of net removals calculated based on conservative assumptions and the most plausible scenarios in a transparent manner?	<p>Calculation of emission reductions is done using the monthly data from the NEC protocols. The total generated electricity for the monitoring period 01/01/2012 – 30/11/2012 based on these documents was confirmed to be 61,571.946 MWh. The electricity purchased from the grid is calculated in the same way based on the monthly NEC protocols – 563.509 MWh. Thus net generated electricity was confirmed to amount to 61,008.437 MWh.</p> <p>Calculation of emission reductions is done applying the following formula:</p> $ER(t) = GEN(t) * CEF$ <p>where</p> <p>ER(t)                      Emission reductions in a year t (tCO<sub>2</sub>)</p> <p>GEN(t)                  Electricity, generated and supplied to the grid in a year t (MWh)</p> <p>CEF                        Baseline CO<sub>2</sub> emission factor (tCO<sub>2</sub>/MWh)</p> <p>According to PDD ver 1.0 (rev 1.2) emission factor to be applied is calculated ex-ante and is fixed for the monitoring period. The value applied is 1.026 tCO<sub>2</sub>/MWh.</p> <p>Therefore:</p> $ER = 61,008.437 * 1.026 = 62,595 \text{ tCO}_2$ <p>During the verification process it was confirmed that the emission reductions calculated in the monitoring report are correct and correspond to the provisions in PDD version 1.0 (rev. 1.2).</p>			OK
<b>Applicable to JI SSC projects only</b>					
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	NA			NA
<b>Applicable to bundled JI SSC projects only</b>					
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	NA			NA
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	NA			NA

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	NA			NA
<b>Revision of monitoring plan</b>					
<b>Applicable only if monitoring plan is revised by project participants</b>					
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	NA			NA
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	NA			NA
<b>Data management</b>					
101 (a)	Is the implementation of data collection procedures in line with the monitoring plan, including the quality control and quality assurance procedures?	Data collection, quality control and quality assurance procedures were found in line with monitoring plan. The responsibilities for monitoring and reporting are in line with determined monitoring plan. Readings of own and control power meters are recorded daily by shift operator. The data are compared with data from SCADA system. Any deviation in readings is calculated in % in order to detect need for earlier calibration of the power meters. Internal audit system, corrective and preventive actions procedures are in place and were found operational. Details for the reviewed evidence are provided in sections below.			OK

DVM para	Check item	Initial finding	Action requested to project participants (incl. CAR, CL or FAR)	Review of project participants' action	Conclusion
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	<p>According to monitoring plan the readings of power meter owned by NEC are used for estimation of net produced electricity and for calculation of emission reductions.</p> <p>According to local legislation and as described in KWP Management procedure MP EN_05 Rev.02 power meters and currency and voltage transformers have to be calibrated every two years. Both, power meter owned by NEC and the control meter owned by KWP, have undergone calibration in May 2011. The calibration of both commercial power meter owned by NEC and the KWP control power meter did not show deviation in their characteristics.</p> <p>Currency and voltage transformers were checked also in 2011. Both checks did not reveal deviation in transformer characteristics.</p> <p>According to local legislation power meter testing is due every 2 years.</p> <p>Difference in readings of both commercial and control meters and the data generated by SCADA system are monitored on daily basis and the differences do not require initiation of additional calibration of the commercial power meter. Power Purchase Agreement states that additional calibration can be initiated if differences between commercial and control meter reach 1.5%.</p> <p>Based on this it is considered that the data for the monitoring period 01/01/2012-30/11/2012 are reliable and free from material errors.</p>			OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	<p>Monitoring records at KWP are maintained in traceable manner. Data about generated and purchased electricity are kept both on paper and electronic format. Reliable system for data collection is maintained for diesel delivery on-site and consumption as well as for the operation of all facilities (including maintenance).</p>			OK
101 (d)	Is the data collection and management system for the project in line with the monitoring plan?	<p>Internal management procedure MP EN_05 Management procedure rev. 02 specifies activities and responsibilities about data collection and calculation of emissions. Order described in the procedure was found in line with monitoring practices at the wind power plant in terms of responsibilities, records, frequency of readings, internal audits. One internal audit covering the whole reporting period (Jan-Nov 2012) took place on 26/11/2012 and associated plan and report were presented.</p> <p>Based on the own monitoring plan of Kaliakra Wind Power covering environmental issues, in June 2012 noise measurements were carried out in the Wind park area and at Bulgarevo village. Results (Report 1233 dated 21/06/2012) show that noise levels are in line with local legislation. Same are the results from the measurements carried out for electromagnetic field (Report FF-72 dated 11/06/2012).</p> <p>Radar system for continuous monitoring of bird migration was operational during the site visit.</p> <p>Based on verbal information provided by Chief Operations officer no claims or complains were received in the period 01/01/2012-30/11/2012 regarding the operation of the wind farm.</p> <p>Records in the Journal for inspection of the territory of the power plant done by operators were reviewed and no issues requiring actions were found.</p> <p>Training of personnel is maintained in compliance with developed training program, mainly focused on maintaining qualification for work with electrical equipment as required by local regulations and ensuring emergency preparedness and response (fire fighting, first medical aid, etc.).</p>			OK

### Monitoring Parameters and Calibration Table:

Data / Parameter (as in the MP)		Electricity generated and supplied to the national grid MWh	CEF tCO <sub>2</sub> /MWh
Value	Ex-ante	61,008.437	1.026
	Ex-post		
Measuring frequency		Continuous	Calculated at the time of preparation of PDD
Reporting frequency		Monthly	Fixed for the crediting period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Measurement frequency found in accordance with PDD. Reporting frequency is not specified in the monitoring plan. Reporting frequency found in line with Management procedure MP EN_05 Management procedure rev. 02.	Yes
Recording (Manually / electronically/...)		Data from commercial meter are electronically transmitted to NEC. Shift operator manually records data at midnight every day in specific form and then data are transferred in Excel sheet.	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		Daily data manually recorded from the commercial meter are cross-checked with manually recorded daily data from control meter and electronically transmitted data from SCADA system. Monthly aggregated data from these three sources are cross-checked with data from monthly protocols delivered by NEC.	NA
Type of Monitoring Equipment and Identification number or Reference in the PDD		No specific reference in the PDD	NA
Is accuracy of the monitoring equipment as stated in the PDD? If not stated in the PDD, does it represent good monitoring practices?		Accuracy is not stated in the PDD. The accuracy class of 0.2S corresponds to power meters with high accuracy and represents implementation of good practices for electricity measurement.	NA
Period of operating time		Put into operation in March 2008 when the power plant was commissioned.	NA
Instrument type		AINRTAL-X	NA
Manufacturer, model and serial number		ID number 071206767 type AINRTAL-X, accuracy class 0.2S manufacturer ABB	NA
Specific location		Control distribution unit at Kaliakra Wind Farm. Power meter is owned by National Electricity Company (NEC)	NA
Calibration dates		03/05/2011 latest testing. Next calibration due in May 2013 in accordance with local legislation.	NA
Company performing the calibration		EMSyst EOOD performed testing. Reports stamped and signed by representative of Bulgarian metrology Institute – Regional division Varna (National body for testing of measuring devices in accordance with Bulgarian Measurement Act).	NA

Data / Parameter (as in the MP)	Electricity generated and supplied to the national grid MWh	CEF tCO <sub>2</sub> /MWh
Required calibration frequency: Is it in line with the MP? Or does it represent good monitoring practices?	<p>The calibration frequency is not specified in the MP.</p> <p>In accordance with the order A-102/05.03.2010 of the Chair of State Agency for Metrology and Technical Supervision based on the requirements of art 43 of the Measurement Act the period for testing of power meters for power between 10 MVA and 60 MVA is fixed to two years. Measurement transformers (current and voltage) are not subject to periodic testing anymore.</p> <p>All available testing documents were reviewed.</p> <p>The electricity meter is of high accuracy class 0.2S.</p> <p>In parallel to the commercial meter another meter of the same type, manufacturer and accuracy class owned by KWP has been installed before operation of the power plant started and the readings of these two meters are compared on daily, monthly and on annual basis. Deviations on monthly basis are compared with the requirements fixed in Art 37 of Power Purchase agreement.</p>	NA
Is calibration valid for the whole reporting period?	<p>Latest calibration document for the commercial meter owned by National Electricity Company in accordance with local regulations is dated 03/05/2011. Current and voltage measurement transformers delivering signals to the power meter were tested also in May 2011.</p> <p>In addition on 3/05/2011 KWP have calibrated the control meter ID number 07120766 same type, manufacturer and accuracy class in order to increase reliability of data used for cross-checking of commercial power meter readings.</p> <p>Test certificate was presented.</p>	NA
Maintenance	No evidence for failure and maintenance activities was detected or presented.	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	<p>Procedure is established that regulates the monitoring and reporting process.</p> <p>Transfer of data and reporting is in line with the procedure. Several cross-checks of monitored data are implemented on daily, monthly and annual basis that allow correct data transfer and reporting.</p>	NA
Key reporting risks	Reporting risks are estimated to be low as several data cross-checks are implemented.	NA