



GOLD STANDARD VERIFICATION REPORT

01/10/2013 - 31/03/2015
for the GS-VER Project Activity

ÇANAKKALE WPP (TURKEY)

(GS-No. 906)

Report No. 2122 8472 A
Version No. 1.0

I. Project data:

Project title:	ÇANAKKALE WPP	
Registration No. / Date:	GS No. 906 / 03-08-2012	
Monitoring period:	01/10/2013 — 31/03/2015	
Methodology:	ACM0002, version 12.1	
Emission reductions:	Computed: 69,172 tCO ₂ e	Verified: 69,172 tCO ₂ e
GHG reducing measure/technology:		

Party	Project participants	Party considered a project participant
Republic of Turkey	Enerjisa Enerji Üretim A.Ş.	No
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II. Verification data:

Contract party:	Contracting Client Organization
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Verification team

Role	Full name	Appointed for Sectoral Scopes / GS-DOE Webinars Participation	Affiliation
Team Leader	Norbert Heidelmann	1.2, 13.1, 13.2, 15.2.	TÜV Rheinland Energie und Umwelt GmbH
Team Member	Kurt Seidel	1.1,1.2,2.1,2.2,3.1,4.5,13.1/ 18/03/2014; 18/06/2014; 26/03/2015	TÜV Rheinland Energie und Umwelt GmbH
Technical Reviewer	Prof. Dr. Günter Schock	1.1, 1.2, 3.1, 4.5, 5.1, 11.1, 12.1, 13.1	TÜV Rheinland Energie und Umwelt GmbH

III. Verification report data:

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Final approval: ☒	Released on: 12/05/2015	Designated Operational Entity (DOE): TÜV Rheinland (China) Ltd. (E-0013)
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Verification opinion — summary

The verification team assigned by the DOE (E-0013: TÜV Rheinland) concludes that the GS-VER Project Activity “ÇANAKKALE WPP” (GS-NO. 906), as described in the PDD (Version: 09, Date: 04/09/2012) and monitoring report (Version 04.0, Date: 04/05/2015), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board as well as Gold Standard requirements for GS-VER projects.

The project activity was correctly implemented according to selected monitoring methodology(ies) and monitoring plan. The monitoring equipment was installed, calibrated and maintained in a proper manner, while collected monitoring data allowed to verify the amount of achieved GHG emission reductions. TÜV Rheinland therefore is pleased to issue a positive verification opinion expressed in the attached Certification statement.

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1. Introduction

Enerjisa Enerji Üretim A.Ş. has commissioned TÜV Rheinland to perform a verification of the of the Gold Standard VER Project Activity “ÇANAKKALE WPP” (GS-NO. 906) in the host country Turkey (hereafter “project activity”). This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM modalities and procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board and the requirements of Gold Standard Foundation for GS-VER. The GS criteria refer to GS requirements version 2.1, GS Toolkit, supporting annexes and subsequent clarifications from Gold Standard Foundation.

1.1 Objective

The purpose of verification is to review the monitoring results and verify that monitoring methodology was implemented according to monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner. The objective of this verification/certification was to verify and certify emission reductions and effectively implementation of the monitoring of sustainable development indicators and mitigation measures, reported for the “ÇANAKKALE WPP” for the period 01/10/2012 to 31/03/2015 (both days included). In particular, monitoring plan, monitoring report and the project’s compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the project has been implemented in accordance with previously registered design and conservative assumptions, as documented.

1.2 Scope

The verification comprises a review of the monitoring report over the monitoring period from 01/10/2012 to 31/03/2015, based on the PDD, submitted for registration with regard to the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, sustainable development indicator screening, monitoring methodology, monitoring tool and all related evidences provided by project participants. These documents have been reviewed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and rules and guidance of Gold Standard.

On-site visit, stakeholders interviews and follow-up interviews were also performed on 20/04/2015, 21/04/2015, 30/04/2015 and 04/05/2015 as part of the verification process.

The verification considers both quantitative and qualitative information on emission reductions and sustainable development indicators. The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the monitoring activities.

2. Methodology

The verification consists of the following three phases:

1. Desk review of the monitoring plan, monitoring report, project design document and other relevant documents;
2. On-site visit (including follow-up interviews with project stakeholders, when deemed necessary);
3. Resolution of outstanding issues and the issuance of the final Verification report and Certification statement.

The following sections outline each step in more detail.

2.1 Desk review

The following table outlines the documentation reviewed during the verification:

No. Project Design Documents

- /1/ GS-VER PDD “Çanakkale WPP”, version 9, dated 04/09/2012
- /2/ GS-VER Passport “Çanakkale WPP”, version 9, dated 03/10/2012

Stakeholder Consultation Documents

- /3/ Gold Standard Local Stakeholder Consultation Report “Çanakkale WPP”, dated 03.11.2011

Monitoring / Verification Documents

- /4/ Monitoring Report of Çanakkale WPP, version 2 of 25/12/2013
- /5/ Gold Standard Verification/Certification Report “Çanakkale WPP” of RINA Services S.p.A., Report No. 2013-TQ-63-MD, Revision No. 1.2, dated 08/01/2014
- /6/ Third Monitoring Report of “Çanakkale WPP”, version 0 of 13/03/2015
- /7/ Revised Third Monitoring Report of “Çanakkale WPP”, version 1 of 27/04/2015
- /8/ ER-Calculation Excel Sheet “Generated and Consumption Electricity for DGP Çanakkale of 27/04/2015
- /9/ Final Revised Monitoring Report of Çanakkale WPP, version 04.0 of 04/05/2015
- /10/ Revised ER-Calculation Excel Sheet “Generated and Consumption Electricity for DGP Çanakkale of 04/05/2015

Employment Documents

- /11/ Çanakkale personnel social security records
- /12/ Çanakkale personnel residence records

Training Documents

- /13/ Çanakkale personnel HV-Licenses
- /14/ Çanakkale training participation records from 2014

Documents SD Indicators

- /15/ AECOM Turkey: Report No. TR –R-363-01-01, dated October 2010 “Auditing Environmental and Social Commitments of Çanakkale Wind Farm Project – October 2010”
- /16/ ISO 14001:2004 Certificate No. TR32199 of Bureau Veritas Certification, dated 29

March 2012 for Enerjisa Enerji Üretim A.Ş. including Çanakkale WPP

/17/ Evidences and photos for donations of Enerjisa Enerji Üretim A.Ş. to the Primary Schools of Mahmudiye and Uvecik in 2013 and 2014

/19/ Hazardous Waste Forms of 2013 and 2014

/21/ Enerjisa Enerji Üretim A.Ş.: Project Description of "Çanakkale WPP" in Turkish language

Power Generation Documents

/23/ Monthly Meter Reading Protocols for 2013, 2014 and 2015

/24/ Çanakkale WPP monthly PMUM screenshots for 2013, 2014 and 2015

Calibration Documents

/25/ TEİAŞ: Çanakkale WPP Periodic Metering Test Protocol according to IEC 62053-22

/26/ EMH Calibration Certificate for Power Meters of Çanakkale WPP, dated 21/01/2014

Technical Documents

/26/ Siemens Wind Power A/S: Product data sheet of Siemens Wind Turbine SWT-2.3-101

/27/ Çanakkale WPP Single Line Diagram

/28/ Çanakkale WPP Turbine Coordinates Approval

/29/ Siemens Wind Power A/S: Product information on sound levels according to IEC 61400 of Siemens Wind Turbine SWT-2.3-101

Permits, Licenses

/30/ Temporary acceptance protocols, dated 11/02/2011 and 06/05/2011

/31/ Generation license No. EÜ/1501-2/1088 of 21/02/2008

Organizational Documents

/32/ Çanakkale WPP Organigram

Other Documents

/33/ Approved consolidated baseline and monitoring methodology ACM0002

"Consolidated baseline methodology for grid connected electricity generation from renewable sources", Version 13.0.0 of 11/05/2012

/34/ Methodological Tool "Tool to calculate the emission factor for an electricity system", Version 02.2.1 of 29/09/2011

/35/ Monitoring Report Form CDM-MR-Form, Version 04.0

/36/ CDM Validation and Verification Standard, Version 07.0

/37/ Glossary CDM Terms, Version 07.0

/38/ Gold Standard Version 2.1 Requirements

/39/ Gold Standard Version 2.1 Toolkit

/40/ The Gold Standard Continuous Input & Grievance Mechanism

/41/ Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy "Law No. 5346", Amended by Laws: 5627, 5784, 6094 and 6011

/42/ Regulation for High Voltage Facilities in Turkey

/43/ Communiqué regarding the Meters to be used in the Electricity Market (TEİAŞ)

/44/ Electricity Market Balancing and Settlement Regulation (TEİAŞ)

/45/ Measurement and Measuring Tools Inspection Regulation

- /46/ Regulation on Assessment and Management of Environmental Noise (Official Gazette Date: 07.03.2008, 2002/49/EC), Annex VIII, Table 4
- /47/ GS VER Verification Work Plan “Çanakkale WPP” of 18/04/2015
- /48/ “Capacity factor of wind power realized values vs. estimates” Nicolas Boccard, Departament d’Economia, Universitat de Girona, Spain (Energy Policy 37,2009)
- /49/ “Mean Time Between Faults, The Hidden Factor in Turbine Unavailability”, by Craig Christenson, Vice President of Engineering, Clipper Windpower, USA (Windtech International July/August 2010)
- /50/ Willem Post “Energy From Wind Turbines Actually Less Than Estimated?”, dated 10/01/2013
- /51/ Gold Standard Validation Report “Çanakkale WPP” of Germanischer Lloyd Certification GmbH, GLC Report No. GS008, rev. 10, dated 07.02.2012

Additional Documents

- /52/ Enerjisa Enerji Üretim A.Ş.: Çanakkale Wind Power Plant Project Introduction Brochure

2.2 On-site visit and follow-up interviews with project stakeholders

Date	Name	No.	Organization/ Function	Topic
20/04/2015; 21/04/2015	Mrs. Sıla Kılıç	/A/	Enerjisa Enerji Üretim A.Ş. / Carbon Developer	Project implementation and permits; Monitoring report and raw data and supporting documents for emission reductions and SD parameters;
21/04/2015	Ms. Gizal Ulman	/B/	Enerjisa Enerji Üretim A.Ş. / Carbon Developer Assistant	Environmental and social impacts; Community benefits;
20/04/2015	Mr. Halil Gencel	/C/	Çanakkale WPP / Shift Leader	Training for operation, health and safety;
20/04/2015	Mr. Ersin Kaymak	/D/	Çanakkale WPP / Operation Support Technician	Social security and residential records of employees; Monitoring equipments and calibration status;
20/04/2015	Mr. Kadir Durmaz	/E/	Çanakkale WPP / Operation Technician	Follow up on FARs of previous verification, input from residents and neighbors
20/04/2015	Mr. Enver Demiral	/F/	Çanakkale WPP / Security Guard	
20/04/2015	Mr. Ahmet Deniz	/G/	Çanakkale WPP / Security Guard	
20/04/2015	Mr. Ömur Girün	/H/	Çanakkale WPP / Security Guard	
20/04/2015	Mr. Recep Eken	/I/	Mahmudiye Village / Muhtari (Village Head)	Community benefits; Follow up on local stakeholder consultation , Input from residents and

				neighbors, especially noise impact
20/04/2015	Mr. Ahmet Kocpmis	/J/	Siemens WP PS	Visit of Wind turbine T 13 with regard to noise impact to nearby residents of Mahmudiye Village

In case it was decided that on-site assessment will not be performed, DOE shall provide a clear rational behind the decision.

2.3 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues which have to be clarified prior to final conclusions of the verifier on the project implementation, monitoring practices and achieved emission reductions. In order to ensure transparency a verification protocol is completed for the project activity. The protocol shows in transparent manner criteria (requirements), means of verification and resulting statements on verification actual project activity against identified criteria.

The verification protocol serves the following purposes:

- It organises in a table form, details and clarifies the requirements, which the GS-VER project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The verification protocol consists of two tables. Table 1 reflects the verification requirements and reference to the materials used to verify the project activity against those requirements, as well as means of verification, reference to Table 2 and preliminary and final opinion of the verifier on every particular requirement. The completed verification protocol for this project is enclosed in Appendix A to this report.

Findings during the verification can be interpreted as a non-compliance with CDM criteria or a risk to the compliance. Corrective action requests (CARs) are raised, in case:

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

Requests for clarification (CLs) are raised, if information is insufficient or not clear enough to determine whether the applicable CDM- and GS-requirements have been met.

2.4 Internal quality control

The final verification report has passed a technical review before being submitted to the project participants. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

Role	Full Name	Appointed for Sectoral Scopes <i>GS-DOE Webinars Participation</i>	Affiliation
Team Leader	Norbert Heidelmann	1.2, 13.1, 13.2, 15.2.	TÜV Rheinland Energie und Umwelt GmbH
Team Member	Kurt Seidel	1.1,1.2,2.1,2.2,3.1,4.5,13.1/ 18/03/2014; 18/06/2014; 26/03/2015	TÜV Rheinland Energie und Umwelt GmbH
Technical Reviewer	Prof. Dr. Günter Schock	1.1, 1.2, 3.1, 4.5, 5.1, 11.1, 12.1, 13.1	TÜV Rheinland Energie und Umwelt GmbH

See Appendix C: Certificates of Competence (Upon Request)

3. Verification findings

The findings of the verification are described in the following sections. The verification criteria (requirements), the means of verification and the results of validation are documented in detail in the verification protocol in Appendix A.

3.1 Project implementation

3.1.1 The implementation of the project activity

Based on the review of the relevant documents no remaining issues were identified.

The project is fully implemented according to the description presented in the GS VER PDD. The verifier confirms, through the visual inspection that all physical features of the proposed GS VER project activity including data collecting systems and storage have been implemented in accordance with the GS-VER PDD. The project activity is completely operational and the same has been confirmed on-site during on-site visit on 9th of December 2010.

The project activity consists in the installation and operation of 13 wind turbines Siemens SWT-2.3-101 having 2.3 MW capacity each; resulting in an overall capacity of 29.9 MW, which is in compliance with the installed capacity of the generation license /31/ and the description in the PDD (/1/) and monitoring report (/6/,/7/,/9/).

The geographic coordinates for each turbine is confirmed by the Generation License issued by the regulatory market authority EPDK, which could be confirmed in spot checks with a portable navigation system during on-site visit. Moreover the project boundary in the PDD is in line with the actual project boundary. Hence, TÜV Rheinland's verification team confirms that the project activity has been implemented and it is in operation as described above in accordance with the project activity in the PDD.

3.1.2 The actual operation of the CDM project activity

The verified net electricity generation of 113,398,980 kWh for the whole monitoring period of one and a half year with an average capacity factor of 28.9 %, equivalent to emissions reductions of 69,172 t CO₂,eq in this monitoring period were only slightly higher than the estimates for a whole calendar year (91,570,000 kWh with an average capacity factor of 35 %, equivalent to 55,878 t CO₂,eq) in the GS-VER PDD, which is based on the amount of net electricity generation, which is stated in the generation license /31/.

From other investigations in Turkey is known that already operating wind farms in Turkey had a load factor or capacity factor which was in average around 32 % after first periodic verification, which is however nearly 20 % below the expected wind energy yield, but still higher than the average capacity factor today of 25%, typical capacity factors are 20–40%, with values at the upper end of the range in particularly favourable sites and variation within the seasons of the year with highest capacity factors in the winter months (see: <http://www.wind-energy-the-facts.org/de>).

According to independent studies, where the real capacity factors are recorded annually and other background research of different sources, e.g. /48/, /49/, /50/, it can be concluded that the average actual production figures are in a lot of cases more than 10 % below the predicted pre-construction projections, caused by an overestimation of the capacity factor and the availability of the wind farms. These deviations are higher in countries with a few wind farms and less experiences in the field of operation and maintenance of wind farms, which results often in lower availabilities of the wind farms.

Only one interruption of operation due to technical failure has been reported for the Çanakkale WPP within the monitoring period:

WTG 03: 9 days due to replacement of the main bearing.

Therefore the validation team came to the conclusion that the resulted lower technical availability of wind turbine WTG 03 was only one reason for the underperformance of the wind farm.

Under consideration of a normal operation without technical problems in the coming years a capacity factor of at least 32 % should be achievable, which would be similar to other wind farms operated in Turkey, which have achieved capacity factors of more than 33 %.

FAR 1: Prior to the next periodic verification it should be further elaborated in more detail, what have been the reasons for the underperformance in comparison to the wind energy yield predictions, as besides of the above mentioned technical failure no other malfunction,

resettlement, repair service or any other relevant event with effects on the availability of the wind farm has occurred within this monitoring period.

3.2 Compliance of the monitoring plan with the monitoring methodology

The registered project activity applies the approved baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources", Version 13.0.0 of 11/05/2012 /33/ and in addition the methodological tool "Tool to calculate the emission factor for an electricity system", Version 02.2.1 of 29/09/2011 /34/.

TÜV Rheinland's verification team confirms that the monitoring plan in the PDD (/1/) complies with the applied CDM methodology and with the sustainability indicators established by the Gold Standard requirements (/38/,/39/).

3.3 Compliance of the monitoring with PDD and monitoring plan

Monitoring of reductions in GHG emissions to result from the proposed GS-VER project activity has been implemented in accordance with the monitoring plan contained in the PDD and the relevant monitoring plan.

3.3.1 Monitored parameters

The emission reductions have been calculated based on the formula:

$$ER_y = BE_y - PE_y - LE_y$$

BE_y baseline emissions in year y (tCO₂e/yr)

PE_y project emissions in year y (tCO₂e/yr)

LE_y leakage emissions in year y (tCO₂e/yr)

The baseline emissions include the CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity

The net electricity supplied to the grid in kWh is multiplied with the calculated combined margin CO₂ emission factor for grid connected power generation. Since the project activity involves the generation of electricity by a wind farm and does not result in greenhouse gas emissions, the project emissions are zero. The leakage emissions account to zero too as the energy generating equipments is not transferred from or to another activity.

The monitoring has been carried out in accordance with the monitoring plan contained in the registered GS-VER PDD and in the Monitoring Report. All parameters were monitored and determined as per the Monitoring Plan.

The verification of the parameters required by the monitoring plan is provided as follows:

Data / Parameter:	EG _v : Net electricity generation
Data unit:	MWh
Description:	The net electricity generated by the Project during the monitoring period
Source of data used:	Raw data recorded by bi-directional meters (1 main meter, 1 back-up meter) Daily records in logbook Monthly meter reading protocols signed by Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP and TEİAŞ Monthly PMUM reports Monthly invoices Scada data only for internal cross-checking
Means of verification, Comments:	The verification team has verified through desk review and on-site spot check that the net amount of power supplied to the grid by the project used in the calculation sheet (excel sheet) and reported in the MR are correct and traceable to the raw data.
Cross-check:	The net electricity generation at the power plant was cross-checked against the daily recorded log book during on-site visit. The data recorded by the metering instruments is cross-checked against the data indicated in the monthly meter reading protocols signed by Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP and TEİAŞ, the monthly PMUM reports and the monthly invoices. No deviations could be identified.

With respect to GS requirements, the project has to comply with the parameters in Sustainable Development Indicators Matrix according to Gold Standard Version 2.1 Requirements /38/ and Gold Standard Version 2.1 Toolkit /39/. The project proponents have defined 5 indicators out of this Matrix to be audited regularly, as to identify any short term fluctuations:

SD-ID.1: Soil Condition

The relevant storage facilities for hazardous waste (waste oil and fuel) and for waste batteries. used fluorescent lamps and discarded electronic equipments has been visited. It has been confirmed, that after a legally permitted temporary storage in the Waste Accumulation Area the hazardous waste will be transferred via a licensed service provider. Relevant evidences /19/ have been made available to the verifier.

SD-ID.2: Human and institutional capacity

It has been confirmed that local education is supported by Enerjisa Enerji Üretim A.Ş. Relevant evidences and photos /17/ have been made available to the verifier.

Data / Parameter:	SD-ID.3: Other pollutants (Noise emissions)
Data unit:	dB(A) at nearby residential areas
Description:	Noise emission of wind turbines at nearby residential areas:
Source of data used:	Report No. TR –R-363-01-01, dated October 2010 “Auditing Environmental and Social Commitments of Çanakkale Wind Farm Project – October 2010” of AECOM Turkey /15/ and Manufacturer information on the Sound Power Level for Siemens Wind Turbine SWT-2.3-101 (/26/,/29/); Regulation on Assessment and Management of Environmental Noise (Official Gazette Date: 07.03.2008, 2002/49/EC), Annex VIII, Table 4 /46/
Means of verification, Comments:	Desk review of Noise Measurement Report No. 12-LG-071 of Selin Lab, dated 19/05/2012 /18 / and Manufacturer information on the Sound Power Level for Siemens Wind Turbine SWT-2.3-101(/26//29/); Stakeholder Interviews, On-Site Visit, Follow up visit of wind turbine T 13 together with Mr. Halil Gencil /C/ and Mr. Ahmet Kocpmis /J/. A very low noise impact near to the wind turbine could be observed.
Cross-check:	During on-site visit the village head of Mahmudiye Village, Mr. Recep Eken /I/ has been interviewed. He mentioned that residents of Mahmudiye Village have complained about noise impact from the nearest wind turbine T 3. It was confirmed by staff of Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP, that an accredited environmental lab will be subcontracted to conduct a noise measurement. Mitigation measures for the nearby housing (noise protection insulation) is under consideration in case the related noise requirements would be exceeded. The desk review of the Report No. TR –R-363-01-01, dated October 2010 “Auditing Environmental and Social Commitments of Çanakkale Wind Farm Project – October 2010” of AECOM Turkey /15/ performed during construction confirmed among others, that it was observed that the main noise generating activities were associated with the excavation activities at T13 turbine location. Other complaints of local people regarding noise impacts are not reported.
Data / Parameter:	SD-ID.4&5: Quality and quantity of employment a. Quality b. Quantity
Data unit:	a. Quality: i. Relevant health and safety precautions ii. Health and safety trainings given to personnel b. Quantity:

Description:	a. Quality: i. All safety equipment is available and used by personnel. No work accident has happened during the monitoring period. ii. Necessary trainings are given to the personnel regarding safety and emergency procedures. b. Quantity: According to the social security contribution documents of the Project, the project provides full time jobs for operational staffs, safety guards and cleaning personnel, all of them being local. Details are provided in the Monitoring Report (/7/,/9/) and in employment documents (/11/,/12/).
Source of data used:	a. Quality: i. Records of available safety equipment and accidents ii. Training certificates and attendance records (/13/,/14/) b. Quantity: The following confidential information on personnel is besides of the summarizing documents, mentioned above, the basis of the assessment: Residence Records /12/, Personnel Social Security Records /11/,
Means of verification, Comments:	a. Quality: i. The working environment and working conditions have been examined during on-sit visit. It can be concluded that they were in a positive shape, which includes no delays in payment of salary/wages and full health insurance coverage. ii. The documents about provided training have been verified. It can be concluded that the employees of Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP (Operator Technicians of High Voltage Switchgear Centre, Security Personnel) and of Siemens WP PS (Service Technicians) are frequently trained for their specific tasks. b. Quantity: The number of permanent local employment is counted. Residence records of the project personnel are checked.
Cross-check:	a. Quality: i. Storage of personal safety equipment has been checked and found in good condition. The available safety equipment include safety rope, rescue rope, working clothes, protection glasses, safety shoes, helmets, medicine box and fire extinguishers. ii. Training certificates and attendance records are checked, the staff present at the day of the onsite assessment was interviewed and information of training certificates could be confirmed as correct. b. Quantity: The staff present at the day of the onsite assessment was identified as the personnel described according to the payrolls and in the organigram /32/, see list of interviewed persons under chapter

It can be concluded that as a result all Sustainable Development Indicators have been properly recorded and no negative deviations with regard to the target of the selected parameters can be reported. The interviews with several stakeholders during the on-site assessment have not resulted in any complaints, the overall feedback to the project was positive.

Hence, the project activity contributes positively to the sustainable development in Turkey.

3.3.2 Monitoring responsibility

A Technical Team of Enerjisa Enerji Üretim A.Ş. under supervision of Mr. Nihat Arı, the Operations Director and Mr. Özgür Çelebi. Process Engineer of Enerjisa Enerji Üretim A.Ş. and further guidance of the internal carbon specialist Mrs. Sıla Kılıç is responsible for the day-to-day monitoring of the project activity with regard to electricity generation and CO₂ reduction, see organogram in the monitoring report.

This Technical Team will also be responsible for monitoring of selected Sustainable Development Indicators for meeting the Gold Standard requirements for GS-VER projects.

All critical data are either measured or calculated and will be kept on site for the duration of the crediting period and 2 years. On a monthly basis, the technical team will review the performance of the project activity and annual audits with the carbon consultant will be scheduled prior to the periodic verifications by a DOE. All relevant procedures and work instructions have been developed based on the manufacturer's technical specifications and have been implemented accordingly. Mr. Halil Gencel as shift leader and Mr. Kadir Durmaz as operation technician of Çanakkale Wind Power Plant are responsible for monitoring issues on site.

The responsible engineers on site send the electricity generation report every week and the meter reading protocol every month to Enerjisa Enerji Üretim A.Ş.

The staff of. Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP supported by Siemens WP PS has shown his capability to operate and maintenance the plant. There is a Service & Maintenance Contract between the plant operator and Siemens WP PS. This contract strengthens the sustainability and reliability of the project as well. Regular training like specific High Voltage Training and Occupational Health and Safety Training is provided to the staffs of Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP

In summary it can be concluded by the verification team of TÜV Rheinland that the monitoring plan and relevant procedures reflect good engineering and monitoring practise appropriate to the project type. After several interviews during the on-site visit the verifier is confident and can confirm that the project participant, assisted by the internal carbon specialists was able to implement the monitoring plan as per the requirements of the applied monitoring methodology, the VVS and the Gold Standard requirements. Accuracy of equipment

The accuracy of the meters is very high as given in the “Communiqué regarding the Meters to be used in the Electricity Market (TEİAŞ)” /43/, as stated below.

This will not form a significant source of uncertainty.

Capacity of the circuit, where the meter is connected	Larger than 100 MVA	Between 100 and 10 MVA (inclusive)	Less than 10 MVA
Active energy meters	IEC-EN 60687 0.2S class	IEC-EN 60687 0.5S class	IEC-EN 60687 0.5 class
Reactive energy meters	**IEC-EN 61268 0.2S class	**IEC-EN 61268 0.2S class	**IEC-EN 61268 0.2S class

The verification team has checked the installed bi-directional meters:
Both meters fulfil the above requirements:

Function	Serial Number	Device Model	Manufacturer	Model Year	Date of Calibration	Accuracy
Main Meter	53035219	SL761A071	ACTARIS	2009	21/04/2009	0.2 S
Back-up Meter	35004263	SL761BXXX	ACTARIS	2009	03/08/2009	0.5 S

TEİAŞ, the grid company, is responsible for calibration and maintenance of the devices. The calibration frequency is established based on national requirements/standards /45/, that means every 10 years.

The data presented in the monitoring report (/7/,/9/) were assessed by reviewing project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipments. Sufficient evidence was presented for the reported emissions reductions and could be verified by TÜV Rheinland's verification team. The emission reduction calculations are complete and transparent, and TÜV Rheinland's verification team was able to confirm their plausibility and accuracy.

3.3.3 Deviation from and Revision of the registered monitoring plan

No such deviation has been identified.

3.4 Assessment of data and calculation of greenhouse gas emission reductions

The Power Export and Import data are based on protocols signed by TEIAS and the Project owner. These protocols are used as the basis of PMUM reports and invoicing.

The invoices are kept by the Project owner as hardcopies. Furthermore, the PMUM system stores the reports electronically, which is accessible to the Project owner whenever necessary.

After the monthly reports are obtained from PMUM, data are aggregated using a separate spreadsheet prepared by Mavi Consultants. The monthly generation and consumption data are entered to the spreadsheet, which automatically calculates the emission reductions during the monitoring period. This spreadsheet file (/8/,/10/) is attached in the Annex of the monitoring report (/7/,/9/).

The procedure of data generation, aggregation, calculation and reporting are managed by the responsible people stated above in chapter 3.3.2.

The baseline calculations and emission reduction calculations are carried out electronically with a spreadsheet; therefore the calculations are transparent, traceable and of high quality.

All data in the monitoring report were cross-checked by the verification team with regard to consistency with the daily records in the logbook, the monthly meter reading protocols signed by staffs of Enerjisa Enerji Üretim A.Ş./ Çanakkale WPP and TEİAŞ, the monthly PMUM reports and the monthly invoices. All electricity data and subsequent emission reduction calculations were found appropriate and plausible without any deviations or errors. The necessary defined information/process flow, data transfer and data trails, the necessary procedures were also checked during onsite assessment. The excel spreadsheet (/8/,/10/) was also cross-checked in detail. The data collection, transfer and processing were checked along with the calculations within the excel sheet.

The emission factor was calculated according to the baseline methodology ACM0002, version 13,0.0 /33/. The applied combined margin baseline emission factor of the Turkish Public Grid of 0.610 tCO₂,eq/MWh, has been determined ex-ante and fixed for the first crediting period. The verifier confirms that all the data have been correctly applied.

3.5 Issues remaining from the previous verification period

There was no previous verification period, therefore this chapter is only applicable in the next periodic monitoring periods and related verification reports.

3.5 Issues stemming from GS issuance and GS registration review feedback

N/A, as it is already resolved and hence closed during previous verifications.

3.6 Continuous Inputs / Grievance Mechanism Applied

In case of any complaint, local people can report their complaints via telephone or visit directly to the plant. In case of any complaint, plant manager is reported about the problem and received complaints are entered into the company reporting system which is called QDMS. So the thought of stakeholders are monitored periodically. It was reported that at Çanakkale Wind Power Plant there was no complaint received so far. During interview with the village head of Mahmudiye village Mr. Recep Eken on 20th of April a noise issue was reported, see chapter 3.2.1, SD-ID.3. Relevant actions have been taken.

Appendix A

GS-VER Verification protocol

“ÇANAKKALE WPP” (TURKEY) (GS-NO. 906)

to Verification Report No. 2122 8472 A, Version No. 1.0

Table 1: Verification requirements

(based on §250 - §328 of the CDM Validation and Verification Standard, Version 07.0)

Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1. Implementation					
1.1 Have all physical features proposed in the registered PDD been implemented at the project site?			Yes	OK	OK
1.2 Has the project activity been operated in accordance with the project scenario described in the registered PDD and relevant guidance?			Yes	OK	OK
1.3 If the project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site?			N/A	-	-
2. Monitoring plan and methodology					
2.1 Is the monitoring plan established in accordance with the monitoring methodology?			Yes	OK	OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has any requests for revision to or deviation from the monitoring methodology been officially communicated to the GS-TAC?			N/A	-	-

¹ MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
2.2.1 Have the above changes to the monitoring plan been approved by the GS-TAC?			N/A	-	-
3. Monitoring and the monitoring plan					
3.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered PDD (or new monitoring plan approved by the CDM EB)?			Yes	OK	OK
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?			Yes	OK	OK
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring results recorded as per approved frequency?			Yes	OK	OK
3.2.2 Was the monitoring equipment for baseline emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?			Yes, the installed electricity meters are calibrated by the manufacturer ACTARIS, the next periodic calibration has to be performed by the Grid-Operator TEİAŞ in accordance with /45/.	OK	OK
3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?			Yes	OK	OK
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?			Yes	OK	OK

Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?			N/A, only net electricity generation is monitored. The applied baseline and monitoring methodology ACM 0002 for wind projects does not account for any project emissions.	-	-
3.4 Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?			N/A, see 5.3.	-	-
3.4.1 Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?			N/A, see 5.3.	-	-
3.4.2 Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?			N/A, see 5.3.	-	-
3.5 Were all monitoring parameters available and verifiable through the whole monitoring period?			Yes	OK	OK
3.5.1 In case, only partial monitoring data is available and PP(s) provide estimations or assumptions for the rest of data, was it possible to verify those estimations and assumptions?			N/A	OK	OK
3.6 Was management and operation system established and operated in accordance with the monitoring plan?			Yes	OK	OK

Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.7 Was is it possible to verify that involved management and operation personal is fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals?			Yes	OK	OK
4. Parameters					
4.1 Monitored parameter Title: ID.: Net electricity generation = Electricity supplied by the project activity to the grid Indication: <i>EGy</i> Units: MWh Estimated value (<i>ex-ante</i>): Measured value (<i>ex-post</i>): X			See chapter 3.3.1. for further details. The resulting values have been checked and found plausible and correct after closing of a corrective action request.	CAR 1	OK
4.2 Default parameter Title: Combined Margin Emission Factor Indication: <i>EF_{grid,CM,y}</i> Units: tCO _{2,eq} /MWh Default/Used value: 0.610			The validated Combined Margin Emission Factor has been determined ex-ante and fixed for the first crediting period.	OK	OK

Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
4.3 Sustainable Development Indicator Title: ID.4&5: Quality and quantity of employment ID.3: Other pollutants (Noise emissions) ID.2: Human and institutional capacity ID.1: Soil condition Indication: Units: Estimated or target value (<i>ex-ante</i>): Measured value (<i>ex-post</i>):			The selected Sustainable Development Indicators have been cross-checked with Gold Standard, Version 2.1 Requirement, Toolkit and Annexes and with independent sources and could be justified, see chapter 3.3.1. of this report for further details.	OK	OK
5. Calculations					
5.1 Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?			The verification team confirms that appropriate formulae and methods have been used.	OK	OK
5.2 Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?			Yes	OK	OK
5.3 Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?			N/A for ACM 0002, as the energy generating equipments is not transferred from or to another activity. Hence the leakage emissions account to zero.	OK	OK

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)					
No.	Type of request	Observation	Reference (Table 1)	Summary of project owner response	Verification team conclusion
1.	CAR 1	Typo and calculation errors in excel sheet /8/ and monitoring report /7/.		The documents (/10/, /9/) have been revised.	OK
2.	CL				
3.					

Table 3: List of forward action requests (FARs)				
FAR number	Observation	Reference	Summary of project participants' response	Verification team conclusion (for next periodic verification)
FAR1	Prior to the next periodic verification it should be further elaborated in more detail, what have been the reasons for the underperformance in comparison to the wind energy yield predictions, as besides of the above mentioned technical failure no other malfunction, resettlement, repair service or any other relevant event with effects on the availability of the wind farm has occurred within this monitoring period.	/6/,/7/,/9/		

Appendix B

Certification statement

“ÇANAKKALE WPP” (TURKEY) (GS-NO. 906)

to Verification Report No. 2122 8472 A, Version No. 1.0

Certification statement

The verifier TÜV Rheinland has performed a periodic verification of the registered GS-VER project activity “ÇANAKKALE WPP” (GS-NO. 906). The project activity is designed to generate emission reductions by replacing the fossil fuel electricity generation with wind turbines. The verification was performed to identify the compliance of the project activity with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions.

The verification is based on:

- GS-VER PDD “Çanakkale WPP”, version 9, dated 04/09/2012 /1/;
- Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources”, Version 13.0.0 of 11/05/2012 /33/;
- Final Revised Monitoring Report of Çanakkale WPP, version 04.0 of 04/05/2015 /9/.

This statement covers verification period of 18 months between 01/10/2013 and 31/03/2015.

The verifier TÜV Rheinland has raised one Forward Action Requests which shall be addressed and verified during the next periodic verification.

The verifier TÜV Rheinland, herewith certifies that the project activity, achieved emission reductions by sources of GHG equal to 69,172 tCO₂, with the following vintages:

Year	Monitoring Period	Emission Reductions
2013	01/10/2013 to 31/12/2013	10,779 tCO _{2eq}
2014	01/01/2014 to 31/12/2014	42,918 tCO _{2eq}
2015	01/01/2015 to 31/03/2015	15,475 tCO _{2eq}
Sum in Total	01/10/2013 to 31/03/2015	69,172 tCO_{2eq}

All monitoring requirements have been fulfilled.

12/05/2015

Date



Norbert Heidelmann

Team Leader

12/05/2015

Date



Kurt Seidel

Team Member