



# VERIFICATION REPORT

for the GS VER Project Activity

## Kuyucak 25.6 MW Wind Farm Project, Turkey

in  
Turkey

Report No. 21218464-2012

Version 03, 2012-03-01

**I. Project data:**

<b>Project title:</b>	Kuyucak 25.6 MW Wind Farm Project, Turkey
<b>Registration No.:</b>	GS 576
<b>Monitoring period:</b>	11/11/2010 – 31/12/2011 including both days
<b>Methodology:</b>	ACM0002, version 07
<b>Verified emission reductions:</b>	47,993 tCO <sub>2</sub> e/yr
<b>GHG reducing measure/technology:</b>	Electricity generation by renewable wind power energy resource

**II. Verification data:****Verification team**

<b>Role</b>	<b>Full name</b>	<b>Appointed for Sectoral Scopes</b>	<b>Affiliation</b>
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**III. Verification report data:**

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## Verification opinion — summary

The verification team assigned by the DOE - TÜV Rheinland concludes that the GS VER project activity “Kuyucak 25.6 MW Wind Farm Project, Turkey” (GS 576), as described in the registered PDD (version 10, 14/03/2011) and monitoring report (version 1.3, 01/03/2012), meets meet all relevant requirements of the Gold Standard for VER project activities.

The verification has been performed as described in the GS VVM and constitutes the following steps:

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 project activity was correctly implemented according to selected monitoring methodology and the registered 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. The DOE therefore is pleased to issue a positive verification opinion expressed in the attached Certification Statement.

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## 1. Introduction

The MAVI Consultants has commissioned the DOE - TÜV Rheinland to perform a verification of the GS VER Project Activity “Kuyucak 25.6 MW Wind Farm Project, Turkey” (GS 576), (hereafter “project activity”). This report summarises the findings of the verification of the project, performed on the basis of relevant Gold Standard requirements, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the GS Board. Verification is required for all registered GS VER project activities intending to confirm their achieved emission reductions and proceed with request for issuance of VERs.

### 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.

In particular, monitoring plan, monitoring report and the project’s compliance with relevant GS 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 11/11/2010 to 31/12/2011 including both days, based on registered GS PDD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

On-site visit and stakeholders interviews are also performed as part of the initial verification process.

## 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:

Nr.	Document
/DOC1/	Spreadsheet of ER calculation
/DOC2/	Organizational structure of the project owner
/DOC3/	Training record and qualification certificate of staff
/DOC4/	PMUM data record for electricity supplied to the grid and drawn from the grid
/DOC5/	Project owner's record protocol for electricity supplied to the grid and drawn from the grid
/DOC6/	Invoice issued by the project owner
/DOC7/	Technical specification and calibration record of meters
/DOC8/	Employee information: - Personal data - Social security registries - Residence certificates
/DOC9/	Operation / generation license of the project activity
/DOC10/	Noise measurement report

Nr.	Document
/DOC11/	Bird migration routes report
/DOC12/	Schematic circuit diagram of the project activity
/DOC13/	Technical specification of turbine
/DOC14/	Emergency plan
/DOC15/	Monitoring and operation manual
/DOC16/	Plant operation log book
/DOC17/	Record of operation duration of diesel generator during the monitoring period
/DOC18/	Calibration / Testing record of main and backup meter issued by the TEIAS on 23/10/2010
/DOC19/	Training certificates for operation of plant issued by the Enercon on 15/04/2011 and 22/08/2011

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

	Date	Name	Organization	Topic
/I1/	31/01/2012	Mr. Hasan Uyan	Alize Enerji Elektrik Üretim A.S.	<ul style="list-style-type: none"> <li>- Information regarding actual implementation of the project activity</li> <li>- Installation of monitoring system</li> <li>- Data flow monitoring system</li> <li>- Calibration of the electric meter</li> <li>- QA/QC procedure</li> <li>- Emergency procedure</li> <li>- Training on operation</li> <li>- SD indicators</li> </ul>
/I2/	31/01/2012	Mr. Mural Andic	Alize Enerji Elektrik Üretim A.S.	<ul style="list-style-type: none"> <li>- Monitoring management</li> <li>- QA/QC procedure</li> <li>- Emergency procedure</li> <li>- Date of commissioning of the power plant</li> <li>- Billing method for net power supply</li> <li>- SD indicators</li> </ul>
/I3/	31/01/2012	Mr. Ilyas Bayik	Alize Enerji Elektrik Üretim A.S.	<ul style="list-style-type: none"> <li>- Training on operation</li> <li>- SD indicators</li> </ul>
/I4/	31/01/2012	Mr. Ersan Saat	Resident of Halkakavlc Village	<ul style="list-style-type: none"> <li>- Opinion on the project</li> <li>- SD indicators</li> </ul>
/I5/	31/01/2012	Mr. Vefa Kent	Resident of Halkakavlc Village	<ul style="list-style-type: none"> <li>- Opinion on the project</li> <li>- SD indicators</li> </ul>
/I6/	31/01/2012	Mr. Metin Sungun	Resident of Oemirtas Village	<ul style="list-style-type: none"> <li>- Opinion on the project</li> <li>- SD indicators</li> </ul>

## 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 DOE's conclusions 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 GS VER project is expected to meet;
- It ensures a transparent verification process where the DOE 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 DOE 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 GS 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 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 participant. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for GS validation and verification.

## 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 verification are documented in detail in the verification protocol in Appendix A.

### 3.1 Project implementation

#### 3.1.1 The implementation of the project activity

By means of desk review and on-site observation, the verification team confirms the installed physical facilities of the project activity as follows:

<b>Actual implementation of the project activity</b>	<b>Consistency with the registered GS PDD</b>	<b>Assessment by the verification team</b>
The project activity is located in Kuyucak region, Manisa province, Turkey. The GPS coordinates of the project activity is 39° 17' N, 27° 53' E approximately.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The project location reported in the MR has been checked by means of on-site assessment. Furthermore, the GPS coordinates has been verified via Google Earth (version 6.1.0.5001).
Technical specification of wind turbines: <b>Model: Enercon E70</b> <ul style="list-style-type: none"> <li>- Unit: 12</li> <li>- Installed capacity: 2 MW of each wind turbine</li> <li>- Specification: Gearless, variable speed, variable pitch control</li> </ul> <b>Model: Enercon E40</b> <ul style="list-style-type: none"> <li>- Unit: 2</li> <li>- Installed capacity: 0.8 MW of each wind turbine</li> <li>- Specification: Gearless, variable speed, variable pitch control</li> </ul> The total installed capacity of wind turbines is 25.6 MW = (12 * 2 MW + 2 * 0.8 MW)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The wind turbines were observed by the verification team during the on-site assessment. It is confirmed that the technical specification of generator is consistent with information in the registered GS PDD and monitoring report.

<b>Actual implementation of the project activity</b>	<b>Consistency with the registered GS PDD</b>	<b>Assessment by the verification team</b>
Installation of main meter <ul style="list-style-type: none"> <li>- Location: At substation controlled by TEİAŞ</li> <li>- Accuracy: 0.2s</li> <li>- Calibration frequency: Each 10 years</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The main meter was observed by the verification team during the on-site assessment that the meter has been installed at the substation and is controlled by the grid company. It measures amount of electricity supplied to the grid and drawn from the grid. Therefore, it is confirmed that installation of the main meter is in accordance with description in the registered GS PDD.
Installation of backup meter <ul style="list-style-type: none"> <li>- Location: At substation controlled by TEİAŞ</li> <li>- Accuracy: 0.2s</li> <li>- Calibration frequency: Each 10 years</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The backup meter was observed by the verification team during the on-site assessment that the meter has been installed at the substation and is controlled by the grid company. It measures amount of electricity supplied to the grid and drawn from the grid in case of malfunction of the main meter. Therefore, it is confirmed that installation of backup meter is in accordance with description in the registered GS PDD.

In summary, the verification team confirms that the installation of the equipments and facilities is in consistency with the registered GS PDD and no deviation from the original monitoring plan has been found.

### 3.1.2 The actual operation of the GS VER project activity

The timeline of the project's implementation is as follow:

<b>Milestone of the project activity</b>	<b>Timeline</b>	<b>Assessment by the verification team</b>
Starting date of operation	11/11/2010	During the on-site assessment, the plant operation log book was reviewed by the verification team, it is confirmed that the project activity started operation and supplying electricity to the grid on 11/11/2010.
Registration of the project activity	15/04/2011	Please refer to GS Registry for more

<b>Milestone of the project activity</b>	<b>Timeline</b>	<b>Assessment by the verification team</b>
as GS VER		details: <a href="https://gs1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=576">https://gs1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=576</a>
Current crediting period	11/11/2010 – 10/11/2017	Please refer to GS Registry for more details: <a href="https://gs1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=576">https://gs1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=576</a>
Current monitoring period	11/11/2010 – 31/12/2011	The project activity in the current monitoring period is under verification.

In summary, the monitoring period is reasonable and the actual implementation of the project activity is appropriate to its development as GS VER.

### 3.2 Compliance of the monitoring plan with the monitoring methodology

By means of reviewing the monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (version 07), the registered monitoring plan and the monitoring report, the verification team confirms that monitoring plan applied in compliance with the monitoring methodology.

### 3.3 Compliance of the monitoring with PDD and monitoring plan

The verification team carried out the following activities to confirm that the actual monitoring activity at site is in compliance with the monitoring plan of the registered GS PDD and the reductions in GHG emissions claimed for the monitoring period are conservative.

#### 3.3.1 Monitored parameters

According to registered monitoring plan as documented in the registered GS PDD, the following parameters need to be monitored:

##### **EG (Net electricity supplied to the grid)**

<b>Item</b>	<b>Description</b>	<b>Assessment by the verification team</b>
Monitoring equipment	The main electric meter The backup electric meter	The main and backup electric meters are bi-directional meters which directly measure both electricity supplied to the grid and drawn from the grid. As described in section 3.1.1 of this report, the main and backup electric meters have been installed at the substation and are controlled by the grid company - TEİAŞ. The backup meter serves as cross checking of monitoring data by the main meter and its data will only be used for ER calculation if the main meter has malfunction.

<b>Item</b>	<b>Description</b>	<b>Assessment by the verification team</b>
Frequency of measurement	Continued measurement	By means of on-site observation, the verification team confirms that raw data has been measured by both the main meter and back up electric meter continuously.
Data record	PMUM data record	The amount of net electricity supplied to the grid from 11/11/2010 to 31/12/2011 including both days was based on the main meter's measurement record which is verifiable to PMUM record issued by the grid company. /DOC4/ Furthermore, the PMUM record has been checked against the paid invoice /DOC6/ and project owner's internal record /DOC5/. The verification team confirms that the PMUM data record used for emission reduction calculation is reliable.
Frequency of data record	Monthly record	The PMUM data is reported by the grid company on a monthly base from 00:00 on the first day to 24:00 on the last day of each month. /DOC4/

### 3.3.2 Monitoring responsibility

By means of interview with Mr. Hasan Uyan who is station manager of Kuyucak 25.6 MW Wind Farm Project /I1/, the verification team is convinced that the project owner's management and operational procedure is in accordance with the registered monitoring plan. The project monitoring organization was established and operated from the start of the project and responsibilities of the relevant staffs have been stipulated in the operation and monitoring manual. /DOC15/ Training on operation of the project activity and monitoring arrangement has been given to the responsible personnel prior to the start of the project operation. /DOC3/ Furthermore, qualification certificates of relevant operation staffs have been reviewed by the verification team during the on-site assessment to be effective. /DOC19/

### 3.3.3 Accuracy of equipment

According to registered monitoring plan, monitoring equipments have been installed in the project activity. The verification team observed the monitoring equipments during the on-site assessment and summarizes their technical specifications in the table below:

	<b>The main meter</b>	<b>The backup meter</b>
<b>Function</b>	Electric meter (bi-directional)	Electric meter (bi-directional)

	The main meter	The backup meter
<b>Ownership</b>	Project owner	Project owner
<b>Controlling</b>	Grid company	Grid company
<b>Location</b>	Outlet of substation (154 kV high voltage)	Outlet of substation (154 kV high voltage)
<b>Monitored parameter</b>	EG (both electricity supplied to the grid and drawn from the grid)	EG (both electricity supplied to the grid and drawn from the grid)
<b>Type</b>	ELSTER A1500	ELSTER A1500
<b>Serial number</b>	401681	401680
<b>Accuracy</b>	0.2s	0.2s
<b>Initial calibration</b>	17/11/2009	17/11/2009
<b>Frequency of calibration</b>	Each 10 years	Each 10 years
<b>Relevant national standard</b>	TS EN 62056-21 fulfilled	TS EN 62056-21 fulfilled

In summary, the verification team is able to verify that the accuracy the monitoring equipments were set according to the registered monitoring plan and relevant national standard in Turkey - TS EN 62056-21. Furthermore, calibration of mentoring devices was carried out according to the monitoring plan, manufacturer specifications and relevant national standard in Turkey - TS EN 62056-21. Therefore, accuracy of monitoring equipments is assured.

#### 3.3.4 Deviation from and Revision of the registered monitoring plan

Not applicable to the project activity

### 3.4 Assessment of data and calculation of greenhouse gas emission reductions

According to the ACM0002 (version 07), emission reductions are calculated as follow:

$$ER_y = BE_y - PE_y - LE_y$$

where:

$ER_y$  = Emission reductions in year y (t CO<sub>2</sub>e/yr)

$BE_y$  = Baseline emissions in year y (t CO<sub>2</sub>e/yr)

$PE_y$  = Project emissions in year y (t CO<sub>2</sub>e/yr)

$LE_y$  = Leakage emissions in year y (t CO<sub>2</sub>e/yr)

#### **Assessment of $BE_y$ :**

As per ACM0002 (version 07) and the registered GS PDD, baseline emissions are calculated to be amount of net electricity supplied to the grid by the proposed project activity (EG) multiplying emission factor of the grid ( $EF_{grid,CM,y}$ ). The verification team confirms that emission factor of Turkish National Grid was ex-ante determined to be 0.635 tCO<sub>2</sub>e/MWh at the validation stage. As per “Tool to calculate the emission factor for an electricity system” (Version 1.1)”, the emission factor is valid for the crediting period and no monitoring is required. Thus, emission factor of 0.635 tCO<sub>2</sub>e/MWh is justified.

The net electricity supplied to the grid was measured by the main meter which is a bi-directional meter. The main meter measures both electricity supplied to the grid and drawn from the grid. The difference between both figures is amount of net electricity supplied to the grid. The data used for ER calculation is sourced from PMUM record issued by the grid company and cross-checked with other verifiable evidence to be correct. The table below lists the verified data:

<b>Monitoring Period</b>	<b>Electricity supplied to the grid (KWh)</b>	<b>Electricity drawn from the grid (KWh)</b>	<b>Net electricity supplied to the grid (KWh)</b>
11/11/2010-30/11/2010	715,641	4,706	710,935
01/12/2010-31/12/2010	3,048,137	1,588	3,046,549
01/01/2011-31/01/2011	3,524,517	3,419	3,521,098
01/02/2011-28/02/2011	4,824,106	1,074	4,823,032
01/03/2011-31/03/2011	5,823,008	514	5,822,494
01/04/2011-30/04/2011	6,655,854	260	6,655,594
01/05/2011-31/05/2011	4,557,780	1,068	4,556,712

01/06/2011-30/06/2011	4,215,444	2,235	4,213,209
01/07/2011-31/07/2011	4,486,089	353	4,485,736
01/08/2011-31/08/2011	9,654,796	0	9,654,796
01/09/2011-30/09/2011	7,833,614	161	7,833,453
01/10/2011-31/10/2011	6,396,459	1,496	6,394,963
01/11/2011-30/11/2011	7,726,315	1,115	7,725,200
01/12/2011-31/12/2011	6,137,502	797	6,136,705
<b>Total</b>	<b>75,599,262</b>	<b>18,786</b>	<b>75,580,476</b>

The baseline emissions during the monitoring period from 11/11/2010 to 31/12/2011 including both days are calculated as follows:

<i>Monitoring period</i>	<i>EG (MWh)</i>	<i>EF<sub>grid,CM,y</sub> (tCO<sub>2</sub>e/MWh)</i>	<i>BE<sub>y</sub> (t CO<sub>2</sub>e)</i>
11/11/2010-30/11/2010	710.935	0.635	451.44
01/12/2010-31/12/2010	3,046.549	0.635	1,934.56
01/01/2011-31/01/2011	3,521.098	0.635	2,235.90
01/02/2011-28/02/2011	4,823.032	0.635	3,062.63
01/03/2011-31/03/2011	5,822.494	0.635	3,697.28
01/04/2011-30/04/2011	6,655.594	0.635	4,226.30
01/05/2011-31/05/2011	4,556.712	0.635	2,893.51
01/06/2011-30/06/2011	4,213.209	0.635	2,675.39
01/07/2011-31/07/2011	4,485.736	0.635	2,848.44
01/08/2011-31/08/2011	9,654.796	0.635	6,130.80
01/09/2011-30/09/2011	7,833.453	0.635	4,974.24

01/10/2011-31/10/2011	6,394.963	0.635	4,060.80
01/11/2011-30/11/2011	7,725.200	0.635	4,905.50
01/12/2011-31/12/2011	6,136.705	0.635	3,896.81
<b>Total</b>	<b>75,580.476</b>	<b>0.635</b>	<b>47,993 (Rounded down value)</b>

### **Assessment of PE<sub>y</sub>:**

According to ACM0002 (version 07), project emission for wind power generation project is not relevant. Nevertheless, diesel generator has been installed in the project activity in order to supply electricity to office building. This was also mentioned in the registered GS PDD.

By means of observation of nameplate, the verification team confirms that the output capacity of diesel generator is 24 KW. Hence, the highest emission factor of the diesel generator with installed capacity  $\geq 15 < 35$  kW as per approved CDM methodology AMS-I.F. (Version 02) of 1.9 kg CO<sub>2</sub>e/kWh can be referenced. During the current monitoring period, the diesel generator was in operation for 7 hours in total. This has been verified by means of reviewing project owner's internal record on operation hours of diesel generator. /DOC17/ Therefore, the emission caused by diesel generator has been calculated to be 0.3192 t CO<sub>2</sub>e (= 24KW \* 7h \* 1.9kg CO<sub>2</sub>e/kWh / 1,000) which makes up approximate 0.000665% of emission reductions generated in the current monitoring period. Therefore, the validation team is convinced that the greenhouse gas emissions caused by the diesel generator can be neglected and thus PE<sub>y</sub> = 0.

### **Assessment of LE<sub>y</sub>:**

According to ACM0002 (version 07) and registered GS PDD (version 10, 14/03/2011), leakage emission is neglected and thus L<sub>y</sub> = 0.

### **Emission Reductions (ER<sub>y</sub>):**

ER<sub>y</sub> = BE<sub>y</sub> = **47,993** tCO<sub>2</sub>e over the monitoring period from 11/11/2010 to 31/12/2011 including both days.

The verification team checked the emission reductions (47,993 tCO<sub>2</sub>e) against the registered GS PDD estimate value (71,578 tCO<sub>2</sub>e) and found that the verified emission reductions are lower than the estimated value in the registered GS PDD. Therefore, additionality of the project activity remains.

## **3.5 Issues remaining from the previous verification period**

1 FAR was issued by the DOE during the validation process. Moreover, The GS association issued 1 FAR in respect of sustainable development indicator. The table below summaries the detail of FARs and assessment by the verification team:

### ***FAR issued by the validation DOE***

<b><i>Item</i></b>	<b><i>Description</i></b>
--------------------	---------------------------

FAR description	<p><i>“For Cataltepe wind farm it must be assured by micrositing and/or technical means that noise immission levels for housing zones (morning-afternoon-night of 65, 60, 55 dB(A)) will be met. This will be checked during first verification.”</i></p>
Assessment by the verification team	<p>The noise measurement was conducted by an independent third party – Cevre Analiz Saglik Hizmetleri ve Teknolojileri Ltd. Sti. who is also an accredited entity (Accreditation No. AB-0079-T) on 08/12/2010. The measurement records and detailed presentation of measurement as well as a conclusion are well documented by the expert. /DOC10/ By means of reviewing the noise measurement report /DOC10/, the verification team confirms that the measurement was conducted at the closest settlement in accordance with Turkish National Standard - TS EN 61672 and noise level measured (immission value) is in line with Turkish national legal noise thresholds of 65 dB(A) in the morning - 60 dB(A) in the afternoon and 55 dB(A) at night.</p> <p>Moreover, the verification team interviewed the local residents living in vicinity of the wind turbines. /I4/ - /I6/ No negative impact on residents' daily life due to noise of wind turbines was identified. No complaint about noise immission was received by the verification team during the on-site assessment.</p>
Conclusion	<p>The environmental and social impacts caused by noise comply with GS requirements and relevant Turkish National Standard. The project owner's activity to avoid any negative impact has been checked by the verification team to be appropriate. Therefore, the FAR is closed.</p>

### ***FAR issued by the GS***

<b><i>Item</i></b>	<b><i>Description</i></b>
FAR description	<p><i>“A detailed investigation/ study by an independent third party should be prepared before the first request for issuance of credits for this project activity. The study should discuss whether the project site is in fact on a bird migration route or not and if it is, what mitigation measures will be undertaken during the migration season to ensure there is no negative impact on migrating birds. PP shall also monitor this parameter as per outcome of the proposed study.”</i></p>
Assessment by the verification team	<p>By means of reviewing &lt;Bird migration routes report&gt; /DOC2/ issued by an independent ornithologist – Mr. Bekir Derinöz in November 2011, the verification team confirms that the proposed project activity is located 200 km away from the major bird migration route, 125 km away from the first degree ancillary routes and 80 km away from the second degree ancillary routes. Therefore, the project does not affect migration of birds and hence does not have any negative impact on the bird migration routes.</p>

	<p>Nevertheless, warnings measure should be used in order to prevent possible hurt of birds. In doing so, it is suggested coloring the edges of rotor blades to red so that birds will be able to change their routes by noticing the wind turbines. During the on-site assessment, the verification team observed that edges of rotor blades have been colored to red in order to minimize any risk to hurt birds.</p> <p>Furthermore, the verification team also interviewed local residents living in the vicinity of the wind turbines that no killed bird was observed or founded since project's operation by local residents. Hence, it substantiates that the project activity does not have negative impact on bird migration.</p>
Conclusion	<p>The sustainable development indicator in respect of bird migration complies with GS requirements. As assessed above, the project activity is not located on route of bird migration and hence the indicator doesn't need to be further monitored. The FAR is closed.</p>

### 3.6 Contribution to sustainable development

The project activity contributes to the sustainable development of Turkey mainly by the means of job creation for local residents and improving air quality due to environmental technology of electricity generation. The project activity's implementation was assessed in terms of its contribution to sustainable development taking into account the validated SD Matrix and SD indicator monitoring plan. It was observed by the verification team that the project activity is in compliance with the SD Matrix and monitoring of relevant SD parameters was performed appropriately and adequately. No negative impact on the SD indicators was identified during the verification. The project fulfils the SD requirements of GS standard and the project participant monitored the SD indicators according to the registered monitoring plan. The tables below elaborate assessments of SD indicators according to the registered monitoring plan done by the verification team:

#### **ID2:**

<i>Item</i>	<i>Description</i>
Parameter	Quality and quantity of local employment
Assessment by the verification team	<p>By means of on-site interview, the verification team confirms that 8 full-time and 5 part-time jobs have been created by the project activity and these employees are the local people. Employees' personal data and their residence certificates /DOC8/ substantiate the number of local residents employed by the PP.</p> <p>Training records and training certificates of health and safety precautions; fire fighting; first aid and technical operation of wind power project have been reviewed by the verification team to be effective. /DOC3/, /DOC19/ Therefore, the verification team is convinced that the</p>

	quality of employment is ensure and improved by the relevant training.
Conclusion	Quality and quantity of local employment has been verified to be compliance with the registered monitoring plan and implemented by the project owner. The SD indicator is ensured.

**ID3:**

<b>Item</b>	<b>Description</b>
Parameter	SO <sub>2</sub> and NO <sub>x</sub> emissions reduction
Assessment by the verification team	<p>According to the identified baseline scenario of the project activity, the electricity generation from fossil fuel combustion and the related fuel consumption which relates to SO<sub>2</sub> and NO<sub>x</sub> emissions is replaced by the clean wind power energy source. The amount of emission reduction of SO<sub>2</sub> and NO<sub>x</sub> has been calculated by multiplying net electricity generation to the National Grid of Turkey with the SO<sub>2</sub> and NO<sub>x</sub> intensities of the grid.</p> <p>During the current monitoring period, 75,580,476 KWh electricity was supplied by the project activity to the National Grid of Turkey. /DOC4/ The SO<sub>2</sub> and NO<sub>x</sub> intensities were 4.07 kg/MWh and 2.50 kg/MWh respectively according to the latest National GHG inventory of Turkey which has been published at UNFCCC website. (<a href="http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2011-crf-14oct.zip">http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2011-crf-14oct.zip</a>)</p> <p>Hence, the SO<sub>2</sub> and NO<sub>x</sub> emissions during the current monitoring period have been calculated to be 307.5 tons and 189.3 tons respectively and checked by the verification team to be correct.</p>
Conclusion	SO <sub>2</sub> and NO <sub>x</sub> emissions reduction has been verified to be compliance with the registered monitoring plan. The SD indicator is ensured.

**ID4:**

<b>Item</b>	<b>Description</b>
Parameter	Emission from diesel consumption
Assessment by the verification team	During the on-site assessment, the verification team observed that a backup diesel generator with output capacity of 24 KW has been installed at the project site. By means of reviewing project owner's internal record on operation hours of diesel generator /DOC17/, the verification team confirms that the diesel generator was put into

	<p>operation 7 hours in total during the current monitoring period.</p> <p>In order to calculate emission from diesel consumption conservatively, the highest emission factor of the diesel generator with installed capacity <math>\geq 15 &lt; 35</math> kW as per approved CDM methodology AMS-I.F. (Version 02) of 1.9 kg CO<sub>2</sub>e/kWh was taken into account. Therefore, the emission caused by diesel generator has been calculated to be 0.3192 t CO<sub>2</sub>e (= 24KW * 7h * 1.9kg CO<sub>2</sub>e/kWh / 1,000) which makes up approximate 0.000665% of emission reductions generated in the current monitoring period.</p> <p>Therefore, the verification team is convinced that the greenhouse gas emission caused by the diesel generator is so small that can be neglected.</p>
Conclusion	Greenhouse gas emission caused by the diesel consumption during the current monitoring period was insignificant for the emission reductions and it can be neglected. The SD indicator is ensured.

**ID5:**

<b>Item</b>	<b>Description</b>
Parameter	Noise emission
Assessment by the verification team	<p>The noise measurement was conducted by an independent third party – Cevre Analiz Saglik Hizmetleri ve Teknolojileri Ltd. Sti. who is also an accredited entity (Accreditation No. AB-0079-T) on 08/12/2010. The measurement records and detailed presentation of measurement as well as a conclusion are well documented by the expert. /DOC10/ By means of reviewing the noise measurement report /DOC10/, the verification team confirms that the measurement was conducted at the closest settlement in accordance with Turkish National Standard - TS EN 61672 and noise level measured (immission value) is in line with Turkish national legal noise thresholds of 65 dB(A) in the morning - 60 dB(A) in the afternoon and 55 dB(A) at night.</p> <p>Moreover, the verification team interviewed the local residents living in vicinity of the wind turbines. /I4/ - /I6/ No negative impact on residents' daily life due to noise of wind turbines was identified. No complaint about noise immission was received by the verification team during the on-site assessment.</p>
Conclusion	The environmental and social impacts caused by noise comply with GS requirements and relevant Turkish National Standard. The project owner's activity to avoid any negative impact has been checked by the verification team to be appropriate. The SD indicator is ensured.

## **Appendix A**

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### **Verification protocol**

Kuyucak 25.6 MW Wind Farm Project, Turkey  
to Report No. 21218464-2012

**Table 1: Verification requirements**

(based on §56, §57 and §62 of the CDM Modalities and Procedures and on CDM Verification and Verification Manual, Annex 1 of EB55)

Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>1. Implementation</b>					
1.1 Have all physical features proposed in the registered PDD been implemented at the project site?	PDD MR	DR I	By means of on-site observation, the verification team checked actual implementation of the project and confirms all physical features have been implemented in accordance with the registered GS PDD.	OK	OK
1.2 Has the project activity been operated in accordance with the project scenario described in the registered PDD and relevant guidance?	PDD MR	DR I	Project's implementation fully complies with the registered GS PDD.	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?	PDD	DR I	Not applicable	OK	OK
<b>2. Monitoring plan and methodology</b>					
2.1 Is the monitoring plan established in accordance with the monitoring methodology?	PDD ACM0002	DR	The monitoring plan in particular of data monitoring, data record, data collection, data archive, data review, data transfer and QA/QC procedure are in accordance with ACM0002 (version 07)	OK	OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has	PDD	DR	Not applicable	OK	OK

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

Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
any requests for revision to or deviation from the monitoring methodology been officially communicated to the CDM EB? Reference: < <a href="http://cdm.unfccc.int/EB/033/eb33rep.pdf">http://cdm.unfccc.int/EB/033/eb33rep.pdf</a> >, §84, §58	MR	I			
2.2.1 Have the above changes to the monitoring plan been approved by the CDM EB?	PDD MR	DR I	Not applicable	OK	OK
<b>3. Monitoring and the monitoring plan</b>					
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)?	PDD MR	DR	Yes, the monitoring arrangement is in full compliance with the monitoring plan as documented in the registered GS PDD.	OK	OK
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	PDD MR	DR	As per ACM0002 (version 07) and registered monitoring plan, net electricity supplied to the grid is monitored to calculate the baseline emission.	OK	OK
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring results recorded as per approved frequency?	MR	DR I	The main meter (Serial No. 401681, Accuracy: 0.2s) is controlled by the grid company.	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?	MR	DR I	The main meter will be calibrated each 10 years that is prescribed by Turkish National Standard – TS EN 62056-21.	OK	OK
3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	MR	DR	The net electricity supply to the grid is monitored in accordance with registered monitoring plan and monitoring methodology.	OK	OK

Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?	MR	DR	Not applicable	OK	OK
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	MR	DR	Not applicable	OK	OK
3.4 Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	MR	DR	Not applicable	OK	OK
3.4.1 Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?	MR	DR	Not applicable	OK	OK
3.4.2 Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	MR	DR	Not applicable	OK	OK
3.5 Were all monitoring parameters available and verifiable through the whole monitoring period?	MR	DR I	All monitoring parameters are verifiable through the whole monitoring period.	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? Reference: < <a href="http://cdm.unfccc.int/EB/026/eb26rep.pdf">http://cdm.unfccc.int/EB/026/eb26rep.pdf</a> >, §109(b)	MR	DR	Not applicable, all monitoring parameters can be monitored directly and completely.	OK	OK

Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.6 Was management and operation system established and operated in accordance with the monitoring plan?	MR	DR I	By means of reviewing the monitoring and operation manual, the verification team confirms that the management and operation system is operated in accordance with the monitoring plan.	OK	OK
3.7 Was 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?	MR	DR I	The qualification certificates of operation staff has been reviewed by the verification team to be effective. Furthermore, training on operation of the project and monitoring arrangement has been given to the operation staff.	OK	OK
<b>4. Parameters</b>					
<b>4.1 Monitored parameter</b> Title: Electricity supplied to the grid Indication: EG Units: MWh Measured value ( <i>ex-post</i> ): 75,580.476 MWh from 11/11/2010 to 31/12/2011	MR	DR	Please refer to details as described in table 2	CAR-04	OK
<b>4.2 Default parameter</b> Title: Emission factor of the grid Indication: $EF_{grid,CM,y}$ Units: t CO <sub>2</sub> e/MWh Default/Used value: 0.635	MR	DR	As per registered GS PDD, the emission factor has been calculated by ex-ante method and thus the emission factor doesn't need to be monitored or recalculated for the current crediting period.	OK	OK
<b>5. Calculations</b>					
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?	MR	DR	Please refer to details as described in table 2	CAR-04	OK

<b>Checklist question</b>	<b>Ref.</b>	<b>MoV<sup>1</sup></b>	<b>Findings, comments, references, data sources</b>	<b>Draft conclusion</b>	<b>Final conclusion</b>
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?	MR	DR	Not applicable	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?	MR	DR	Not applicable	OK	OK

<b>Table 2: List of Requests for Corrective Action (CAR)</b>				
<b>No.</b>	<b>CAR</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Verification team conclusion</b>
1	Monitoring period reported in the monitoring report is not consistent with corresponding information in the spreadsheet for ER calculation. Corrective action is requested,	4.1 5.1	The monitoring period reflected in the spreadsheet is correct, whereas the monitoring report had not been updated accordingly. The correct monitoring period which is from 11/11/2010 to 31/12/2011 including both days has been reported in the monitoring report.	OK The correct monitoring period has been indicated in the final monitoring report and checked by the verification team to be appropriate. The CAR is closed.

## **Appendix B**

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Certification statement  
to the Verification Report 21218464-2012

## Certification statement

The DOE - TÜV Rheinland has performed a verification of the registered GS VER project activity “Kuyucak 25.6 MW Wind Farm Project, Turkey” (GS576). The project activity is designed to generate emission reductions by generation of electricity from renewable wind power energy resource.

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:

- Registered GS PDD (version 10, 14/03/2011);
- Registered validation report (Report No. CCP.VOL0362)
- Approved monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 07;
- Monitoring report (version 1.2, 07/02/2012).
- Monitoring report (version 1.3, 01/03/2012).


This verification statement covers monitoring period between 11/11/2010 and 31/12/2011.

The DOE has raised 1 corrective action request and it has been successfully resolved by the PP.

The DOE, herewith certifies that the project activity, achieved emission reductions by sources of GHG equal to **47,993** tCO<sub>2</sub> and all monitoring requirements have been fulfilled.

2012-03-01

Date



Mr. Norbert Heidelmann  
Technical Reviewer  
TÜV Rheinland Energie und Umwelt GmbH

2012-03-01

Date



Mr. You Cui  
Team Leader  
TÜV Rheinland Energie und Umwelt GmbH

## **Appendix C**

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Certificates of Competence

## Qualification

Cui, You /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No. :  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

ja

Qualification Level: Lead Auditor  
(Qualifikationsstufe)

External:  
(Externer)

ja

Add. reviewer:  yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)  
CDM 13 - Waste handling and disposal

Add. qualification:  
(zus. Qualifikation)

First Appointment:  
(Erstberufung)

04.09.2009

Valid to:  
(Gültig bis)

03.09.2012