



Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	Gunaydin WPP
Reference number of the project activity	GS1178
Version number of the monitoring report	03
Completion date of the monitoring report	15/08/2014
Registration date of the project activity	14/06/2013
Monitoring period number and duration of this monitoring period	1 st period 01/12/2012-31/12/2012 01/01/2013-31/12/2013 01/01/2014-30/04/2014(17 Months)
Project participant(s)	1- MANRES Elektrik Üretim A.Ş. (Private Entity, Project Owner) 2-Global Tan Energy Ltd. (Private Entity, Project Developer)
Host Party(ies)	Turkey
Sectoral scope(s) and applied methodology(ies)	Sectoral scope 1: Energy Industries (Renewable-/non-renewable sources) Applied methodology: ACM0002 v.13.0.0
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	2012 – 1,835 tCO ₂ e (01/12/2012-31/12/2012) 2013 – 22,020 tCO ₂ e (01/01/2013-31/12/2013) 2014 – 7,340 tCO ₂ e (01/01/2014-30/04/2014) Total:31,195 tCO₂e (17 months correlated)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	2012 – 1,773 tCO ₂ e (01/12/2012-31/12/2012) 2013 – 22,461 tCO ₂ e (01/01/2013-31/12/2013) 2014 – 7,503 tCO ₂ e (01/01/2014-30/04/2014) Total:31,737 tCO₂e (17 months)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	1,773 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	29,964 tCO ₂ e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project, operated by MANRES Elektrik Üretim A.Ş. (subsidiary of FINA Enerji Holding A.Ş.) was commissioned on 20/11/2012 with the license issued by EMRA on 11/11/2011.

Project activities involve the conversion of kinetic energy provided by the wind into mechanical and electrical energy by means of electromechanical equipment. For this purpose Gunaydin WPP currently consists of 5 GE turbines each having 2.5 MWm capacities with a total installed power of 10MWe, capped by the license. Electricity generated by the project is transmitted to the switchyard area via underground cabling and fed to the national grid via Mustafa Kemal Pasha Substation. 10-year average net annual electricity generation is estimated to be 36.7 GWh by the report prepared by GL Garrad Hassan with a probability of exceedance of 75%.¹

Main goals of the project include;

- Utilization of the renewable energy potential of Turkey in order to meet rapidly increasing electricity demand and contributing to build energy security.
- Increasing the share of WPPs in electricity generation mix of Turkey and reduction of GHG emissions.
- Contributing to the national economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduce import dependency of fossil fuel dominated electricity sector and diversify generation mix through use of local resources.
- Contribution to sustainable development through supporting local community and local economy.

In the current monitoring period a total of 52.897 GWh of electrical energy was generated which leads to a reduction of 31,737 tCO₂e GHG emissions.

In accordance with "Tool to Calculate the Emission Factor for an Electricity System" version 02.2.1 ; the combined margin emission factor to be applied had been calculated as 0.600 tCO₂/MWh in the registered project design document (PDD). Emission factor has been assumed to remain fixed during the first crediting period.

Milestones for the project activity is given below;

Milestone	Date
Preliminary EIA	February 2009
Contribution Fee Agreement	24/09/2011
License Issuance	11/11/2011
Collecting offers for carbon agreement	15/11/2011
EM Equipment Purchase Contract*	20/12/2011
Carbon Agreement	24/01/2012
EIA Exemption Letter	25/01/2012
License Revision	09/02/2012
LSC Meeting	21/02/2012
Connection Agreement	03/04/2012
Construction Subcontractor Agreement	03/04/2012
Forest Permission	20/04/2012
SFR Start Date	25/09/2012
Commissioning Date	20/11/2012
SFR End Date	31/12/2012
GS Registration Date	14/06/2013
1 st Verification Site Visit	20/05/2014

Table 1: Project Milestones

¹ GL Garrad Hassan Feasibility Report dated 20/01/2012 (Page 20)

A.2. Location of project activity

Project is located within the boundaries of Manyas district of Balıkesir Province. Nearest settlement to the project site is Yaylakoy Village (approximately 1 kilometer).

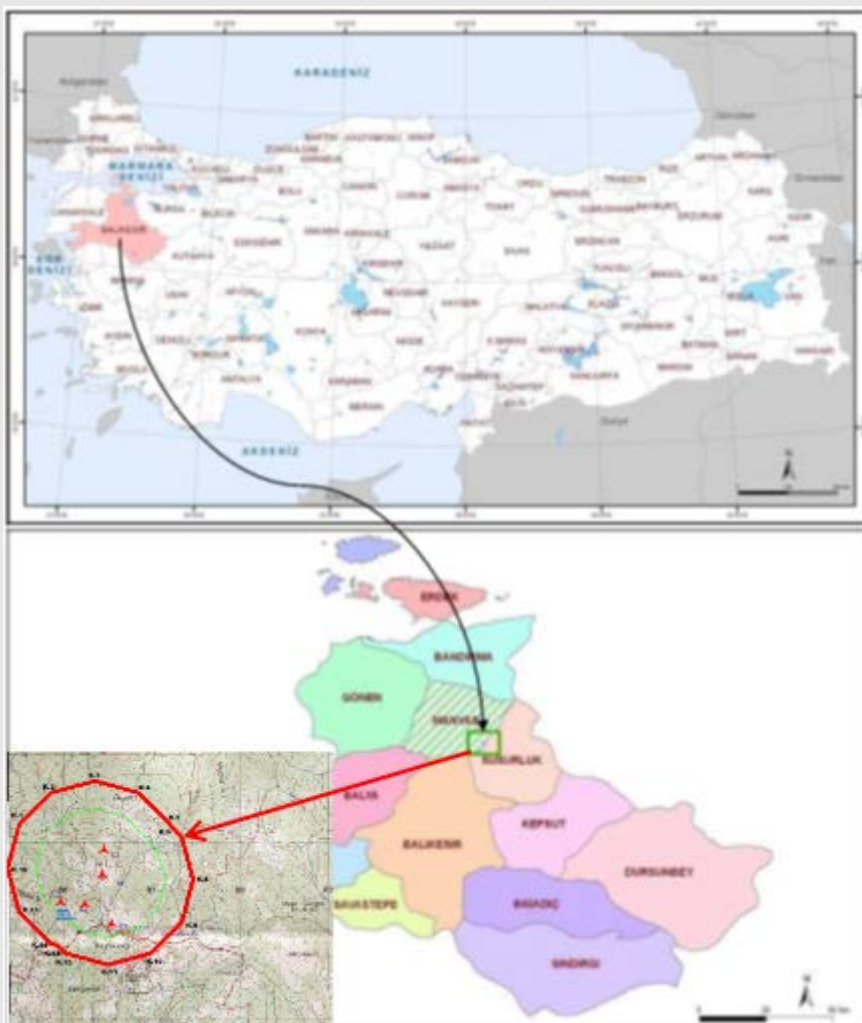


Figure 1: Project Location

Zone(35S)	Easting(m)	Northing(m)
T1	586478	4425918
T2	586566	4425088
T3	586463	4425636
T4	586268	4425305
T5	585994	4425329
Switchyard	586009	4425184

Table 2 : Turbine and Switchyard Coordinates

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (host)	1- MANRES Elektrik Üretim A.Ş. (Private Entity, Project Owner) 2-Global Tan Energy Ltd. (Private Entity, Project Developer)	No

A.4. Reference of applied methodology

The United Nations approved consolidated baseline methodology applicable to this project is ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", Version 13.0.0² has been applied for the project.

ACM0002 refers to the following tools:

- "Tool for the demonstration and assessment of additionality", Version 06.0.0³ and
- "Tool to calculate the emission factor for an electricity system", Version 02.2.1⁴

A.5. Crediting period of project activity

The project uses two times renewable crediting periods. (7 years, 0 months)

This is the first crediting period.(01/12/2012-30/11/2019)

Start date and length of the crediting period corresponding to this monitoring period:

01/12/2012-30/04/2014 (1 year, 5 Months)

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

Wind Power Plants use wind energy converters (WEC), called wind turbines to convert the wind energy into electrical energy. Average annual wind speeds measured at the project site at 85 meters hub height is 8.2 meters per second⁵. The project uses 5 WEC's of GE 2.5-100 MW however electrical output will be limited to 10MWe. The annual electricity generation from these turbines is estimated to be 37.6 GWh. This energy is converted to 34.5 kV at the site switchyard and connected to the national grid. Turbine specifications are given below.

² <http://cdm.unfccc.int/UserManagement/FileStorage/DYPFI935XBG274NWH6O8CM1KEZR0VU>

³ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf>

⁴ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf>

⁵ FSR page 15

Design Limits	
Rotor Diameter	100 m
Cut-in Wind Speed	3.0 m/s
Cut-out Wind Speed	25 m/s
Rated Power Output	2.5 MW
Minimum ambient temperature operation	-15 °C / -20°C
Maximum ambient temperature operation	+ 40 °C
Minimum Humidity	5 g/m ³
Maximum number of grid-induced disconnections per year	30
Maximum altitude with no deareting	1000 m
Tower	
Type	Tubular Steel Tower
Hub Height	85 m
Yaw System	
Yaw rate	0.5 °/sec
Rotor	
Diameter	100 m
Number of rotor blades	3
Swept area	7854 m ²
Rotor speed range	5-14 min ⁻¹
Rotational Direction	Clockwise looking downwind
Maximum speed of the blade tips	73.6 m/s
Orientation	Upwind
Speed regulation	Pitch-controlled
Aerodynamic brake	Blades in feathering position
Cone angle	3°
Inclination angle of rotor axis	4°
Rotor Blades	
Length (blade root – tip)	48.7 m
Pitch System	
Principle	Single blade pitch control
Main Gearbox	
Rated Power	2750 kW
Type	Multi-stage system
Lubrication	1 mechanical and 1 electrical pump
Brake System	
Primary brake system	Single blade pitch control
Secondary brake system	Single blade pitch control
Holding brake	Hydraulically driven brake caliper on high-speed shaft
Generator	
Type	Permanent magnet generator
Rated output	2640 KW
Rated speed	1650 min ⁻¹
Rated voltage	710 V
Apparent Power	2808 kVA
Frequency at rated output	110 Hz
Protection Class	IP54
Insulation Class	F
Function type	S1
Standard	EN 60034-1
Converter System	
Type	Voltage source converter
Rated voltage, line slide	690 V +/-10 %
Rated frequency	50 Hz / 60 Hz
Protection class of the electronics	IP54

Figure 2: Turbine specifications

During validation of the project, two FARs were identified by GS that needed to be addressed until the first verification of the project.

FAR#1 about ornithology report – This issue has been resolved by getting Nature Research Society to prepare a comprehensive ornithology report during the migration season in August-October 2012, allowing for enough days to monitor the extended effects. Also another report was prepared by ornithologist S. Levent Turan, who is also an instructor in Hacettepe University. The report extended the studies up to 2013 spring season and concluded that; depending on the experience and empirical monitoring studies for several projects in the region since 2009 as well as the Gunaydin WPP project in 2013, no significant threats to the migrating bird species have been identified and it has been observed that the project site is not on a preferred migration route for the birds.⁶

⁶ Ornithologic Ecosystem Assessment Report, by Prof. S. Levent Turan, Hacettepe University dated 2013. , p 13

FAR#2 about grievance mechanism and availability of the logbook – This issue has also been resolved by interviews during site visit. Also it was confirmed that the village head had possession of the logbook.

No FARs remain from the previous steps of GS Project cycle.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

No temporary deviations from registered monitoring plan or applied methodology is reported during the monitoring period.

B.2.2. Corrections

In the process of monitoring the electricity generated by the project activities; it was stated in the registered PDD that the remote reading records will be cross-checked against PMUM records. However, remote reading records are no longer signed by TEIAS (National Energy Transmission Company) operators and therefore they are not used as a reference document. Invoicing is based on PMUM records and as suggested in section B.7.3 of the registered PDD, PMUM records are used as basis of emission reduction calculations. As part of QA/QC activities, PMUM records are cross-checked against on-site metering records that have been logged by the plant operators. Therefore; The electricity generation and electricity consumption of the project activity is based on the PMUM records and the PMUM records are crosschecked against the monthly official electricity metering reports (OSF Forms) during this monitoring period.

Project owner supplies turbine related services from another private company. Therefore; planned trainings such as WPP Rescue Training, Working at Heights or Turbine Erection have been cancelled. These trainings are removed from possible future targets for SD parameter "Quality of Employment". However it is in sole authority of the project owner to re-schedule additional trainings along with the regulation wise mandated trainings.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

No permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.

B.2.4. Changes to project design of registered project activity

No changes to the project design of the project activity have been made during this monitoring period. Project owner plans to increase the capacity of the project by numbering up the turbines. Any changes in design will be reported and necessary alterations will be made as per the GS and CDM rules.

B.2.5. Changes to start date of crediting period

No changes to the start date of crediting period have been approved during this monitoring period or submitted with this monitoring report

B.2.6. Types of changes specific to afforestation or reforestation project activity

N/A.

SECTION C. Description of monitoring system

Monitoring plan has been applied according to the selected methodology(ACM0002). According to the applied methodology, all data collected as part of monitoring will be archived electronically and be kept at least for 2 years after the end of the last crediting period. Essential parameters will be monitored if not indicated otherwise in the tables below. All measurements will be conducted with calibrated measurement equipment according to relevant standards.

The results of the readings are saved electronically and made available by TEIAS via official website. Invoicing is based on the data published on the website.

The monitoring system organization chart is shown in Figure below, in which the authority and responsibility of project management are defined.

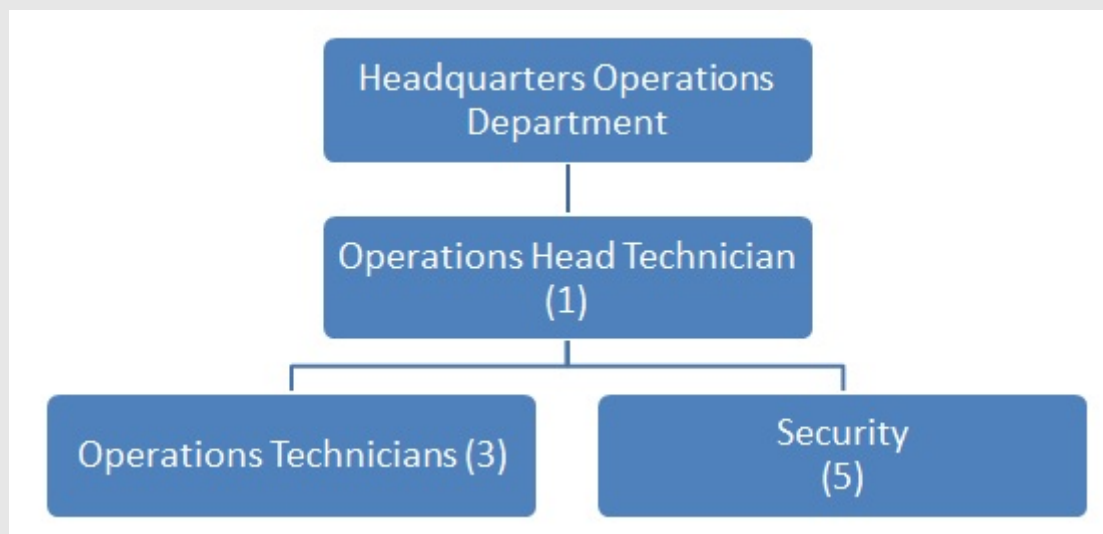


Figure 3: Monitoring System Organization Chart

Plant Manager (Operations Head Technician):

Operations head technician has been assigned as the overall responsible of compliance with VER monitoring plan. He is responsible for day to day running of plant, recording and monitoring of relevant data. Operation technicians will be assisting him with the gathering and reporting of the data.

Accounting Management (Headquarters Operations Department):

Since the company is a part of larger group, financial matters are managed from the headquarters. Operations Department is responsible for accounting, handling data about power sales, social security documents, invoicing and other personnel affairs.

GTE Carbon(Global Tan Enerji Ltd):

Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

Installation of meter and data monitoring has been carried out according to the regulations by TEIAS. Two metering devices (one of them used as spare) have been used for monitoring the electricity generated by the power plant as defined in PDD. Readings have been done using main metering devices and spare metering device will be used for comparison only. Data from metering devices is recorded by TEIAS monthly and formed the basis for invoicing. In addition to the two metering devices, generation of the Gunaydin WPP has been cross checked from TEIAS – PMUM web site (<http://pmum.teias.gov.tr>) which is accessible using a password provided to electricity generation companies.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	EG_y
Unit:	MWh
Description:	Net Electricity delivered to the grid by the project in year y
Source of data:	GL Garrad Hassan Feasibility Report
Value(s) applied):	36,700
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comment:	10-year average net annual electricity generation is estimated to be 36.7 GWh by the report prepared by GL Garrad Hassan with a probability of exceedance of 75%. ⁷

Data / Parameter:	EG_{y, Total}
Unit:	GWh
Description:	Net Electricity delivered to the grid by power plants in Turkey in year y
Source of data:	TEIAS Statistics ^{8 9}
Value(s) applied):	157,706.6 in 2008 151,144.7 in 2009 150,894.2 in 2010 459,745.428 GWh between 2008-2010
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comment:	Net generation figures for years are obtained by taking into account the losses and imports. Data also used for OM calculation

Data / Parameter:	EF_{CO₂, i, yi}																
Unit:	tCO ₂ /TJ																
Description:	CO ₂ emission factor of fossil fuel type i in year y																
Source of data:	Table 1.4 Chapter 1 Volume 2 of IPCC, 2006.																
Value(s) applied):	<table border="1"> <thead> <tr> <th>Fuel Source</th><th>EF(tCO₂/Tj)</th></tr> </thead> <tbody> <tr> <td>Coal</td><td>89.5</td></tr> <tr> <td>Lignite</td><td>90.9</td></tr> <tr> <td>Fuel Oil</td><td>75.5</td></tr> <tr> <td>Diesel</td><td>72.6</td></tr> <tr> <td>LPG</td><td>61.6</td></tr> <tr> <td>Naphtha</td><td>69.3</td></tr> <tr> <td>Natural Gas</td><td>54.3</td></tr> </tbody> </table>	Fuel Source	EF(tCO ₂ /Tj)	Coal	89.5	Lignite	90.9	Fuel Oil	75.5	Diesel	72.6	LPG	61.6	Naphtha	69.3	Natural Gas	54.3
Fuel Source	EF(tCO ₂ /Tj)																
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⁷ GL Garrad Hassan Feasibility Report dated 20/01/2012 (Page 20)

⁸ [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim\(22-45\)/35\(75-10\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/35(75-10).xls)

⁹ [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim\(22-45\)/33\(84-10\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/33(84-10).xls)

Additional comment:	According to the applied tool, IPCC default values at lower limit of 95% confidence interval can be used. Although, the actual emission reduction is expected to be higher due to high EF of fuels consumed in existing power plants, IPCC values have been used for conservativeness as requested by the methodology.
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Data / Parameter:	$\eta_{m,y}$																
Unit:	-																
Description:	Average net energy efficiency of power unit m in year y																
Source of data:	Default values provided by Annex I of "Tool to calculate the emission factor for an electricity system."																
Value(s) applied:	<table> <tr> <th></th><th>Generation Efficiency</th></tr> <tr> <td>Coal</td><td>39.0%</td></tr> <tr> <td>Lignite</td><td>39.0%</td></tr> <tr> <td>Fuel Oil</td><td>39.5%</td></tr> <tr> <td>Diesel</td><td>39.5%</td></tr> <tr> <td>LPG</td><td>39.5%</td></tr> <tr> <td>Naphtha</td><td>39.5%</td></tr> <tr> <td>Natural Gas</td><td>60.0%</td></tr> </table>		Generation Efficiency	Coal	39.0%	Lignite	39.0%	Fuel Oil	39.5%	Diesel	39.5%	LPG	39.5%	Naphtha	39.5%	Natural Gas	60.0%
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LPG	39.5%																
Naphtha	39.5%																
Natural Gas	60.0%																
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks																
Additional comment:	Data is selected as per the tool																

Data / Parameter:	$NCV_{i,y}$																
Unit:	Tj/kt																
Description:	Net Calorific Values of Fuel combusted in power plants.																
Source of data:	Table 1.2, Chapter 1, Volume 2, IPCC 2006 Inventory Guidelines (Lower limit value of the 95% confidence interval has been used for conservativeness)																
Value(s) applied:	<table> <tr> <th></th><th>NCV (Tj/kt) (1000m³ for gas)</th></tr> <tr> <td>Coal</td><td>22.26</td></tr> <tr> <td>Lignite</td><td>6.78</td></tr> <tr> <td>Fuel Oil</td><td>39.84</td></tr> <tr> <td>Diesel Oil</td><td>42.42</td></tr> <tr> <td>LPG</td><td>46.47</td></tr> <tr> <td>Naphtha</td><td>39.78</td></tr> <tr> <td>Natural Gas</td><td>37.06</td></tr> </table>		NCV (Tj/kt) (1000m ³ for gas)	Coal	22.26	Lignite	6.78	Fuel Oil	39.84	Diesel Oil	42.42	LPG	46.47	Naphtha	39.78	Natural Gas	37.06
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Natural Gas	37.06																
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks																
Additional comment:	-																

Data / Parameter:	$EF_{grid,CM,y}$
Unit:	tCO ₂ /MWh
Description:	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using "Tool to calculate the emission factor for an electricity system" ver. 02.2.1

Source of data:	Calculated using TEIAS Statistics and the capacity report that has been published by the same institute in 2011
Value(s) applied:	0.600
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comment:	Emission factor has been assumed to remain fixed during the first crediting period

D.2. Data and parameters monitored

Data / Parameter:	EG _{facility,y}																		
Unit:	GWh																		
Description:	Net Electricity generated and delivered to the grid by the project in year y																		
Measured/ Calculated / Default:	Calculated																		
Source of data:	Metering devices used in power plants, monthly records signed by TEIAS and plants manager and invoices are used.																		
Value(s) of monitored parameter:	$EG_{facility,2011}$ =2.955 $EG_{facility,2012}$ =37.436 $EG_{facility,2013}$ =12.506 Total : 52.897																		
Monitoring equipment:	Specifications of the metering devices are as follows: <table><tr><td>Manufacturer</td><td>Device Model</td><td>Serial Number</td><td>Last Calibration</td><td>Accuracy Class</td></tr><tr><td>ITRON(main)</td><td>SL7000</td><td>65000752</td><td rowspan="2">13.07.2012</td><td>0.5 S</td></tr><tr><td>ITRON(secondary)</td><td>SL7000</td><td>65000753</td><td>0.5 S</td></tr></table> Calibration tests were performed during this monitoring period on 13.07.2012. Results are presented in the calibration document.					Manufacturer	Device Model	Serial Number	Last Calibration	Accuracy Class	ITRON(main)	SL7000	65000752	13.07.2012	0.5 S	ITRON(secondary)	SL7000	65000753	0.5 S
Manufacturer	Device Model	Serial Number	Last Calibration	Accuracy Class															
ITRON(main)	SL7000	65000752	13.07.2012	0.5 S															
ITRON(secondary)	SL7000	65000753		0.5 S															
Measuring/ Reading/ Recording frequency:	Continuous measuring, monthly recording																		
Calculation method (if applicable):	Generation data will be recorded by two metering devices continuously. These records will provide the data for the monthly invoicing to TEIAS. This parameter is calculated by using the monthly gross generation and monthly internal consumption figures which are provided by the PMUM via remote reading. On-site metering records are used for cross-checking purposes and the most conservative data set is opted for calculations where available.																		
QA/QC procedures:	Maintenance and calibration of the metering devices will be made by TEIAS periodically. In case of significant difference between two devices, maintenance will be done before waiting for periodical maintenance according to regulations of TEIAS.																		
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks																		
Additional comment:	-																		

D.3. Implementation of sampling plan

Data and parameters above are not determined by a sampling approach.

SECTION E. Calculation of emission reductions or GHG removals by sinks**E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity and calculated as follows:

$$BE_y = (EG_{\text{facility},y} - EG_{\text{baseline}}) \cdot EF_{\text{grid},\text{CM},y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{\text{facility},y}$ = Electricity supplied by the project activity to the grid (MWh)

EG_{baseline} = Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero

$EF_{\text{grid},\text{CM},y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest available version of the "Tool to calculate the emission factor for an electricity system"

$$EG_{\text{facility},y} = 36.7 \text{ GWh}$$

$$EF_{\text{grid},\text{CM},y} = 600 \text{ tCO}_2/\text{GWh}$$

$$BE_y = (36.7 \text{ GWh}) \times (600 \text{ tCO}_2/\text{GWh}) = 22,020 \text{ tCO}_2\text{e (Ex-ante)}$$

Realized baseline emissions are calculated as follows:

$$EF_{\text{grid},\text{CM},y} = 600 \text{ tCO}_2/\text{GWh}$$

$$EG_{\text{facility},2012} = 2.955 \text{ GWh}$$

$$EG_{\text{facility},2013} = 37.436 \text{ GWh}$$

$$EG_{\text{facility},2014} = 12.506 \text{ GWh}$$

$$BE_{2012} = (2.955 \text{ GWh}) \times (600 \text{ tCO}_2/\text{GWh}) = 1,773 \text{ tCO}_2\text{e}$$

$$BE_{2013} = (37.436 \text{ GWh}) \times (600 \text{ tCO}_2/\text{GWh}) = 22,461 \text{ tCO}_2\text{e}$$

$$BE_{2014} = (12.506 \text{ GWh}) \times (600 \text{ tCO}_2/\text{GWh}) = 7,503 \text{ tCO}_2\text{e}$$

$$\text{TOTAL: } 31,737 \text{ tCO}_2\text{e}$$

Since the project is a greenfield project, EG_{baseline} is considered zero

E.2. Calculation of project emissions or actual net GHG removals by sinks

The project activity involves the generation of electricity by a wind power plant therefore project activity does not result in greenhouse gas emissions.

$$PE_y = 0$$

E.3. Calculation of leakage

The energy generating equipment is not transferred from or to another activity. Therefore leakage is also considered as "0".

$$LE_y = 0$$

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂e/yr)

PE_y = Project emissions in year y (t CO₂/yr)

LE_y = Leakage emissions in year y (t CO₂/yr)

$$ER_y = 31,737 - 0 - 0 = 31,737 \text{ tCO}_2\text{e}$$

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	31,737	0	0	31,737

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	2012 – 1,835 tCO ₂ e (01/12/2012-31/12/2012) 2013 – 22,020 tCO ₂ e (01/01/2013-31/12/2013) 2014 – 7,340 tCO ₂ e (01/01/2014-30/04/2014) Total: 31,195 tCO₂e (17 months correlated)	2012 – 1,773 tCO ₂ e (01/12/2012-31/12/2012) 2013 – 22,461 tCO ₂ e (01/01/2013-31/12/2013) 2014 – 7,503 tCO ₂ e (01/01/2014-30/04/2014) Total: 31,737 tCO₂e (17 months)

E.6. Remarks on difference from estimated value in registered PDD

Estimated and realized emission reduction amounts are quite in agreement. Wind energy is believed to be very consistent in the long term but might show little deviations in the monthly figures. Generated electricity is directly affected by the wind speed and seasonal effects. Since the annual generation estimations are based on a whole year and the monitoring report involves partial years, the differences are acceptable. As per the ex-ante calculations in the registered PDD, emission reductions corresponding to 17 months have been calculated as 31,195 tCO₂e. In the current monitoring period between 01/12/2012 and 30/04/2014 the realized emission reductions have been observed to be 31,737 tCO₂e, slightly exceeding the expected amount. The deviation from the estimations was found to be 1.74 %. And the realized emission reductions are proved to be 101.74 % of the expected amount. No major failure or operational breakdown has been experienced during this monitoring period.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO ₂ e)	1,773	29,964

ANNEX-I

Monitoring of Sustainable Development Parameters:

Indicator		Air Quality
Mitigation measure		N/A
Chosen Parameters		1- SO ₂ emissions from grid connected plants 2- NO _x emissions from grid connected plants
Current Situation of the Parameters		Total SO ₂ emission related to electricity generation is about 167.89 Gg in 2012 according to National Inventory of Turkey ¹⁰ . Considering that electricity generation in 2012 is 239,496.8 GWh ¹¹ , SO ₂ emission per MWh is calculated as 0.70 kg/MWh. Total NO _x emission related to electricity generation is about 324.30 Gg in 2012 according to National Inventory of Turkey. NO _x emission per MWh is calculated as 1.35 kg. In parallel to the electricity generation, actual SO ₂ emission reduction has been realized as about 37 tons during monitoring period. NO _x emission reduction corresponding to realized generation is calculated as 71 tons.
Future Target for Parameters		SO ₂ and NO _x emission reductions corresponding to annual generation.
Way of Monitoring	How	Electricity generated by Gunaydin WPP, NO _x and SO ₂ emission data from GHG inventory of Turkey and TEIAS Statistics for yearly national electricity generation data will be used as reference in calculation of the emission reductions.
	When	Yearly
	By Who	Project Owner

Indicator		Quality of Employment
Mitigation measure		All recruited technical staff is trained for operation and maintenance of equipment and Health and safety measures. Also, staff working with high voltage equipment during operation phase will be certified (also required by regulations). The trainings will be renewed for new staff if necessary.
Chosen Parameters		Number of personnel certified/trained during operation phase

¹⁰ http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/tur-2014-crf-15apr.zip 2012 tables, table 1s1

¹¹ [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim\(23-47\)/37\(06-12\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls)

Current Situation of the Parameters		Existing and new staff are being continuously trained in relevant disciplines. (Working at heights, high voltage equipment, HSE, fire extinguishing etc) Certified trainings given in this monitoring period: <table><tr><th>Attendee</th><th>Provided By</th><th>Subject</th><th>Issuance Date/Training Duration</th></tr><tr><td>İsmail AYGÖRMÜŞ</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4days)</td></tr><tr><td>Mesut AÇIK</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4days)</td></tr><tr><td>Salih BIRCAN</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4days)</td></tr><tr><td>Ümit TANRIVERDİ</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4days)</td></tr><tr><td>Ahmet GÖK</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4days)</td></tr><tr><td>Mehmet ŞENEVREN</td><td>CETINEL ENGINEERING</td><td>Professional Competency (Defensive Driving)</td><td>28/02/2014 (4 days)</td></tr></table> 6 personnel were given trainings on “Professional Competency” for a duration of 4 days between 21/02/2014-25/02/2014 during this monitoring period. <table><tr><th>Attendee</th><th>Provided By</th><th>Subject</th><th>Training Date/Training Duration</th></tr><tr><td>İsmail AYGÖRMÜŞ</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Mesut AÇIK</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Salih BIRCAN</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Ümit TANRIVERDİ</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Ahmet GÖK</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Mehmet ŞENEVREN</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Mehmet Ali SARI</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Hikmet KOÇ</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr><tr><td>Rahmi DEMİR</td><td>İLK DOST</td><td>Basic HSE</td><td>25/03/2014 (9hours)</td></tr></table> 9 personnel were given trainings on “Basic HSE” for a duration of 9 hours on 25/03/2014 during this monitoring period. <table><tr><th>Attendee</th><th>Provided By</th><th>Subject</th><th>Issuance Date/Training Duration</th></tr><tr><td>İsmail AYGÖRMÜŞ</td><td>Turkish Red Crescent</td><td>Basic First Aid</td><td>23/01/2013 (2days)</td></tr><tr><td>Mehmet ŞENEVREN</td><td>Turkish Red Crescent</td><td>Basic First Aid</td><td>23/01/2013 (2days)</td></tr></table> 2 personnel were given trainings on “Basic First Aid” for a duration of 2 days between the dates 22/01/2013-23/01/2013.	Attendee	Provided By	Subject	Issuance Date/Training Duration	İsmail AYGÖRMÜŞ	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4days)	Mesut AÇIK	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4days)	Salih BIRCAN	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4days)	Ümit TANRIVERDİ	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4days)	Ahmet GÖK	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4days)	Mehmet ŞENEVREN	CETINEL ENGINEERING	Professional Competency (Defensive Driving)	28/02/2014 (4 days)	Attendee	Provided By	Subject	Training Date/Training Duration	İsmail AYGÖRMÜŞ	İLK DOST	Basic HSE	25/03/2014 (9hours)	Mesut AÇIK	İLK DOST	Basic HSE	25/03/2014 (9hours)	Salih BIRCAN	İLK DOST	Basic HSE	25/03/2014 (9hours)	Ümit TANRIVERDİ	İLK DOST	Basic HSE	25/03/2014 (9hours)	Ahmet GÖK	İLK DOST	Basic HSE	25/03/2014 (9hours)	Mehmet ŞENEVREN	İLK DOST	Basic HSE	25/03/2014 (9hours)	Mehmet Ali SARI	İLK DOST	Basic HSE	25/03/2014 (9hours)	Hikmet KOÇ	İLK DOST	Basic HSE	25/03/2014 (9hours)	Rahmi DEMİR	İLK DOST	Basic HSE	25/03/2014 (9hours)	Attendee	Provided By	Subject	Issuance Date/Training Duration	İsmail AYGÖRMÜŞ	Turkish Red Crescent	Basic First Aid	23/01/2013 (2days)	Mehmet ŞENEVREN	Turkish Red Crescent	Basic First Aid	23/01/2013 (2days)
Attendee	Provided By	Subject	Issuance Date/Training Duration																																																																															
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Future Target for Parameters		Staff will be given necessary trainings Possible Training subjects are listed below: • ISO 9000:2008 Quality Management System • ISO 14001 Environment Management System and OHSAS 18001 Health and Safety Management System • Analysing and Assessment of Risk • Fire extinguishing The project owner holds the right to schedule or re-structure the trainings programme.																																																																																
Way of	How	Through review employment records and training documents/certificates																																																																																

	When	Yearly
	By Who	Project owner

Indicator		Balance of payments and investment
Mitigation measure		Not required
Chosen Parameters		Currency saving due to avoided fuel import
Current Situation of the Parameters		In 2012, about 23.09 bn m ³ natural gas been used ¹² for about 104,499.2 GWh electricity generation ¹³ and about € 5.1 bn has been spent. ¹⁴ During monitoring period, about 11.688 million m ³ NG has been saved which corresponds to 2.58 million €.
Future Target for Parameters		Approximately, consumption of 8.109 million m ³ of natural gas is expected to be avoided corresponding to € 1.79 million annually.
Way of Monitoring	How	Through comparing electricity generated by Gunaydin WPP and natural gas that would be used to produce the same amount of electricity according to baseline scenario.
	When	Yearly
	By Who	Project owner

Indicator		Water quality and quantity
Mitigation measure		Mitigation measure is not required
Chosen Parameters		Disposal of the waste water
Current Situation of the Parameters		Waste water is kept and stored under confined conditions and disposed in line with the regulations. Accumulated waste water is removed by an authorized company on 27/03/2014
Future Target for Parameters		Disposal of waste water as required by the relevant regulations
Way of Monitoring	How	Assessing disposal methods during site visits and checking waste disposal records.
	When	Annually
	By Who	Project Owner

Indicator		Biodiversity
Mitigation measure		Taking necessary actions determined by the experts.
Chosen Parameters		Number of bird species and affected species

¹² <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/yak%C4%B1t48-53/49.xls>

¹³ [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim\(23-47\)/37\(06-12\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls)

¹⁴ BOTAS natural gas price and TCMB exchange rate for 12/2011 have been used in the calculations.

Current Situation of the Parameters		Latest ornithology report dated August-October 2012 prepared by Bird Researcher Süleyman Eksioglu, also a member of Nature Research Society has yielded that the project is not a threat to the migrating birds. Main reasons behind the comment were that the number of turbines is not many, the terrain is considerably plain and there are alternative routes for the migrating birds. Also another report was prepared by ornithologist S. Levent Turan, who is also an instructor in Hacettepe University. The report extended the studies up to 2013 spring season and concluded that; depending on the experience and empirical monitoring studies for several projects in the region since 2009 as well as the Gunaydin WPP project in 2013, no significant threats to the migrating bird species have been identified and it has been observed that the project site is not on a preferred migration route for the birds. ¹⁵
Future Target for Parameters		The project activity will remain neutral for the regional biodiversity
Way of Monitoring	How	Ornithology report
	When	Once
	By Who	Project Owner and Ornithologist

Indicator		Soil Condition
Mitigation measure		No mitigation measure is required
Chosen Parameters		Amount of non-hazardous solid wastes during construction and operational phases. Appropriate management of all waste in line with regulations
Current Situation of the Parameters		Wastes are being handled as per the regulations. Regular disposals or recycling practices are applied.
Future Target for Parameters		Recyclable and non-recyclable wastes will be stored temporarily and will be disposed by the Manyas Municipality. Excavated soil will be used for landscaping
Way of Monitoring	How	Site visit and checking waste disposal records.
	When	Annually
	By Who	Project Owner and expert

Indicator		Access to affordable and clean energy services
Mitigation measure		No mitigation action is required for this indicator.
Chosen Parameters		Fossil fuel replaced
Current Situation of the Parameters		In 2012, about 23.09 bn m ³ natural gas been used ¹⁶ for about 104,499.2 GWh electricity generation ¹⁷ and about € 5.1 bn has been spent. ¹⁸
Future Target for Parameters		Approximately, consumption of 8.109 million m ³ of natural gas is expected to be avoided annually.
Way of Monitoring	How	Through comparing electricity generated by proposed project and natural gas that would be used to produce the same amount of electricity by a thermal power plant

¹⁵ Ornithologic Ecosystem Assessment Report, by Prof. S. Levent Turan, Hacettepe University dated 2013. , p 13

¹⁶ <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/yak%C4%B1t48-53/49.xls>

¹⁷ [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim\(23-47\)/37\(06-12\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls)

¹⁸ BOTAS natural gas price and TCMB exchange rate for 12/2011 have been used in the calculations.

	When	Yearly
	By Who	Project Owner

Indicator	Quantitative employment and income generation	
Mitigation measure	Mitigation measure is not required	
Chosen Parameters	Payments made to staff	
Current Situation of the Parameters	Currently 9 personnel are employed by MANRES.	
	No	Name of Personnel
	1	İsmail Aygörmüş
	2	Mehmet Ali Sarı
	3	Salih Bircan
	4	Mehmet Şenevren
	5	Ümit Tanrıverdi
	6	Hikmet Koç
	7	Ahmet Gök
	8	Rahmi Demir
	9	Mesut Açık
Future Target for Parameters	Project will create new job opportunities compared to baseline scenario	
Way of Monitoring	How	Through evaluation documents for wages paid and social security documents.
	When	Yearly
	By Who	Project owner

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
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