

MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

- A. General description of the project activity
 - A.1. Brief description of the project activity
 - A.2. Project participants
 - A.3. Location of the project activity
 - A.4. Technical description of the project
 - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
 - A.6. Registration date of the project activity
 - A.7. Crediting period of the project activity and related information
 - A.8. Name of responsible person(s)/entity(ies)
- B. Implementation of the project activity
 - B.1. Implementation status of the project activity
 - B.2. Revision of the monitoring plan
 - B.3. Request for deviation applied to this monitoring period
 - B.4. Notification or request of approval of changes
- C. Description of the monitoring system
- D. Data and parameters monitored
 - D.1. Data and parameters used to calculate baseline emissions
 - D.2. Data and parameters used to calculate project emissions
 - D.3. Data and parameters used to calculate leakage emissions
 - D.4. Other relevant data and parameters
- E. Emission reductions calculation
 - E.1. Baseline emissions calculation
 - E.2. Project emissions calculation
 - E.3. Leakage calculation
 - E.4. Emission reductions calculation
 - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
 - E.6. Remarks on difference from estimated value

MONITORING REPORT
Version 04 - 19/03/2013
Soma Wind Power Plant
GS Reference GS655
Monitoring Period 2 from 01/07/2012 through 31/12/2012

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

Soma Wind Power Plant (the “Project”) has 90 MW of total installed capacity and is located in Soma and Kırkağaç towns, Manisa province, Turkey (the “Host Country”). Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. is the project owner and the developer (the “Project Developer”).

The Project consists of 36 Nordex N90/2500 kW wind turbines, each of 2.5 MW installed power. The purpose of the Project is to export the generated electricity to the regional grid, thereby contributing to Turkey’s electricity demand and economy. The Project is expected to generate approximately 307,500 MWh of electricity annually, and to reduce ca. 182,605 tonnes of CO₂ emissions per year.

The Project generates electricity by utilising wind power to supply the increasing national electricity demand in a cleaner and more sustainable manner. Since the Project generates electricity from renewable energy resources, it makes a significant contribution to climate protection. The Project also stimulates Turkey’s economic development, since wind power, being an infinite and natural resource, is more ecologically and financially sustainable than other options. In the absence of the Project, an equivalent amount of electricity would have been generated from grid-connected power plants, the majority of which are fossil fuel based.

Project construction commenced August 2009, with 32.5 MW (i.e. 13 x 2.5 MW) operational as of 13/08/2010. On 23/09/2010 another 27.5 MW (i.e. 11 x 2.5 MW) began operating. On 11/11/2010 the project became fully commissioned when the last 30 MW (i.e. 12 x 2.5 MW) began operating.

This second monitoring period covers 6 months from 01/07/2012 to 31/12/2012 (both days included). Total emission reductions achieved in this period are 104,569 tCO₂e.

A.2. Project Participants

Host party: Turkey, indirectly involved; Authorised Participants: Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. (Private Entity).

Other parties involved:

- United Kingdom of Great Britain and Northern Ireland, involved indirectly; Authorised Participants: J. P. Morgan Ventures Energy Corporation (Private Entity);

Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. is the project owner and developer.

A.3. Location of the project activity:

The project is located in Soma and Kırkağaç towns, Manisa province, Turkey with Universal Transverse Mercator (“UTM”) co-ordinates:

4328536.21 N & 558000.35 E



Figure 1: Manisa Province, Turkey (Google Map)



Figure 2: Soma and Kırkağaç Towns (Google Map)

The site selection is based on detailed wind measurements, smoothness of the surface, availability of the topographical conditions for access and construction, the available area size and the distance to the national grid connection point.

The turbines are located on the top of Davullu Hill, Karadede Hill, Ören Hill, Şifa Hill and cover an area of 150 hectares. Nearby villages are Gökçukur and Hamidiye in Kırkağaç; Kızılören, Kozluören, Hecizköy, Beyçe and Göktaş in Soma.

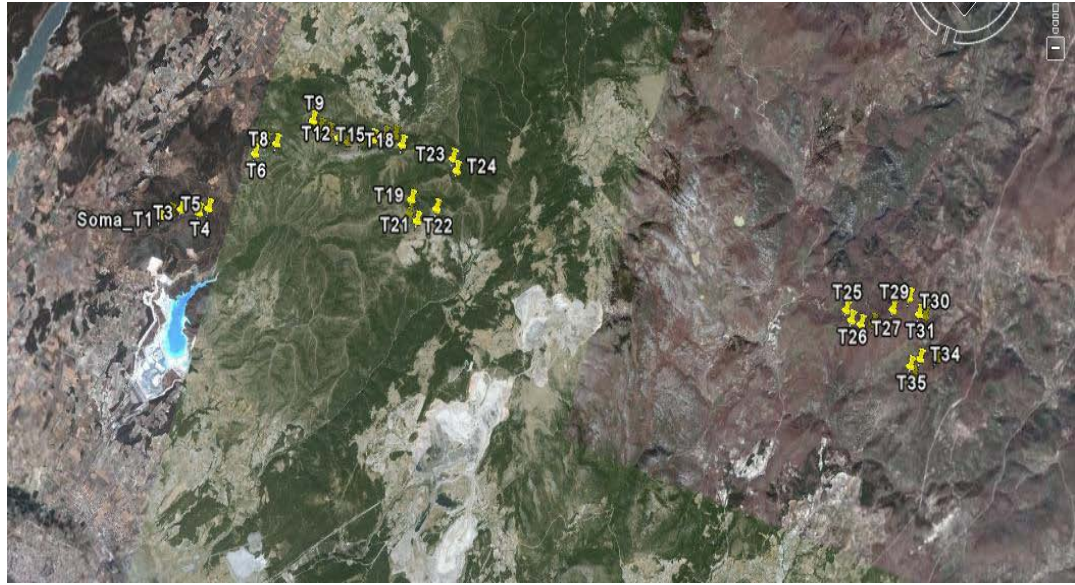


Figure 3: Wind turbine locations (Google Earth)

Turbine #	N	E
1	4346541	552942
2	4346748	553159
3	4346919	553424
4	4346947	553847
5	4347147	554071
6	4348731	554911
7	4349237	555300
8	4349350	555587
9	4350059	556381
10	4350074	556651
11	4349985	556917
12	4349985	557197
13	4350065	557600
14	4350220	557824
15	4350330	558187
16	4350504	558420
17	4350629	558697
18	4350496	558966
19	4349375	559680
20	4349066	559752
21	4348968	560018
22	4349456	560433
23	4350658	560533
24	4350449	560709
25	4350856	572846
26	4351034	573075
27	4351219	573490
28	4351485	573709
29	4351747	573966

30	4352204	574250
31	4351937	574578
32	4351164	575504
33	4351045	575262
34	4350906	575031
35	4350712	574843
36	4350503	575017

Table 1: UTM coordinates of the project wind turbines¹

A.4. Technical description of the project

Soma Wind Power Plant consists of 36 wind turbines each of 2.5 MW capacity. The Project has 90 MW of installed capacity, and the expected annual generation is 307,500 MWh. The Project's Generation License was issued on 17/07/2008 and recently revised on 28/01/2010 by the Energy Market Regulation Authority (subsequently "EMRA")².

Based on the micrositing studies, each turbine is placed to achieve maximum wind yield. As per the Nordex catalogue³, Nordex N90 2.5 MW turbines provide energy even at low wind speeds. Overall wind turbine efficiency is dependent on each turbine's placement, which is a function of research conducted prior to project implementation. According to the micrositing report by Garrad Hassan and Partners Ltd. the overall efficiency of the wind farm is estimated to be about 39% based on total net energy output estimates. Major equipment and structures at the Project site include:

- 36 Turbines, each of 2.5 MW capacity
- 36 step-up transformers (3 MVA)
- 1 transformer (35 MVA)
- 1 transformer (100 MVA)
- Switchgear Station
 - o 2 Transformers
 - o 2 Control Rooms
 - o 2 Switchgear Equipments
- Office/Management Facilities
- 2 Control and Protection Equipments
- Channels for cables

Component Name	Quantity
Anchor Parts	36
Tower Section 1	36
Tower Section 2	36
Tower Section 3	36
Tower Section 4	36
Tower Equipment	36
Tower Bolt	36
Blade 1	36
Blade 2	36
Blade 3	36
Nacelle (incl. accessories)	36

¹ Per project generation license

² Turkish name: "Enerji Piyasası Düzenleme Kurumu" (or "EPDK").

³ Nordex N90/2500 New dimensions in the 3rd generation.(Manufacturer's product brochure, available at http://www.nordex-online.com/fileadmin/MEDIA/Produktinfos/EN/N90_2500_Broschuere_GB_web.pdf)

Drive Train	36
Cooling Hood	36
Hub	36
Converter Cabinet	36
Accessory & Consumable Container	36
Scada Equipment	1
Electricity Main Meter ⁴	2
Electricity Back-up Meter	2

Table 2: Installed Equipment

Nordex N90/2500 kW High Speed 3-blade wind turbines are used in the Project. The nacelle of the turbine turns to the wind and the turbine blades have the ability to change angles according to wind direction via pitch control system. The towers are 80 m high (to the hub), and the blade diameter is 90 m. There are two 154 kV substations in the system one at Kırkağaç, one at Soma. The electricity produced by each wind turbine is transmitted to the each 154 kV substation via underground cabling and 3 MVA step-up transformers. (There are 12 Turbines connected to substation at Kırkağaç, 24 turbines connected to substation at Soma). The total 30 MW energy from Kırkağaç Substation is transmitted to Soma Substation via 154 kV overhead line and together with the turbines connected to Soma substation, in the Soma substation the 90 MW is transmitted to the national grid system via 154 kV TEİAŞ Soma B Substation and 60 utility poles (running for 18 km).

Figure 4 illustrates the schematic representation of the Project and its boundaries.

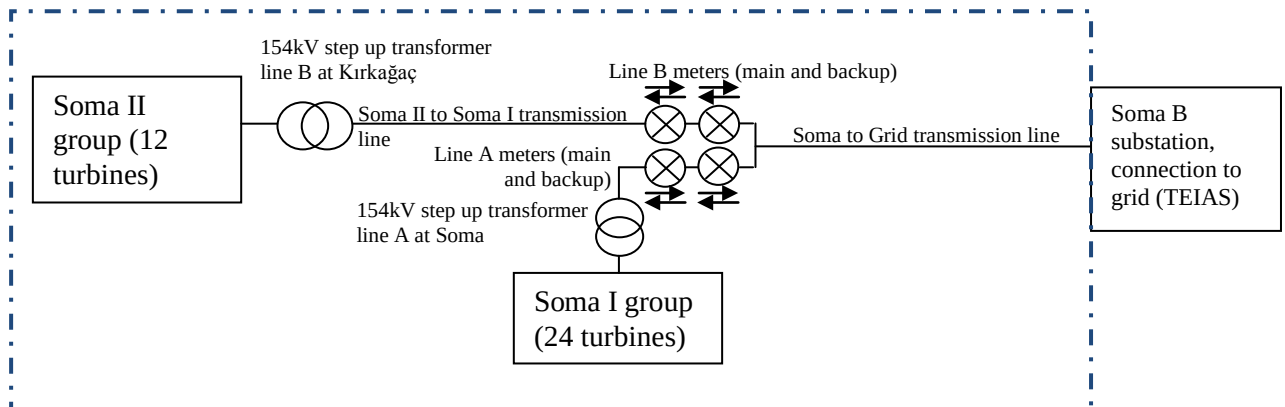


Figure 4: The Project and its boundaries.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

Methodology ACM0002 version 12.1.0 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” approved by the CDM Executive Board is applied, and is hereafter referred to as the “Baseline Methodology”. The Baseline Methodology is employed in conjunction with the approved monitoring methodology Version 12.1.0 of ACM0002 (hereafter referred to as the “Monitoring Methodology”).

The monitoring report also employs:

- Version 5.2 of the “Tool for the demonstration and assessment of additionality” (from EB39);
- Version 2 of the “Tool to calculate the emission factor for an electricity system” (from EB50).

⁴ The electricity meters (both main and back-up) belong to TEİAŞ, and are sealed and locked as they are installed in the main control room.

A.6. Registration date of the project activity:

The Project is registered under the Gold Standard Registry with project number GS 655 on 06/09/2012 but with a registration date of 23/01/2012 which is the date of the end of the first 8 week review.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

Construction of the project and thus the starting date of the project activity is 20/08/2009. First commissioning date is 13/08/2010.

The start of the crediting period is 13/08/2010.

Crediting period: 3 x 7 years 0 months (i.e. renewable twice).

A.8. Name of responsible person(s)/entity(ies):

Contact person: N. Burcu Tülek

Address: Kuleli Sk. No: 87/8 06700 G.O.P.
Ankara, Turkey

Tel.: +90 312 446 30 23

Fax.: +90 312 437 43 99

E-mail: bkilic@bilgin.com.tr

SECTION B. Implementation of the project activity**B.1. Implementation status of the project activity**

Soma Wind Power Plant started to generate electricity for the Turkish National Grid on 13/08/2010 as its first 13 units of 2.5 MW each turbines (called "T1" to "T13") had commenced operation. On 23/09/2010, 11 more 2.5 MW each turbines (called "T14" to "T24") became operational. On 11/11/2010 the last 12 units of 2.5 MW each turbines became operational and the Project therefore reached 90 MW of total installed capacity.

During this monitoring period:

- The plant became fully operational by 11/11/2010.
- There were no events or situations that occurred during the monitoring period which may impact the methodology's applicability, therefore there were no major issues resulting from any event that need to be addressed.
- During the monitoring period, the Project has generated 176,089.56 MWh of electricity to the grid. This is in line with the registered PDD estimates.

B.2. Revision of the monitoring plan

There has been no revision of the monitoring plan to date.

B.3. Request for deviation applied to this monitoring period

No request for deviation was applied during this monitoring period.

B.4. Notification or request of approval of changes

No notification or request of approval of changes has been made.

SECTION C. Description of the monitoring system

Technical Parameters

The monitoring methodology applied to the Project is Version 12.1.0 of ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” (from EB56). The baseline methodology is used in conjunction with the approved monitoring methodology Version 12.1.0 of ACM0002 (the “Monitoring Methodology”).

The Monitoring Plan (subsequently “MP”) includes monitoring of electricity generation by the project activity in addition to key sustainable development indicators. The MP (in conjunction with the PDD) is implemented by the Project Developer during all stages of the project activity. The Plant Manager is responsible for monitoring the plant’s electricity generation.

The electricity generated is metered by TEİAŞ by two meters placed on the switchgear station as shown on figure 4 above, where the plant is connected to national grid. Those meters provide official data which is read and recorded monthly by TEİAŞ officers for invoicing (as of January 2012, this data recording is done automatically and processed by PMUM/MFRC (Market Finance Reconciliation Centre). The maintenance and calibration are also done by TEİAŞ; which ensures the accuracy and quality of the measurements.

Electricity generation may be cross-checked against the SCADA system employed in the turbines – this shows actual generation per turbine. However, in practice the cross checking is done by the plant staff with the backup meters that are located in immediate proximity of the main meters. The MFRC/PMUM⁵ data, which is used for invoicing purposes, can be accessed via a specific user id and password by the Project Developer. This data is provided to the Verifier in the form of screenshots to facilitate cross-checks and to compare against monthly electricity generation indicated in the signed meter protocols.

Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. is responsible for operating the wind power plant and monitoring the project activity in accordance with the Monitoring Manual prepared and updated for the use of Bilgin Rüzgar Santrali Enerji Üretimi A.Ş.

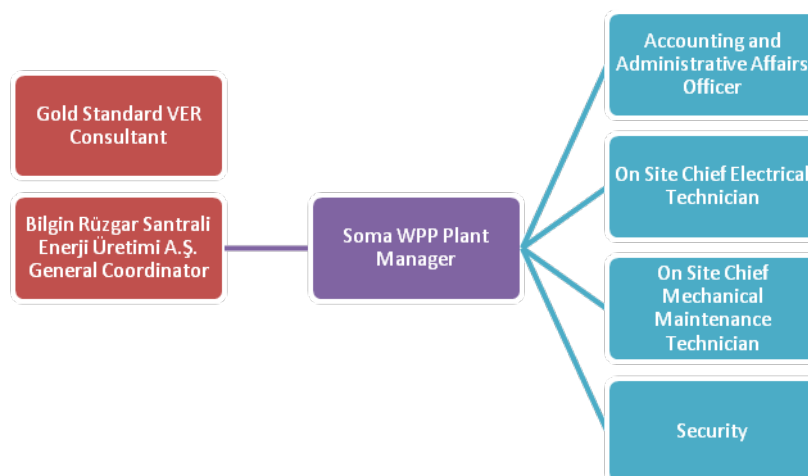


Figure 5: Organisational Structure for Soma Wind Farm

⁵ Market Financial Reconciliation Centre

The Plant Manager is responsible to maintain credible, transparent, and adequate data estimation, measurement, collection, and tracking systems of the plant's net electricity generation. Those records and monitoring systems are provided to the verifying DOE during the verification process. The Plant Manager is also responsible for the plant's electricity generation, with support from plant mechanical and electrical engineers.

The roles of the staff that are involved in the implementation of the MP are listed in Table 3.

Who	Role
General Coordinator	Data entry in Excel workbook "SomaRESWorkbook_2010.xls". Solve problems (see „Temporary electricity data collection procedure" [Section 7]). Responsible for QA/QC, including archiving. Requests calibration and maintenance certificates,
Plant Manager	Electricity meter(s) reading Attends monthly meter reading with TEIAS representative
GS VER Consultant	Prepares emission report and accompanies verification(s). Quality check of the monitoring data reported in the monitoring workbook
Grid operator	Maintenance and calibration of main and control meters. Electricity meter(s) reading.

Table 3: Monitoring Roles and Responsibilities of the Staff

Training of Monitoring Personnel

Various trainings were organised for the development of monitoring personnel. Examples include theoretical and practical safety training, service works at wind turbine gearbox, fire training etc. All technical staff of the power plant are trained for work in high voltage environments, as required by TEIAS. VER team personnel are trained regarding the Project's emission reductions.

Data Quality Assurance and Control (QA/QC)

QA/QC of meters and back up meters: In accordance with the Article 9 (b) of the "Inspection of Measurement and Measuring Instruments Regulation" which was published in Turkish Official Gazette dated 24/7/1994 and No.22000, the inspection of meters needs to be done in every 10 years.

For internal records, the project operator keeps the originally signed copy of the meter protocols at the head office. Furthermore, electronic copies are kept (as well as backed up) in order to restore the data in case it is corrupted or destroyed. For this purpose, hard and soft copies of meter protocols and PMUM data are also kept by the plant manager.

Sustainable Development Parameters

In addition to the technical parameters described above, Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. has been monitoring the following parameters per the Sustainability Monitoring Plan of the registered Project's Gold Standard:

No	1
Indicator	Air Quality
Mitigation measure	Suppression of dust during construction
Chosen parameter	dust during construction
Current situation of parameter	During the current monitoring period no construction activities

		were undertaken.
Way of monitoring	How	Visual inspection and communication with local residents
	When	During construction
	By who	Project Owner

In the context of the Environmental Plan submitted with the project documents to the Ministry of Environment and Forestry, the following measures were required to be adopted to minimise impacts during construction and operation. Necessary precautions, such as watering of roads, careful loading/unloading and covering the top of loaded trucks with tarpaulins had been employed to minimise dust dispersion and erosion during excavation.

No	2	
Indicator	Soil Condition	
Mitigation measure	Planting of trees to remediate soil movements as a result of the construction of the project	
Chosen parameter	Trees planted	
Current situation of parameter	Compulsory fee for reforestation activities has been paid in full to the Regional Directorate of Forestry / Turkish Ministry of Environment and Forestry in 2010. The money collected will be used to reforest the area once the project is decommissioned. Regarding voluntary action during the lifetime of the Project, 110 pine trees were planted in June 2012 to remediate soil movements as a result of the construction of the Project. Photographs and receipts/invoices are provided to the verification team.	
Future target for parameter	The planting schedule to remediate soil movement in the Project area is to plant 100 trees over the years 2012 and 2013 at a rate of 100 trees each year. 110 trees were planted in June 2012. 100 trees are planned to be planted in 2013.	
Way of monitoring	How	Count number of trees planted and photograph any required remediation
	When	During operation
	By who	Project developer

No	3	
Indicator	Quality of Employment	
Mitigation measure	Complying with laws and regulations of Ministry of Labour on occupational health and safety. Improving occupational skills of the employees by having various trainings	
Repeat for each parameter	-	
Chosen parameter	The Project complies with the current laws and regulations; and organizes various trainings to the employees.	
Current situation of parameter	The Project complies with Occupational Health and Safety Law No.6331, Labour Law No.4857, and Ministry of Labour and Social Security Law No: 25426. As per the Article 17 of the most recent occupational health and safety law no.6331 dated 20/06/2012, the H&S trainings shall be renewed in accordance with the new and changing risks, shall be repeated at regular intervals when it seen necessary. Accordingly, the H&S training in November 2011, and the risk assessment reports prepared in November 2011 and August 2012 have not been renewed since there is no new risks occurred in the	

		project site. The Project management implements a health safety programme as part of the corporate culture. The Project has improved the health and safety system and re-established the monitoring system evaluating employee performance against occupational health and safety targets. Employees have the opportunity to improve their occupational skills via various trainings such as Nordex's service and customer trainings, SEG converter maintenance training, Poliya composite wind turbine repair training, theoretical and practical safety training, service works at wind turbine gearbox, occupational health and safety, fire training etc.
Way of monitoring	How	Report by a health and safety specialist on the key aspects of the law and how it complies.
	When	Annually
	By who	Project Owner

No		4
Indicator		Water quality and quantity
Mitigation measure		Supplying utilisation and drinking water by tankers and big bottles; and complying the current laws and regulations for the disposal of waste water.
Chosen parameter		The project provides water by tankers and big bottles; and disposes the waste water in accordance with current laws and regulations.
Current situation of parameter		The water for domestic uses is supplied by tankers. Drinking water is supplied with big bottles. The Project complies with Turkey’s Environmental regulations. Water for domestic use is supplied by tankers, and wastewater is collected in septic tanks and disposed of regularly in accordance with Water Pollution Control Regulations. Furthermore, the Project Owner observes necessary precautions solid waste disposal, waste water disposal, and waste oils arising from the project. Solid waste undergoes collection, where recyclables are separated and dispatched to recycling centres. Waste oil is collected and transferred to the recycling centre in accordance with Hazardous Waste Control and Waste Oil Control Regulations. All remaining waste is disposed of at the nearest landfill site in coordination with Soma and Kırkağaç Municipalities.
Way of monitoring	How	Inspection of receipts on utilisation and drinking water; and forms and receipts showing the waste water disposed.
	When	Annually
	By who	Project Owner

No	5
Indicator	Other pollutants
Mitigation measure	Reporting by an independent third party on noise levels from the project; and archiving the receipts and forms of waste disposal.
Chosen parameter	Report on noise measurement and records for the waste disposal

Current situation of parameter		A report has been undertaken by a reputable/accredited 3rd party regarding noise levels of the Project. The report verifies that the Project complies with the relevant regulation in Turkey with regards to noise levels, which is covered by two articles: 1) The first one is the Article 22 of the Legislation of Occupational Health and Safety dated 11.01.1974 and published on Official Gazette no.14765, where it is stated that maximum noise limit is 80 dBA on industrial sites. Consequently, the report provides in p.10-11 the noise levels measured at the 16 measurement points on the site near the turbines where the noise levels is supposed to be the highest. 2) The second one is the Article 22 of the Regulation of Environmental Noise Assessment and Management dated 4 June 2010 and published on Official Gazette No.27601, the noise limits for commercial buildings located near residential areas are defined as: 65 dBA during the day, 60 dBA during the evening and 55 dBA during the night time. This is presented in the report on p.11 with noise measurements taken from Gökçukur Village, which is the nearest residential area to the Project site and is located more than a kilometer away from the nearest turbine from the Soma Project. Furthermore, the Project owner observes necessary precautions solid waste disposal, waste water disposal, and waste oils arising from the project. Solid waste undergoes collection, where recyclables are separated and dispatched to recycling centres. Waste oil is collected and transferred to the recycling centre in accordance with Hazardous Waste Control and Waste Oil Control Regulations. All remaining waste is disposed of at the nearest landfill site in coordination with Soma and Kırkağaç municipalities.
Way of monitoring	How	Third party noise measurement and reporting; and also inspection of receipts and forms for the disposal of wastes.
	When	Noise report is prepared once off when all turbines operational. Receipts and forms for the waste disposal will be inspected annually.
	By who	Project Owner

No		6
Indicator		Quantitative Employment
Mitigation measure		Providing employment opportunities to the people who lives around the project site
Chosen parameter		Employment of local people
Current situation of parameter		The Project provides employment opportunities for local people with wages above the local average. This is quantitatively demonstrated by comparing wages at the Project site (during the monitoring period) with the latest available data from the Turkish Statistical Institute for the Aegean region. Currently the Project employs 11 people from the nearby villages.
Way of monitoring	How	Developer to keep employee records
	When	Annually
	By who	Project Owner

No		7
Indicator		Biodiversity
Mitigation measure		Complying with the terms of EIA-exemption letter from Ministry of Environment and Forest; and organizing a detailed investigation/ study on bird movements
Chosen parameter		Report by an independent third party on bird movements
Current situation of parameter		The following precautions are taken in order to ensure the project does not have any negative impact on biodiversity: 1) The tips of the blades are painted a bright red colour to improve their visibility, in contrast to the base colour of the blade, which is white. Furthermore, pinned barriers are built on top of the transmission line poles and bright aviation balls are placed on wires in order to make the transmission line more visible. 2) Regular patrols of the site are made by the company's security guards on each shift. The guards are instructed to look out for any dead birds and bats that may have been struck by the turbines and transmission line poles and wires. As of November 2011, if such birds or bats are found, these are photographed and recorded in a book that is kept at the site office. If no birds or bats are found on a shift, that is also recorded. 3) A detailed study by an independent third party has been undertaken in September 2012. The conclusion of the study is that there are no bird migration routes passing over the Soma-WPP operation area.
Way of monitoring	How	Report on bird movements prepared by an independent third party; and keep security logbook on each shift to monitor if any birds/ bats are found or not.
	When	During operation
	By who	Project Owner

No		8
Indicator		Public Health and Safety
Mitigation measure		Taking precautions to protect public from any potential high voltage hazard.
Chosen parameter		Precautions to ensure the public health and safety
Current situation of parameter		The Project owner has fenced each of the 36 turbines to ensure public safety in that no third party is injured due to the high voltage of the turbines. The switch gear area and the main control chamber and substation are also fenced and guarded. The project also employs 11 security guards to patrol the area.
Way of monitoring	How	Photograph the precautions taken
	When	Annually
	By who	Project Owner

Further Action Requests (FARs) from Previous Verification

FAR#1 (raised by the DOE): "The update monitoring manual will be verified during next verification."

The updated monitoring manual is provided to the DOE to show that the meters are reported hourly in manual logbook on the Project Site.

FAR#2 (raised by the DOE): “The PP shall share information and evidences on the tree planting progress at next verification and verification DOE shall also provide feedback based on the site visit observation.”

The planting schedule to remediate soil movement in the Project area is to plant 100 trees over the years 2012 and 2013 at a rate of 100 trees each year. 110 trees were planted in June 2012. 100 trees are planned to be planted in 2013. Relative invoices, receipts and photographs are available.

FAR#3 (raised by the GS): “Verification DOE shall verify diesel consumption that are also supported with review of diesel consumption invoices at next verification.”

The logbook in which the diesel consumption is recorded at the project site is provided to the DOE with the fuel invoices.

FAR#4 (raised by the GS): “Verification DOE shall “independently” interview people by communicating in local language as to ensure transparent and free communication. Other interviewees shall be selected from the locals who are living in the vicinity of the project in terms of discussing respective issues at next verification in addition to potential interviewees including muhtar and project employees.”

Verification DOE will be coming to the site visit with an independent translator to communicate with local people.

Calculation of Emission Reductions

An Excel spreadsheet is used to calculate Project emission reductions. The Project Developer collects data for electricity generation (EG_y) and net Project electricity supplied to the grid ($EG_{\text{facility}, y}$). Generation is measured and recorded monthly through two high precision measuring devices sealed and controlled by TEİAŞ (according to their stringent regulations). Data may also be cross-checked against data from backup meters, located in immediate proximity of the main meters.

The quantity of net electricity generated by the plant is monitored in order to demonstrate the emission reduction. Monthly generation data is measured and recorded by both TEİAŞ and the Project Developer (as of January 2012, this data recording is done automatically and processed by PMUM/MFRC (Market Finance Reconciliation Centre). However, a company representative still goes to TEİAŞ at the end of each month to take the original copy of the meter protocol, which is still signed and approved by the authorized person from TEİAŞ and the project owner’s representative.). Data is recorded in an Excel workbook and retained in electronic and paper form, at the project site and at the Project Developer’s Head Office in Ankara.

The annual Project emission reductions are calculated by multiplying net electricity generated and combined margin emission factor. Project verification/issuance are undertaken by Bilgin Rüzgar Santrali Enerji Üretimi A.Ş., and JP Morgan Ventures Energy Corporation in conjunction with the assigned DOE and the Gold Standard.

The Plant Manager is responsible for maintenance of credible, transparent, and adequate data estimation, measurement, collection, and tracking systems of the net electricity generation of the plant. The relevant data is provided to the selected DOE to verify project performance as part of the verification process.

The Plant Manager is responsible for plant electricity generation, and is assisted by mechanical and electrical engineers as per Figure 6 (below). All relevant data is recorded by the Plant Manager on a monthly basis. Data (in electronic and paper form) is retained by the Project Developer at the project site and at the Head Office in Ankara for two years following the completion of the crediting period.

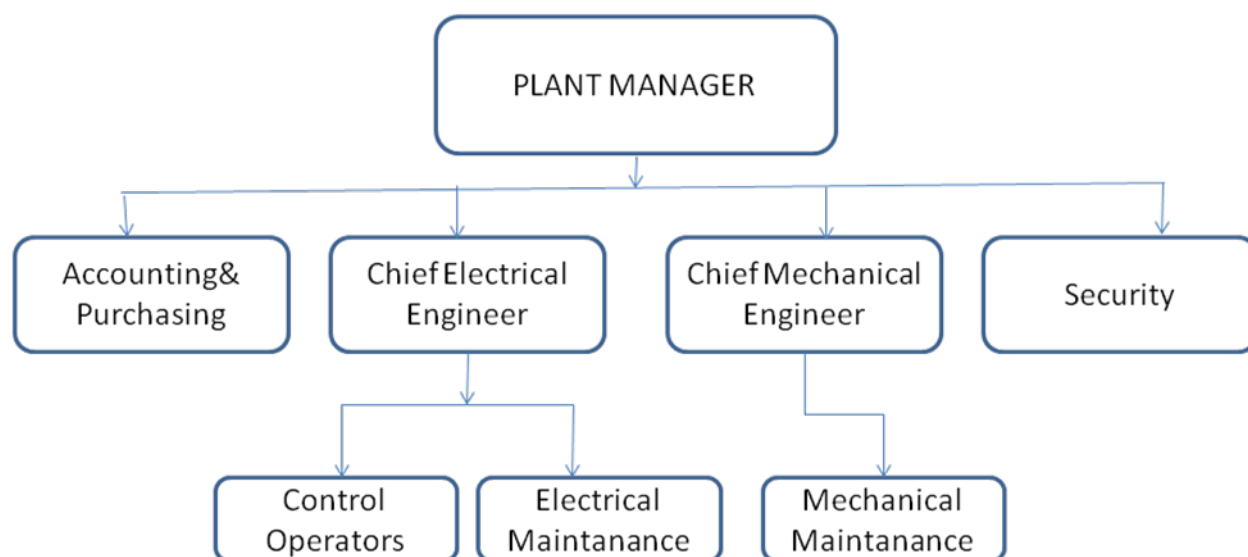


Figure 6: Project organisational structure.

SECTION D. Data and parameters

Parameters used to calculate baseline, project, and leakage emissions, as well as other relevant parameters required by the approved methodology and the monitoring plan:

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	$FC_{i,y}$
Data unit:	Mass or Volume Unit (Tonnes or cubic meter)
Description:	Amount of fuel i consumed by relevant power plants in Turkey in years, 2006, 2007, 2008
Source of data used:	Turkish Electrical Distribution Company Web Site (http://www.teias.gov.tr/istatistik2008/44.xls)
Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data used is taken from the TEIAS website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEIAS website is the most up-to date and reliable data available for the Turkish grid.
Any comment:	Data used for the calculation of $EF_{grid,OM,Simple,y}$

Data / Parameter:	NCV
Data unit:	GJ/Mass or Volume Unit
Description:	Net Calorific Values for fossil fuels in years 2006, 2007 and 2008
Source of data used:	Turkish Electrical Distribution Company Web Site (http://www.teias.gov.tr/istatistik2008/46.xls http://www.teias.gov.tr/istatistik2008/44.xls)

Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data used is taken from the TEIAS website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEIAS website is the most up-to date and reliable data available for the Turkish grid.
Any comment:	Data used for the calculation of $EF_{grid,OM,Simple,y}$. As data on the NCV is not published directly on the TEIAS website, this data is calculated using the heating values of fuels and the volume or mass of fuels consumed for each year.

Data / Parameter:	$EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$
Data unit:	tCO ₂ /GJ
Description:	CO ₂ emission factor of fossil fuel type <i>i</i> in year <i>y</i>
Source of data used:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the "Tool to calculate the emission factor for an electricity system" version 02, if values provided by the fuel supplier of the power plants in invoices or regional or national average defaults values are not available the IPCC default values at the lower limit of uncertainty must be used.
Any comment:	Data used both for the calculation of $EF_{grid,OM,Simple,y}$ and $EF_{EL,m,y}$

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year <i>y</i>
Source of data used:	Turkish Electrical Distribution Company Web Site http://www.teias.gov.tr/istatistik2008/37(06-08).xls www.teias.gov.tr/istatistik2008/30(84-08).xls
Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data used is taken from the TEIAS website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEIAS website is the most up-to-date and reliable data available for the Turkish grid.
Any comment:	Data used for the calculation of $EF_{grid,OM,Simple,y}$

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	<i>Net quantity of electricity generated and delivered to the grid by power unit <i>m</i> in year <i>y</i></i>
Source of data used:	Turkish Electrical Distribution Company Web Site (www.teias.gov.tr). Statistical Reports are taken for the years 2004 and 2005 and capacity projection reports are used for the years 2006, 2007 and 2008.
Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data used is taken from the TEIAS website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEIAS website is the most up-to-date and reliable data available for the Turkish grid.
Any comment:	Data used for the calculation of $EF_{grid,BM,y}$

Data / Parameter:	$\eta_{m,y}$
-------------------	--------------

Data unit:	-
Description:	Average net energy conversion efficiency of power unit m in year y
Source of data used:	The default values provided at the annex 1 of the "Tool to calculate emission factor for an electricity sector version 02" are used
Value applied:	Please see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the "tool to calculate emission factor for an electricity system if documented manufacturer's specifications or data from the utility, the dispatch center or official records are not available then the default values given in annex 1 of the tool shall be used. The first two options are not available for the power plants supplying the Turkish grid, therefore the default values are used.
Any comment:	Data used for the calculation of $EF_{grid,BM,y}$

D.2. Data and parameters monitored

Data / Parameter:	EG _{facility, y}			
Data unit:	MWh			
Description:	Net electricity supplied to the grid by the proposed project.			
Measured/Calculated/Default:	Measured			
Source of data:	TEİAŞ installed electricity meters.			
Value(s) of monitored parameter:	176,089.56			
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions calculations.			
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Manufacturer/model: Actaris SL7000			
	Serial numbers main meters: 53042303 & 53042305			
	Serial numbers for backup meters: 53042304 & 53042306			
	Meter	Serial Number	Calibration Dates	Validity of Calibration
	Main Meter A	53042303	19/06/2010	10 years
	Main Meter B	53042305	19/06/2010	10 years
	Backup Meter A	53042304	19/06/2010	10 years
Backup Meter B	53042306	19/06/2010	10 years	
	In accordance with Article 9 (b) of the “Inspection of Measurement and Measuring Equipments Regulation” which was published in Turkish Official Gazette dated 24/7/1994 and No. 22000, the maintenance and calibration of meters should be undertaken every 10 years.			
Measuring/ Reading/ Recording frequency:	Data is monitored continuously by metering devices, which provide the data for the monthly data input to the PMUM system of TEİAŞ. The monthly data is also summarised in Monthly Electricity Metering Statements co-signed by TEİAŞ and Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. The collected data is retained by Bilgin Rüzgar Santrali Enerji Üretimi A.Ş. until two years after the last issuance of VERs for that crediting period.			
Calculation method (if applicable):	N/A			
QA/QC procedures applied:	There are 2 electricity back-up meters. In accordance with Article 9 (b)			

of the “Inspection of Measurement and Measuring Equipments Regulation” which was published in Turkish Official Gazette dated 24/7/1994 and No. 22000, the maintenance and calibration of meters should be undertaken every 10 years.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

As per the registered PDD, the baseline emissions are calculated using the following equation (See attached spreadsheet calculations):

$$BE_y = EG_{\text{facility}, y} \times EF_{\text{grid}, CM, y}$$

BE_y	Baseline emissions in year y [tCO ₂ /yr]	104,569
$EG_{\text{facility}, y}$	Net electricity supplied by the project activity to the grid [MWh]	176,089.56
$EF_{\text{grid}, CM, y}$	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" [tCO ₂ /MWh]	0.59384

Since the Simple OM has been applied, the registered PDD value is applied throughout the crediting period (please refer to the “Tool to calculate the emission factor of an electric system” version 2).

E.2. Project emissions calculation

As per the methodology and registered PDD, project emissions are zero, so:

$$PE_y = 0$$

Although not required by the methodology or the monitoring plan, the project participant has also recorded the diesel consumption of the back-up generators at the project sites over the monitoring period 1 July 2012 to 31 December 2012. Accordingly the generator logbook and brochure are provided to the DOE.

There is one genset of 20 kW at each site of Soma-I and Soma-II. Soma-I genset was used for 5.8 hours during the monitoring period and Soma-II genset was used for 38.4 hours.

By conservatively assuming a 100% load factor during those hours when the gensets were used, total electricity potentially generated from fossil fuel combustion by the Project is 0.88 MWh over the entire monitoring period. If a 1.3 tCO₂/MWh emission factor for the diesel gensets as suggested by the CDM tool to calculate the baseline, project and leakage emissions from electricity consumption corresponds to 1.15 tCO₂ over this monitoring period. Compared to the 104,569 tCO₂ of emission reductions claimed during this monitoring period, these emissions from the diesel correspond to the below the 1 % threshold suggested by the VVS paragraph 87. The consumption of diesel generator is not considered in the emission reduction calculation since the emission is less than 1% of the total emission reductions achieved by the Project.

E.3. Leakage calculation

As per the methodology and registered PDD, there is no leakage related to the project activity, so:

$$LE_y = 0$$

E.4. Emission reductions calculation / table

Net emission reduction achieved by the project activity during monitoring period is calculated as follows:

$$ER_y = BE_y$$

Where:

ER _y	Emission reductions in year y [tCO ₂ e/yr]	104,569
BE _y	Baseline emissions in year y [tCO ₂ /yr]	104,569

The emission reductions achieved during the second monitoring period which covers 6 months period from 01/07/2012 to 31/12/2012 (both days included) is shown in the Table 4 below:

Period	Baseline Emissions [tCO ₂]	Project Emissions [tCO ₂]	Leakage Emissions [tCO ₂]	Emissions Reductions [tCO ₂]
July-12	24,305.38	0	0	24,305.38
August-12	22,933.20	0	0	22,933.20
September-12	14,830.08	0	0	14,830.08
October-12	12,134.47	0	0	12,134.47
November-12	17,870.12	0	0	17,870.12
December-12	12,495.77	0	0	12,495.77
Total	104,569.02	0	0	104,569.02
Rounded Down	104,569	-	-	104,569

Table 4: Emission reductions achieved by the Project

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

This section includes a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered GS-PDD.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the second monitoring period (01/07/2012 – 31/12/2012)
Total Emission Reductions/Year	182,605	104,569
Days	365	184
ER/day	500.29	568.30

However, since a wind power project is subject to seasonal variations hence to neutralise the seasonal affect over the monitoring period and for a better comparison annual emission reduction achieved by the project activity in year 2012 are being compared with the values mentioned in the PDD for year 2012.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the second monitoring period (01/01/2012 – 31/12/2012)
Total Emission Reductions/Year	182,605	177,041
Days	365	365
ER/day	500.29	485.04

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

The actual emission reductions achieved per day are approximately 14% more during the second monitoring period (6 months) when compared to the estimated values in the PDD (annual value aproportioned for 6 months). As this is only a six months monitoring period, it is not a true comparison with the value mentioned in PDD for over a twelve month period as there are different wind seasons where the emission reductions will be higher for some months and lower for others.

Thus, when we consider 2012 as a whole (01 January – 31 December 2012), the actual emission reductions achieved per day are approximately 3% less during the monitoring period when compared to the estimated values in the PDD.

- - - - -

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		