Monitoring report form
(Version 03.1)

Monitoring report

Title of the project activity	Boreas-1 Enez Wind Power Plant
Reference number of the project activity	GS702
Version number of the monitoring report	5
Completion date of the monitoring report	19/03/2014
Registration date of the project activity	25/04/2013
Monitoring period number and duration of this monitoring period	First verification-01/05/2011-31/07/2013 (both dates included)
Project participant(s)	Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş.
Host Party(ies)	Turkey
Sectoral scope(s) and applied methodology(ies)	Type (i). Renewable Energy Projects Category I.D.: "Grid Connected Renewable Electricity Generation" AMS-1.D version 17.0
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	72,743
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	80,690 as follows per year: 2011-23,534; 2012-37,803; 2013-19,353

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

"Boreas-1 Enez Wind Power Plant project" (hereinafter referred as the Boreas) was be constructed by "Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş." (hereinafter referred as Boreas Enerji) in Edirne province, North West of Turkey. The generation license of the project was issued in 03/05/2007 for 49 years. The project has an installed capacity of **15 MW** and annual generation is estimated to be **52,742 MWh**.

The project site was an empty area on top of a hill which is surrounded by degraded oak forest. There is radio link station on the West end of the site. The project is located 48.7 ha area which belongs to General Directorate of Forestry.

There are six Nordex N90 turbines, each having a capacity of 2.5 MWs. The turbines were purchased from Germany and shipped to Turkey for installation. The electricity is transmitted to substation Enez TM, 154 KV bara via 10 km transmission line.

The purpose of the Project is to produce renewable electricity using wind as the power source and to contribute to Turkey's growing electricity demand through a sustainable and low carbon technology. The project will displace the same amount of electricity generated by the grid dominated with fossil fired power plants. The annual emission reduction estimated by the project is **32,330 tonnes of CO2eq**.

The project has produced positive environmental and economic benefits through the following aspects:

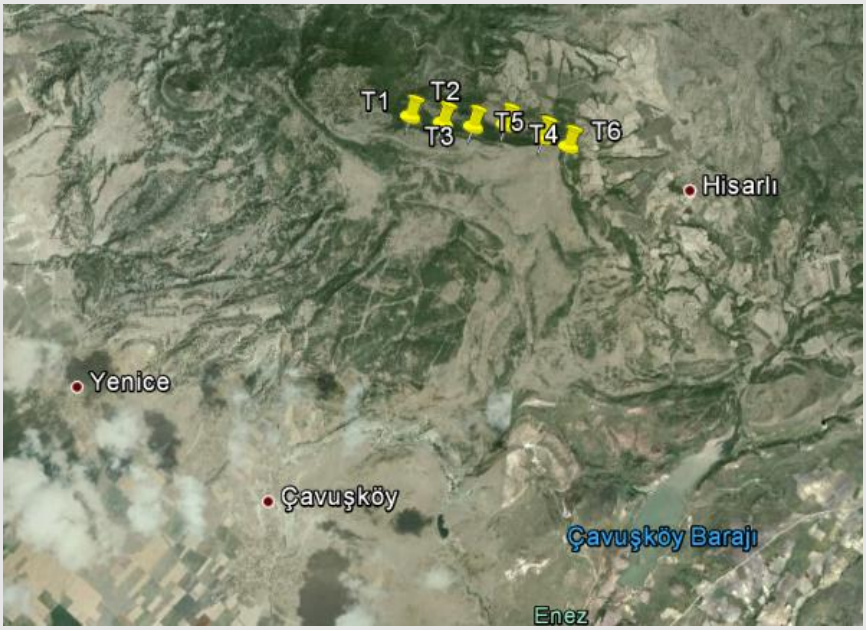
- Displacing the electricity generated by fossil fuel fired power plants by utilising the renewable resources so as to avoid environmental pollution and GHG emissions,
- Contributing the economic development of the region by providing sustainable energy resources,
- Increasing the income and local standard of living by providing job opportunities for the local people.
- Reducing the blackout because of low voltage by lowering required capacity of the transformer.

Figure.1. Nordex N90 2500 HS

The project construction started on June 2009 and was operational on 09 April 2010.

A.2. Location of project activity

The project is located in Enez Township of Edirne Province, Turkey**.** The Turbine 6 is 1km away from Hisarlı Village, which is the nearest residential area.



The coordinates are given below.

Turbine No	Latitude (N)	Longitude (E)
T1	*40° 43' 19.2"*	*26° 10' 50.1"*
T2	*40° 43' 18.3"*	*26° 11' 2.8"*
T3	*40° 43' 18.2"*	*26° 11' 13.7"*
T4	*40° 43' 19.6"*	*26° 11' 25.3"*
T5	*40° 43' 17.1"*	*26° 11' 39.2"*
T6	*40° 43' 15.3"*	*26° 11' 48.5"*

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)	Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş. (private entity)	No

A.4. Reference of applied methodology

The emission reductions of the Project have been calculated in accordance with the approved small scale CDM-methodology AMS-I.D.: "Grid connected renewable electricity generation", version 17.0[1].

For baseline calculations the AMS-I.D refers to the

[1] https://cdm.unfccc.int/UserManagement/FileStorage/TENOK8BM5U3AJIHQZ69YS7CPVDXG41

- "Tool to calculate the emission factor for an electricity system" version 02.2.1[2]
- Tool to calculate project or leakage CO2 emissions from fossil fuel combustion, version.2.0[3]

"Tool to calculate the emission factor for an electricity system" offers two options of which the Combined Margin (CM) approach has been chosen. The CM consists of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the above-mentioned tool.

A.5. Crediting period of project activity

Renewable Crediting Period is selected as the type of crediting. The start date of crediting period is 01/05/2011 two years before the registration date as per the GS guidelines The commissioning date of the power plant is 09/04/2010.

The first crediting period will be 7 years and renewable twice.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The project is implemented as defined in Section A.1 above.
Boreas-1 Enez WPP has 15 MW installed capacity with six Nordex N90 turbines, each having a capacity of 2.5 MWs. The electricity is transmitted to substation Enez TM, 154 KV bara via 10 km transmission line.

B.2. Post registration changes

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

N/A

B.2.2. Corrections

N/A

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

N/A

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

The generation license of the project was revised on 10/09/2013. The installed capacity of the project has been raised to 20 MW with the revision. New turbines are planned to be added to the project, which will be operational in Q3 2014.

B.2.5. Changes to start date of crediting period

N/A

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

N/A

SECTION C. Description of monitoring system

The objective of the monitoring plan is to ensure the complete, consistent, clear, and accurate monitoring and calculation of the emissions reductions during the whole crediting period. The Project Owner is responsible for the implementation of the monitoring plan.

Monitoring Organization and System

The Project Owner will be responsible for the overall management of the monitoring procedures including recording, data collection and store. The consultant will calculate emission reductions based on these monitored data and prepare monitoring report.
Hourly readings are done and noted to a log book by the personnel. At the same time, readings are

[2] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf
[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

automatically transferred to the website of "Market Financial Settlement Center" or PMUM. Project owner can also access the readings by using a secured ID and password identified for each user. PMUM serves as an official unit to balance real time electricity demand with production. Each electricity producer has to report their daily generation forecasts and realized generation to the database run by PMUM.
Monthly power meter readings will be basis for monitoring net electricity fed into the grid. Those readings are done by governmental officers accompanied with an observer from the project owner company at the end of each month. A report is prepared including day, peak and night hour electricity generation of the plant and signed and approved by both parties.
In addition to metering devices every single wind turbine generation will be monitored and the data will be stored through a SCADA system. Through this SCADA system, also other technical specifications of the turbines can be monitored such as temperature, voltage, current, frequency, vibration etc.

Monitoring parameters

According to the methodology applied, the electricity supplied to the national grid by the project and the electricity consumed by the project activity shall be monitored. The net electricity is the difference of the electricity supplied and consumed by the project and shall be taken into account for emission reduction calculations.

Data Management and Quality Control

Two power meters are installed at the grid interface of the project. One is the main meter and the other is back-up meter of the main meter for cross-checking. Both meters are jointly inspected and sealed in order to be protected from interference by any of the parties.

The data is hourly recorded by the personnel on the plant. There is a log book for the purpose. The readings are sent to Trakya Load Dispatching Center beginning at hours 05, 07,09 ,12,15,19,21,23,00 during 24 hour period. At the end of the month, the readings are faxed to Babaeski TEIAS office and Trakya Load Center to be compared and approved. The data could be remotely accessed by PMUM.

The capacity of the transmission line connected is 154 kVA, the accuracy class for main power meter has been defined in the Communiqué for Power Meters[4] as 0.5S class. The back-up meter has the same accuracy class of 0.5S. The calibration will be implemented in accordance with the related standard procedures (IEC-EN 60687) by either TEIAS or the provider company in the name of TEIAS. Both power meters are ELSTER A-1500 model. The serial number for main power meter is 00395381 and the back-up power meter is 00395382. They were calibrated on 18/01/2010.

The power meters have the communication hardware which enables PMUM to reach the data stored and report the errors in reading. If there is need for calibration, governmental officers will be doing it.

When the main meter has a breakdown, the readings of the back-up meter will be used. If both meters failed, conservative data substitution procedures based on the internal SCADA data will be used.
All data collected as part of monitoring will be archived electronically by the project owner and be kept at least for 2 years after the end of the last crediting period.

The line diagram showing the main meter and spare meter is in Annex.2.

Monitoring data for Sustainable Development Matrix Indicators

Environmental and social commitments of the project have been monitored and reported according to the monitoring plan presented in the project passport. The SDI Parameters chosen for monitoring are listed below:

Indicator	Parameter	Way of monitoring	Period
Air Quality	Dust dispersion	Monitored by the local community and Muhktar	Construction phase
Water quality and quantity	Wastewater collection by municipality	Official records	All time
Soil condition	Soil condition	Monitored by the local community and Muhktar	Construction phase
Other pollutants	Noise level	Monitored by the local community and Muhktar	Once for each year of operation
	Solid waste	Official records	Construction phase
Biodiversity	Any damage on natural life reported by the local	Interview with the local community and Muhktar	At the end of first and second year of

[4] http://www2.epdk.gov.tr/mevzuat/teblig/elektrik/sayac/sayac.pdf

	residents.		operation
Quality of Employment	Number of people trained (certificates)	Attendance records or training certificates	Once for each year of operation
Livelihood of the poor	Contribution made to improve the daily life of villagers Contribution made the poorest families.	Visit interviews and documents	During the implementation of the project
Access to affordable and clean energy services	Reduced blackouts and fluctuations	Interview with local people	First verification
Human and institutional capacity	Contributions done for educational and sportive activities.	Invoices of the donations made	During the implementation of the project
Quantitative employment and income generation	Number of temporary and permanent jobs created for local people.	Social Security System records	At the end of the construction phase and each year of operation.
Technology transfer and technological self-reliance	Number of training hours provided by the manufacturer	Attendance sheet	After one year of operation.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$EG_{gross,y}$
Unit:	MWh
Description:	Gross electricity generated by all power plants connected to the national grid including low-cost must run power plants between years 2009-2011
Source of data:	TEIAS (Turkish Electricity Transmission Company) annual data
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	$EG_{net,y}$
Unit:	MWh
Description:	Net electricity generated by all power plants connected to the national grid excluding low-cost must run power plants between years 2009-2011
Source of data:	TEIAS (Turkish Electricity Transmission Company) annual data
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	$EG_{imported,y}$
Unit:	MWh
Description:	Electricity imported to the national grid between years 2009-2011.
Source of data:	TEIAS (Turkish Electricity Transmission Company) annual data
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM

Additional comment:	

Data / Parameter:	$FC_{i,y}$
Unit:	Tonnes/m^3
Description:	Fossil fuel consumed by thermal power plants between years 2008-2011
Source of data:	TEIAS (Turkish Electricity Transmission Company) annual data
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	NCV
Unit:	TJ/mass or volume
Description:	Net calorific value of each fossil fuel type between years 2008-2011
Source of data:	TEIAS (Turkish Electricity Transmission Company) annual data
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	EF_{CO2}
Unit:	tCO_2/TJ
Description:	CO_2 emission factor of fossil fuel type i between years 20082011
Source of data:	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(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	$\eta_{m,y}$
Unit:	-
Description:	Average net energy conversion efficiency of thermal power units connected to the grid
Source of data:	Default values in Annex.1 in "Tool to calculate the emission factor for an electricity system"
Value(s) applied):	Detailed in Appendix. 4
Purpose of data:	Calculation of CM
Additional comment:	

Data / Parameter:	$CAP_{y,total}$
Unit:	MWh
Description:	Capacity addition to the national grid between years 2008-2011
Source of data:	Capacity Projection reports for 2009-2012 by TEIAS (Turkish Electricity Transmission Company)
Value(s) applied):	Detailed in Appendix.4
Purpose of data:	Calculation of CM

Additional comment:	

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter:	EG_y
Unit:	*MWh/yr*
Description:	*Net electricity exported to the grid in the year y*
Measured/ Calculated / Default:	*Measured*
Source of data:	*Meter Reading Forms issued by governmental officers and signed by both parties.*
Value(s) of monitored parameter:	*38,391.92 MWh for 2011* *61,668.61 MWh for 2012* *31,570.96 MWh for 2013*
Monitoring equipment:	*The net electricity is measured continuously by a power meter at the grid interface and recorded monthly.*
Measuring/ Reading/ Recording frequency:	*Monthly readings*
Calculation method (if applicable):	N/A
QA/QC procedures:	• *A spare meter is used for crosschecking the accuracy and both meters are calibrated if required.* • *Data measured by meters and will be crosschecked with the data uploaded to PMUM.*
Purpose of data:	*Calculation of emission reductions*
Additional comment:	

Sustainable Development Matrix Indicators

No		1
Indicator		**Air Quality**
Mitigation measure		• Loading and unloading without blowing the material • Watering the circulation road if required • No explosives will be used.
Chosen parameter		Dust dispersion
Current situation of parameter		None
Future target for parameter		No disturbance to the local community
Way of monitoring	How	Monitored by the local community and Muhktar.
	When	Construction phase
	By who	Project Owner

No	2
Indicator	**Water quality and quantity**
Mitigation measure	Wastewater will be collected by the local municipality
Chosen parameter	Wastewater collection by the municipality.
Current situation of parameter	None

Estimation of baseline situation of parameter		No wastewater discharge to the environment.
Future target for parameter		No wastewater discharge to the environment.
Way of monitoring	How	Official records
	When	All the time
	By who	Project owner

No		3
Indicator		**Soil condition**
Mitigation measure		Excavated material will be deposited and disposed properly.
Chosen parameter		Soil condition
Current situation of parameter		None
Estimation of baseline situation of parameter		No excavated material exists in the field.
Future target for parameter		None
Way of monitoring	How	Monitored by the local community and Muhktar.
	When	During construction
	By who	Project Owner

No		4
Indicator		**Other pollutants**
Mitigation measure		Turbines with reduced noise operation systems will be selected.
Chosen parameter		Noise level
Current situation of parameter		Below limits allowed by Turkish regulations.
Estimation of baseline situation of parameter		Below limits allowed by Turkish regulations.
Future target for parameter		No disturbance for the local community
Way of monitoring	How	Monitored by the local community and Muhktar.
	When	Once for each year of operation
	By who	Project owner

No		5
Indicator		**Other pollutants**
Mitigation measure		Solid waste will be collected by the municipality
Chosen parameter		Solid waste collected
Current situation of parameter		No solid waste on the site
Estimation of baseline situation of parameter		No solid waste on the site
Future target for parameter		No solid waste on the site
Way of monitoring	How	Official records
	When	During construction
	By who	Project owner

No		6
Indicator		**Biodiversity**
Mitigation measure		• The turbines are located along with the existing road to avoid tree cutting. • The blades will be painted to minimize the risk of collision of birds.
Chosen parameter		Any damage on natural life reported by the local residents.
Current situation of parameter		None
Estimation of baseline situation of parameter		None
Future target for parameter		No harm
Way of monitoring	How	Interview with the local community and Muhktar.
	When	At the end of the first and second year of operation
	By who	Consultant

No		7
Indicator		**Quality of employment**
Mitigation measure		N/A
Chosen parameter		Number of training sessions held
Current situation of parameter		N/A
Future target for parameter		5
Way of monitoring	How	Attendance records or training certificates
	When	Once for each year of operation
	By who	Project Owner

No		8
Indicator		**Livelihood of the poor**
Mitigation measure		N/A
Chosen parameter		Contribution made to the poorest families.
Current situation of parameter		N/A
Future target for parameter		Donations will be made
Way of monitoring	How	Visit interviews with local stakeholders and other proofing documents
	When	Annually
	By who	Consultant

No		9
Indicator		**Livelihood of the poor**
Mitigation measure		N/A
Chosen parameter		Contribution made to improve the daily life of villagers.
Current situation of parameter		N/A
Future target for parameter		• The cemeteries are covered with fence to avoid wild animals enter and damage graves • The local water fountain have been improved by pouring concrete • Village roads are renewed by the project owner. • Contributed to local economy by shopping from local market and renting houses • Help municipality by giving heavy construction equipment for their use.
Way of monitoring	How	Visit interviews with local stakeholders and other proofing documents
	When	Annually
	By who	Consultant

No		10
Indicator		**Access to affordable and clean energy services**
Mitigation measure		N/A
Chosen parameter		Reduced blackouts and fluctuations
Current situation of parameter		The project has contributed to maintain high voltage level in the region. This has caused reduced blackout and fluctuations in the region.
Future target for parameter		N/A
Way of monitoring	How	Interview with local people
	When	First verification
	By who	Consultant

No		11
Indicator		**Human and institutional capacity**
Mitigation measure		N/A
Chosen parameter		Contributions done for educational and sportive activities.
Current situation of parameter		N/A

Future target for parameter		Contributions will be done to the local sports team
Way of monitoring	How	Invoices of the donation made
	When	During the implementation of the project
	By who	Project Owner

No		12
Indicator		**Quantitative employment and income generation**
Mitigation measure		N/A
Chosen parameter		Number of temporary and permanent jobs created for local people.
Current situation of parameter		Temporary jobs were created for local employees during construction. Ten personnel are permanently working for operation.
Future target for parameter		Consistency in the number of jobs created.
Way of monitoring	How	Social Security System records
	When	At the end of the construction phase and each year of operation.
	By who	Project developer

No		13
Indicator		**Technology transfer and technological self-reliance**
Mitigation measure		N/A
Chosen parameter		Number of training sessions provided by the manufacturer
Current situation of parameter		No wind farm exists at that region in the current situation.
Future target for parameter		Consistency in the number of training hours mentioned in the contract with the manufacturer.
Way of monitoring	How	Attendance sheet
	When	After one year of operation.
	By who	Project Owner

D.3. Implementation of sampling plan

15 MW Boreas-1 Enez Wind Power Plant was registered as Voluntary Emission Reduction under Gold Standard scheme on 25/04/2013. The project has generated **131,631,490 MWhs** green electricity and reduced **80,690 tonnes of CO2eq** during the first monitoring period. Considering the fossil fuel based electricity generation in the country, the project contributed to decreased fossil fuel consumption as well as a more sustainable development.

The power meters were calibrated on 18/01/2010 before the commissioning date of the power plant. The main and spare meter readings are recorded monthly and cross-checked whether calibration is required. The capacity of the transmission line connected is 154 kVA, the accuracy class for power meters have been defined in the Communiqué for Power Meters5 as 0.5S class. The calibration will be implemented in accordance with the related standard procedures (IEC-EN 60687). The periodical maintenance is under the responsibility of TEDAS (Turkish Electricity Distribution Company) and has been fixed as once in 10 years in accordance with Article.9 of Measure and Metering Devices Regulation[6]. Therefore; the next calibration will be 10 years later on 2020.

The table below shows the baseline emissions for the verification period:

No	Months	Electricity Supplied to the Grid (kWh)	Electricity Consumed by the Project (kWh)	Net Electricity Supplied (kWh)	Emission reductions achieved (tCO2)
1	May 2011	4,540,800	5,170	4,535,630	2,780
2	June 2011	3,167,640	7,130	3,160,510	1,937
3	July 2011	2,825,310	8,930	2,816,380	1,726
4	August 2011	5,312,250	2,730	5,309,520	3,255

[5] http://www2.epdk.gov.tr/mevzuat/teblig/elektrik/sayac/sayac.pdf
[6] http://www.mevzuat.adalet.gov.tr/html/21179.html

5	September 2011	4,941,400	2,350	4,939,050	3,028
6	October 2011	6,437,880	4,100	6,433,780	3,944
7	November 2011	6,079,280	3,270	6,076,010	3,725
8	December 2011	5,126,650	5,610	5,121,040	3,139
TOTAL 2011				**38,391,920**	**23,534**
1	January 2012	5,323,850	6,840	5,317,010	3,259
2	February 2012	5,212,160	7,470	5,204,690	3,190
3	March 2012	4,671,010	7,340	4,663,670	2,859
4	April 2012	6,062,070	2,520	6,059,550	3,715
5	May 2012	3,842,030	5,860	3,836,170	2,352
6	June 2012	4,578,490	7,080	4,571,410	2,802
7	July 2012	4,818,080	5,830	4,812,250	2,950
8	August 2012	4,067,190	5,830	4,061,360	2,490
9	September 2012	5,376,610	5,350	5,371,260	3,293
10	October 2012	5,178,130	5,680	5,172,450	3,171
11	November 2012	6,752,510	3,330	6,749,180	4,137
12	December 2012	5,854,390	4,780	5,849,610	3,586
TOTAL 2012				**61,668,610**	**37,803**
1	January 2013	5,381,270	9,370	5,371,900	3,293
2	February 2013	4,182,100	5,480	4,176,620	2,560
3	March 2013	4,765,970	5,910	4,760,060	2,918
4	April 2013	4,144,140	8,200	4,135,940	2,535
5	May 2013	4,953,720	5,770	4,947,950	3,033
6	June 2013	3,230,370	8,860	3,221,510	1,975
7	July 2013	4,962,580	5,600	4,956,980	3,039
	TOTAL 2013			**31,570,960**	**19,353**
GRAND TOTAL				**131,631,490**	**80,690**

Being a small sized project, 15 MW Boreas-1 Enez WPP did not have any significant environmental impacts on the region. It is neither located on naturally protected site nor on any migration route.

The local community is the best observer of the habitat and they are consulted in that sense. The following indicators have been monitored by interviews with local community and Muhktar. The table blow shows the parameter and interview questions asked to the local people affected by the project:

No	Indicator	Parameter	Interview question
1	Air Quality	Dust Dispersion	Was there any disturbance because of the dust dispersion during construction phase?
3	Soil Condition	Soil Condition	Were excavated pits closed? Did any rehabilitation measures implemented in wind power plant area?
4	Other Pollutants	Noise Level	Are you annoyed with the noise pollution of the turbines?
6	Biodiversity	Any damage on natural life reported by the local residents.	Did you observe any harm to animals, particularly on birds, of the wind turbines?
8 &9	Livelihood of the poor	1) Contribution made to the poorest families. 2) Contribution made to improve the daily life of villagers.	Did project Owner made the following contributions to your village? 1) Contribution made to the poorest families. 2) The cemeteries are covered with fence to avoid wild animals enter and damage graves 3) The local water fountain have been improved by pouring concrete 4) Village roads are renewed by the project owner. 5) Contributed to local economy by shopping from local

			market and renting houses
10	Access to affordable and clean energy services	Reduced blackouts and fluctuations	Did you observe a decrease in the number of electricity cuts after the operation of wind power plant? Is there any improvement in the electricity services?

Nobody presented any disturbance to the natural life. In addition, the local community has no complaints about noise as the project is away from residential areas. Please see interview records with the local residents in Annex.1.

The Project Owner also helped the Municipality by giving heavy construction equipment for their use. This has been stated during the interview with mayor on the site visit for validation.

The table below shows the SD matrix indicators monitoring results:

No	Indicator	Parameter	Justification	Documentary proof
1	Air Quality	Dust dispersion	No complaints of dust dispersion have been received from local community.	Feedback round meeting done 09.Nov. 2009 and interview records with Muhktar and local community.
2	Water quality and quantity	Wastewater collection by municipality	Wastewater has been collected twice by local companies serving to the municipality.	Two invoices are presented as the proof: • For construction phase dated as 23/02/2010. • For operational phase dated as 09/09/2012.
3	Soil condition	Soil condition	No complaints or observation of excavated material left after construction.	Feedback round meeting done 09.Nov. 2009 and interview records with Muhktar and local community.
4	Other pollutants	Noise level	No complaints by the local community.	Interview records with Muhktar and villagers
5		Solid waste	Municipality confirms to receive all solid waste by trucks during construction period.	Confirmation letter for construction phase from the municipality
6	Biodiversity	Any damage on natural life reported by the local residents.	No damage observed	Interview records with local community and Muhktar
7	Quality of Employment	Number of training sessions held	5 training sessions were held	Certificates
8	Livelihood of the poor	Contribution made to the poorest families.	Muhktar and local community members confirm that donations were made to the poor.	Interview records with Muhktar and villagers.
9		Contribution made to improve the daily life of villagers	Muhktar and local community members confirm the following contributions: - The cemeteries are covered with fence to avoid wild animals enter and damage	Interview records with Muhktar and villagers.

			graves - The local water fountain have been improved by pouring concrete - Village roads are renewed by the project owner. - Local economy benefitted from the project implementation.	
10	Access to affordable and clean energy services	Reduced blackouts and fluctuations	The project has contributed to maintain high voltage level in the region. This has caused reduced blackout and fluctuations in the region.	Interview records with Muhktar and villagers.
11	Human and institutional capacity	Contributions done for educational and sportive activities.	The project owner made donation to local sport club	Bank order for the donation made.
12	Quantitative employment and income generation	Number of temporary and permanent jobs created for local people.	- During the construction process 110 workers have been hired. - 2 technicians work for Nordex. - There are 5 electrical technicians, 1 administrative officer, 1 cook (7 personnel in total) from local community working permanently in wind farm. - 5 security guards work on shift 24 hours. - 14 personnel are working for Boreas in total.	Social Security Records Training records
13	Technology transfer and technological self-reliance	Number of training hours provided by the manufacturer	Theoretical and practical safety instruction training has been given to 2 Nordex personnel and 1 Boreas personnel.	Certificates

On the local scale, the wind power is a new a technology in the region and very well welcomed by the public. The project owner made improvements to daily life of local community; which shows the project owner's good intentions for better environmental conditions in the region. The contributions done to the community in order to support livelihood of the poor was an act of supporting the economic and social life and expression of being a part of the community not just an investor.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor:

$BE_y=EG_{PJ,y}*EF_{grid,CM,y}$ (6)

where :

BE_y	: Baseline emissions in year y (tCO_2/y)
$EG_{PJ,y}$	: Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{grid,CM,y}$	:Combined margin CO_2 emission factor for grid connected power generation in year y calculated by using the latest version of the "Tool to calculate the emission factor for an electricity system " (tCO_2/MWh)

$EF_{grid,CM,y}$ value is fixed as **0.613 tCO_2/MWh** for the crediting period of seven years.

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

Project emissions are taken as zero as per the methodology.

E.3. Calculation of leakage

According to the AMS-I.D. (version 17), leakage should be considered if the energy generating equipment is transferred from another activity. The project is a new power plant and therefore the leakage is taken as zero.

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_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	80,690 as follows per year: 2011-23,534; 2012-37,803; 2013-19,353	0	0	80,690

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_2e)	72,743	80,690 as follows per year: 2011-23,534; 2012-37,803; 2013-19,353

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

The baseline emission calculations are based on the electricity generation of the power plant. The amount of electricity generation is based on several factors; such as meteorological conditions, the efficiency of turbines and age of power plant. The estimated annual electricity generation in PDD is the average annual electricity generation for 20 years, which is the economic life of wind turbines. This value of 52,742 MWh, equals to the capacity factor for P90 (which means the risk that amount of production is not reached is 10%) from

Micrositing Report (sub-step 2. Calculation and Comparison of financial indicators, Section B.5 Demonstration of additionality of PDD, page 17) The early years of generation are generally higher than the average as the equipment is new. By the time the turbines are worn out, the annual generation generally decrease below the average.

The first year of operation, 2010, the annual generation was 34,986 MWh for 9 months. The power production estimated for 9 months is 39,556.5 MWh on average monthly basis. This is slightly lower than expected. The electricity generation is higher in spring and autumn seasons; during January to May and September to December as could be seen from the following years' generation data in the Table above in Section **D.3. Implementation of sampling plan.** The power production missing for January and March decreased the average expected monthly amount (52,742/12=4,395.2 MWh/month).

The second and third years of operation (2011 and 2012) have generated 60,008.3 MWh and 61,668.6 MWh electricity, respectively. As stated above, the performance of equipment would be higher in early years of production and will decrease later on the following years.

The fourth year of operation, 2013, the total generation was 31,571 MWh for 7 months, which is slightly higher than the expected average of 7 months 30,766 MWh. This is again due to the performance of the new equipment.

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_2e)	61,337	19,353

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Document information

Version	*Date*	*Description*
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).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: issuance
Keywords: monitoring report, performance monitoring

ANNEX-1

Evaluation Forms for Sustainable Matrix Indicators

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 15./.03/2013 YER: Hisarli....KÖYÜ
ADINIZ VE SOYADINIZ: ALİ ÖNER TELEFONUNUZ: 0535 320 82 53 MESLEĞİNİZ: ÇİFTÇİ-EMEKÇİ

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	HAYIR-OLMADIK
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	EVET-YAPILDI
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	HAYIR
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	HAYIR-
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1-EVET-EDİLDİ 2-EVET 3-HAYIR(ÖYG Bİ TALEP OLMADI/BEKLİYOR) 4-İYİLEŞTİRİLDİ 5-EVET-KULU-KOYUN SATTIK
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	EN AZINDA DÜZÜK CEYRAN KALMADI, VOLTAJ YÜKSELDİ.

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 15./.03./2013 **YER:** HİSARLI ..... **KÖYÜ**
ADINIZ VE SOYADINIZ: Yusuf KARTAL ..... **TELEFONUNUZ:** 0-543-660-15-02 ..... **MESLEĞİNİZ:** İMAM .....

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	HAYIR.
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	EVET.
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	Hayır. bize bir zararı yok
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	Hayır. Aksine hayvanlar etrafında otluyor.
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1. Yapıldı. 2. Evet 3. İhtiyaç yoktu. 4. Evet 5. Sağlandı.
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	Evet. Azaldı.

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 15./.03./2013 **YER:** YAZIR ..... **KÖYÜ**
ADINIZ VE SOYADINIZ: Vedat AVCU. **TELEFONUNUZ:** 0533 787 92 87 ..... **MESLEĞİNİZ:** çiftçi-muhtar

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	HAYIR
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	EVET
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	HAYIR
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	HAYIR
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1. EVET 2. EVET 3. EVET 4. EVET 5. EVET
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	EVET

Vedat AVCU

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 16./.03./2013 **YER:** Uzar ..... **KÖYÜ**
ADINIZ VE SOYADINIZ: Ahmet TEZCAN **TELEFONUNUZ:** 0542 341 08 07 **MESLEĞİNİZ:** Çiftçi

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	HAYIR
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	EVET
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	HAYIR
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	HAYIR
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1) EVET 2) EVET 3) EVET 4) EVET 5) EVET
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	EVET

Ahmet TEZCAN

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 16./.03./2013 **YER:** HİSARLI **KÖYÜ**
ADINIZ VE SOYADINIZ: Emin Naz ..... **TELEFONUNUZ:** 0542 405 37 77 **MESLEĞİNİZ:** Eski Muhtar

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	Hayır.
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	Evet.
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	Yok.
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	Hayır.
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1= Evet 2= Evet 3= Hayır. (Talep edilmedi) 4= Hayır. 5= Evet
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	Evet.

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 16/..04/2013 **YER:** YAZIR ..**KÖYÜ**
ADINIZ VE SOYADINIZ: Şevket PELVAN **TELEFONUNUZ:** 0535 912 4484 **MESLEĞİNİZ:** Ormancılıktan Pensiyonu

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	Hayır
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	Evet
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	Hayır
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	Hayır
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	1- Evet 2- Evet 3- Evet 4- Evet 5- Evet
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	Evet

Şevket PELVAN

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 17/04/2013 **YER:** Hisarlı ..**KÖYÜ**
ADINIZ VE SOYADINIZ: Ali Osman Özkalay **TELEFONUNUZ:** 0284 831 3665 **MESLEĞİNİZ:**

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	Hayır, yollara beyaz asfalt atılmıştı.
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	Evet kapatıldı, çevre düzenlemesi yapıldı.
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	Uzaktayız, bizim için rahatsız edici bir gürültü yok.
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	Hayvanlara ya da kuşlara zararı olduğunu duymadım.
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	Keskin viraj'lı yollarda genişletme yapıldı. Mezarlıklar çitlerle çevrildi.
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	Enez merkezde etkisi olabilir, nüfus yoğun ancak köyde böyle bir etki hissetmedik.

İMZANIZ

BOREAS-1 ENEZ RÜZGAR ENERJİ SANTRALİ
ŞİKAYET/ÖNERİ FORMU

TARİH: 17./04/2013 **YER:** Hisarlı....**KÖYÜ**
ADINIZ VE SOYADINIZ: Sabiye Şen..... **TELEFONUNUZ:** 0284 831 3896..... **MESLEĞİNİZ:**.....

Parametre	Sorular	Cevaplar
Hava kirliliği	İnşaat dönemi boyunca oluşan toz bölgeye rahatsızlık verdi mi?	Hayır
Toprak kalitesi	İnşaat sırasında kazılan yerler kapatıldı mı? Rüzgar santrali çevre düzenlemesi yapıldı mı?	Kapatıldı, etrafı düzenlendi. Tertemiz durumda
Gürültü seviyesi	Rüzgar türbinlerinden kaynaklanan gürültü rahatsızlığı var mı?	Hayır, rahatsızlık veren gürültü yok.
Bioçeşitlilik	Rüzgar türbinlerinin hayvanlara, özellikle kuşlara zararı olduğunu gördünüz mü?	Hayır, türbinler telörgülerle çevrili, hayvan otlatılabiliyor. Kuşlara zararı olduğunu duymadım.
Sosyal katkılar	Proje sahibi köyünüze aşağıdaki katkıları gerçekleştirdi mi? 1. Köyümüzdeki yoksul ailelere yardım edildi. 2. Mezarlıklar çitlerle çevrelendi. 3. Çeşmeler beton dökülerek düzeltildi. 4. Yollar iyileştirildi. 5. Santral ihtiyaçları köylerden sağlandı, esnafa katkı sağlandı.	Yapılan katkılardan haberim yok. Muhtara sorabilirsiniz.
Temiz ve ucuz enerjiye erişim	Rüzgar santrali işletmeye alındıktan sonra elektrik kesintileri azaldı mı? Elektrik hizmetlerinde iyileşme oldu mu?	Evet, azaldı.

İMZANIZ

ANNEX-2

Line Diagram