



**Monitoring report form for CDM project activity
(Version 06.0)**

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

Title of the project activity	Boreas-1 Enez Wind Power Plant	
UNFCCC reference number of the project activity	GS702	
Version number of the PDD applicable to this monitoring report	8	
Version number of this monitoring report	6	
Completion date of this monitoring report	15/04/2019	
Monitoring period number	Second verification period	
Duration of this monitoring period	12/11/2015-24/04/2018	
Monitoring report number for this monitoring report	1	
Project participants	Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş.	
Host Party	Turkey	
Sectoral scopes	Energy industries (renewable - / non-renewable sources)	
Applied methodologies and standardized baselines	AMS-I.D.: Grid connected renewable electricity generation --- Version 17.0	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	-	82,627
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	79,186	

SECTION A. Description of project activity

A.1. General description of project activity

“Boreas-1 Enez Wind Power Plant Project” was be constructed by “Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş.” in Edirne province, North West of Turkey. The generation license of the project was issued in 03/05/2007 for 49 years. The project’s registered installed capacity is 15 MW and annual generation is estimated to be 52,742 MWh. The annual emission reduction estimated by the project is 32,330 tonnes of CO₂eq.

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 added units are Nordex N100 turbines with an installed capacity of 3.3 MWs. However, the N100 turbines would be operated as 2. 5 MWs due to power limitation according to the generation license. 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 generation license of the project was revised on 26/06/2013. The installed capacity of the project has been raised to 20 MW with the revision. Two turbines were added to the project on 16/04/2015 and 01/08/2016, respectively. Since the registered capacity of the project is considered, the electricity generation and the emission reduction of the added units will be ignored.

Total electricity generation and emission reduction in this monitoring period has been calculated as 134,792 MWh and 82,627 tCO₂eq, respectively.

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.

A.2. Location of project activity

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

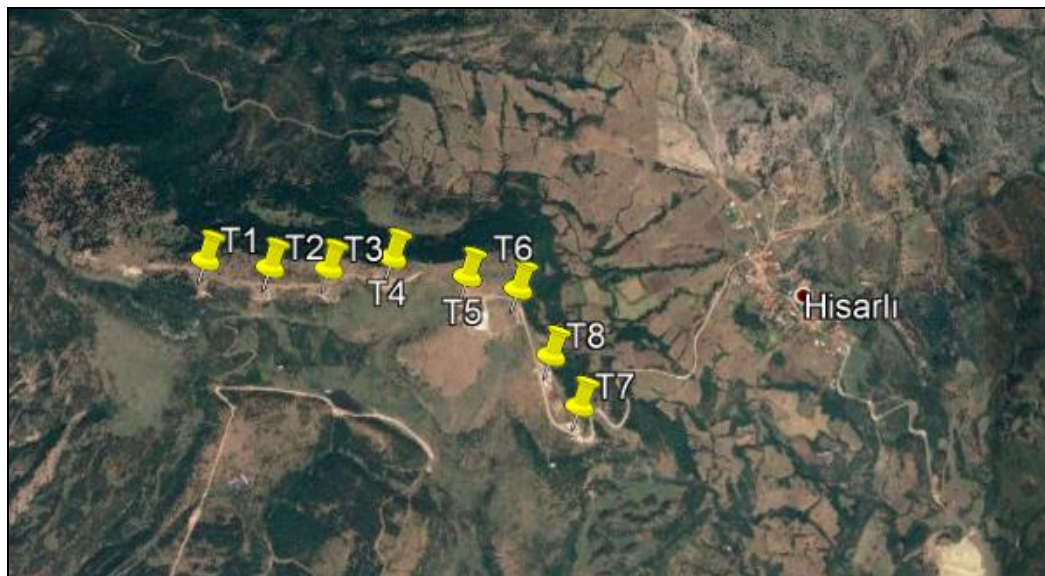


Figure 1. The Project Area

The coordinates of the project (including the added capacity) may be seen in Table 1:

Table 1- Project Coordinates

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"
T7	40°42'55.21"	26°11'56.77"
T8	40°43'2.28"	26°11'51.65"

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (host Party)	Boreas Enerji Üretim Sistemleri Sanayi ve Ticaret A.Ş. (private entity)	No

A.4. Reference to applied methodologies and standardized baselines

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 17.0¹.

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

- Tool to calculate the emission factor for an electricity system, version 02.2.1²
- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, version.2.0³

“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 type and duration

Renewable Crediting Period is selected as the type of crediting. The start date of the first crediting period is 25/04/2011 two years before the registration date as per the GS guidelines. At the same time, the first monitoring period was started on 01/05/2011 as concluded by GS.⁴ The commissioning date of the power plant is 09/04/2010. The crediting period end date is 24/04/2018.

The first crediting period is 7 years and renewable twice.

The reason of the difference for the previous monitoring period end date and start date of this monitoring period is detailed under section B.2.5.

SECTION B. Implementation of project activity

B.1. Description of implemented 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.

The project comprises installation of six NORDEX N90/2500HS kW wind turbine generators with 80 m hub height. As an all-round turbine in the 2.5 MW product line, the N90/2500 can be deployed at strong wind sites. With different tower heights, it covers wind class IEC 1.

The project was operational on 09/04/2010 and registered on 25/04/2013 under the Gold Standard Registry with the registration number GS 702. The project timeline is given in the table below:

Table 2- Project Timeline

	Activity	Date
1	Generation License	03/05/2007
2	Proposal for loan agreement (active with EM contract)	12/06/2008
3	Board decision for carbon asset development	04/09/2008
4	Contract agreement with EM supplier –conditional (active with down payment)	05/09/2008

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ>

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>

⁴ The conclusion may be seen in Final_GS_702_Issuance review_06-05-2014 and available to the DOE.

6	The reservation payment for EM supplier	15/10/2008
7	Proposal for carbon asset development	17/11/2008
8	Construction agreement for switchyard	17/02/2009
9	Stakeholder meeting	29/04/2009
10	Commissioning date	09/04/2010
11	Generation License amendment (capacity Increase to 20 MW)	26/06/2013
12	Board decision for carbon asset consideration of capacity increase	09/07/2013
13	Agreement with EM supplier for capacity increase	8/11/2013
14	Construction agreement for capacity increase	11/08/2014
15	Loan Agreement for capacity increase	19/08/2014

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

N/A

B.2.2. Corrections

N/A

B.2.3. Changes to the start date of the crediting period

N/A

B.2.4. Inclusion of monitoring plan

N/A

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

15 MW Boreas - 1 Enez Wind Power Plant was registered as Voluntary Emission Reduction under Gold Standard scheme on 25/04/2013. The generation license of the project was revised on 26/06/2013 and the installed capacity of the project has been raised to 20 MW with the revision. Two turbines were added to the project on 16/04/2015 and 01/08/2016, respectively.

During this period, the project contributed to decreased fossil fuel consumption as well as a more sustainable development by generating 192,042 MWh and thus the reduction of 117,720 tonnes of CO₂eq. These values represent the generation and emission reduction of the power plant including also the capacity increase. For the aim of reaching the actual values derived from the registered capacity, the ratio between the feasibility studies of the registered and added capacities will be considered. Thus, baseline emissions will be based on the adjusted net electricity supplied to the grid. The adjusted net electricity is 134,792 MWh and the baseline emissions total to 82,627 tonnes of CO₂eq for this monitoring period. The 'adjusted net electricity supplied to the grid' is calculated as below:

Adjusted net electricity supplied to the grid = $EG_{PJ,y} - (EG_{PJ,y} \times \text{Expected Generation of Added Capacity/Expected Generation after Capacity Increase})^5$

In addition to this, as per GS guidelines, the Project Owner can only claim credits generated in the period of three years prior to second verification site visiting date so, the generated electricity and the baseline emissions between the dates 12/11/2015 and 24/04/2018 are considered, since the site visit for the second monitoring period was realized on 12/11/2018 and the first crediting period end on 24/04/2018.

Considering the net electricity exported to the grid, EPIAS records are used as the main source rather than the Meter Reading Forms. The reason is that the Meter Reading Forms were issued by the governmental officers and signed by both parties. Currently, the forms are filled by the project owner and approved by the governmental officers. Additionally, the remote reading by the governmental body is also available. Since the system has changed, EPIAS records are preferred as the main source by the DOE.

B.2.6. Changes to project design

The generation license of the project was revised on 26/06/2013. The installed capacity of the project has been raised to 20 MW with the revision. Two turbines were added to the project on 16/04/2015 and 02/08/2016, respectively.

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 is responsible for the overall management of the monitoring procedures including recording, data collection, calculating emission reductions and project emissions.

TEIAS is performing remote reading of the meters and monthly power meter readings are the basis for monitoring net electricity fed into the grid. A measuring protocol is prepared including day, peak and night hour electricity generation by the project owner and approved by governmental officers at the end of each month.⁶

EPIAS⁷ records are the main source for the quantity of the net electricity. EPIAS is the financial settlement centre of TEIAS (the national grid operator). The website of EPIAS is accessible to Project owner with their unique user ID and password. Once accessed, the Project owner is able to call electricity generation and consumption reports of their own projects. The same reports are used by the Project owner for invoicing TEIAS. The electricity generation data is reported monthly basis. The EPIAS records are crosschecked with the meter reading forms.

⁵ The adjustment has been done upon the total electricity generation instead of the net electricity supplied to the grid. The whole electricity withdrawn from the grid has been subtracted from the adjusted electricity generation to reach adjusted net electricity supplied.

⁶ The monthly reading protocols are available to the DOE.

⁷ PMUM has been replaced by EPIAS as of 01/09/2015 in Turkey during the verification period. Retrospective data is accessible via EPIAS.

In addition to metering devices, every single wind turbine generation is monitored and the data is 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.

The electricity is transmitted to substation Enez TM, 154 KV bara via 10 km transmission line. The single line diagram of Boreas-1 Enez Wind Power Plant is provided below:

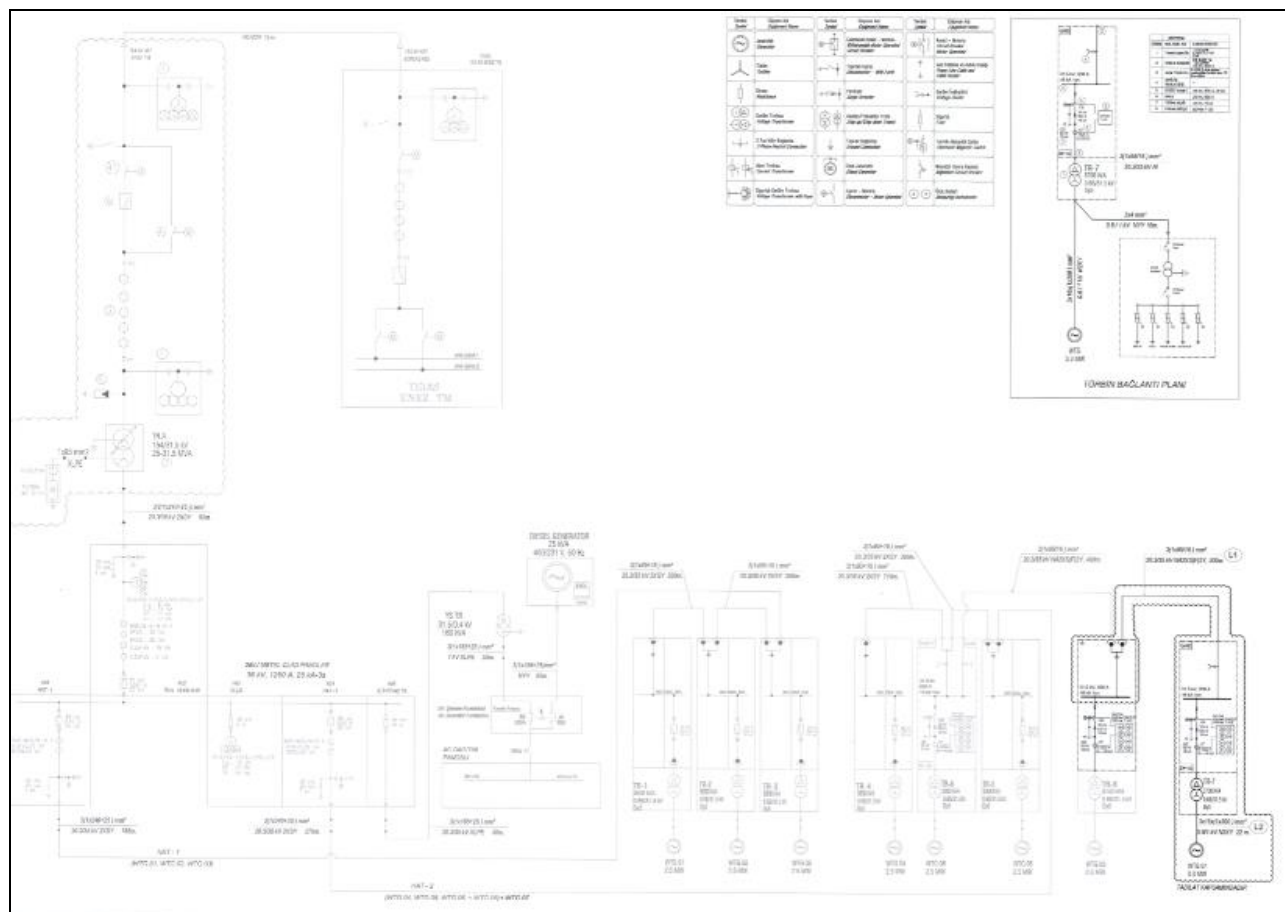


Figure 2. The Single Line Diagram of Boreas-1 Enez Wind Power Plant

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. Trakya Load Dispatching

Center also executes remote reading during 24-hour period. At the end of the month, the readings are sent via e-mail to Babaeski TEIAS office and Trakya Load Center to be compared and approved. The data could be remotely accessed by TEIAS.

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 as 0.2S class. The back-up meter has the same accuracy class of 0.2S. 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.. 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. Both power meters are EMH model, 0.2S class. The serial number for main power meter is 5316624 and the back-up power meter is 5316625. The previous power meters indicated in the first monitoring report (ELSTER A-1500 model) were changed on 26/11/2015 due to breakdown⁸. The meters are tested on yearly basis. After the change of the meters in 2015, periodic tests were conducted on 17/12/2016 and 02/12/2017⁹.

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.

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 Sustainable Development Indicators (SDI) chosen for monitoring are listed below. The indicators to be monitored during each monitoring period are provided in section D.2.

Table 3- The Sustainable Development Indicators

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 Mukhtar	Once for each year of operation
Biodiversity	Any damage on natural life reported by the local residents	Interview with the local community and Muhktar	At the end of first and second year of 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	Visit interviews and documents	During the implementation of the project
	Contribution made the poorest families.		
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

⁸ The protocol is available to the DOE

⁹ The test records are available to the DOE.

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 selfreliance	Number of training hours provided by the manufacture	Attendance sheet	After one year of operation

The project did not have any significant environmental impacts on the region. It is neither located on naturally protected site nor on any migration route. Besides, the capacity addition of which its generation and emission reduction will not be considered, has been built in the existing project area. The document, "EIA is not required", which has been received after capacity increase is also available to the DOE.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

(Copy this table for each data or 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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	-

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 in the PDD

Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

Data/Parameter	EF_{CO_2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor of fossil fuel type i between years 2008-2011
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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

Data/Parameter	$CAP_{y,total}$
Unit	-
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 in the PDD
Choice of data or measurement methods and procedures	Official data
Purpose of data/parameter	Calculation of CM
Additional comments	

D.2. Data and parameters monitored

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	EPIAS records as mentioned in Section C. Net electricity exported is crosschecked with Meter Reading Forms issued by Project owner and approved by governmental officers (When the PDD was issued the system worked as: The Meter Reading Forms were issued by the governmental officers and signed by both parties. Currently, the forms are filled by the project owner and approved by the governmental officers. Additionally, the remote reading by the governmental body is also available). Since the system has changed EPIAS records are considered as the main source.
Value(s) of monitored parameter	7,699.44 MWh for 2015 56,767.19 MWh for 2016 51,393.23 MWh for 2017 18,931.85 MWh for 2018

Monitoring equipment	The net electricity is measured continuously by a power meter at the grid interface and recorded monthly.		
	Power meters:		
		Main Power Meter	Back-up Power Meter
	Manufacturer	EMH	EMH
	Serial Number	5316624	5316625
	Date of Installation	26/11/2015	26/11/2015
	The Test Date of the Meters	02/12/2017	02/12/2017
	Accuracy of meters	0.2S class	0.2S class
	The previous power meters used in the first monitoring period were ELSTER A-1500 model. The serial number for main power meter was 00395381 and the back-up power meter is 00395382 ¹⁰ .		
Measuring/reading/recording frequency	Monthly readings		
Calculation method (if applicable)	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. For the aim of reaching the actual values derived from the registered capacity (15 MW), the ratio between the feasibility studies of the registered and added capacities will be considered. Thus, baseline emissions will base on the adjusted net electricity supplied to the grid.		
QA/QC procedures	• A spare meter is used for crosschecking the accuracy and both meters are calibrated if required. • EPIAS records are considered as the main source for the net electricity and the values are crosschecked with the data measured by meters. • TEİAŞ is responsible for calibration and maintenance of the devices. The periodical calibration or maintenance is under the responsibility of TEİAŞ and has been fixed as once in 10 years.¹¹ Since TEİAŞ meters are sealed by TEİAŞ, the project proponent cannot intervene with the devices. The periodic tests are executed on annual basis. • Last two metering tests were performed on 17/12/2016 and 02/12/2017¹². • Latest calibration of testing instrument was performed on 26/11/2015.¹³		
Purpose of data/parameter	Calculation of emission reductions		
Additional comments			

¹⁰ The protocol for the meter change is available to the DOE.

¹¹ <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch>

¹² Both tests for 2016 and 2017 are available to the DOE.

¹³ Both Meter Change Protocol and the Guarantee Document from the meter producer is available to the DOE.

Sustainable Development Matrix Indicators

Data/Parameter	Water Quality (SDI 2)
Unit	N/A
Description	Wastewater has been collected twice by local companies serving to the municipality
Measured/calculated/default	N/A
Source of data	Waste water disposal invoice ¹⁴
Value(s) of monitored parameter	N/A
Monitoring equipment	N/A
Measuring/reading/recording frequency	All the time
Calculation method (if applicable)	N/A
QA/QC procedures	N/A
Purpose of data/parameter	Sustainability monitoring parameters
Additional comments	

Data/Parameter	Other Pollutants (SDI.4)
Unit	Noise level
Description	Project Introduction File and Noise Measurement Report ¹⁵ which was submitted during the validation phase of the project concludes that the noise values are below the permitted limits. In addition to this, no complaints related with the noise impact of the turbines have been received from the villagers.
Measured/calculated/default	On site measuring
Source of data	Project Introduction File, Noise Measurement Report and interviews with local community and Mukhtar
Value(s) of monitored parameter	N/A
Monitoring equipment	N/A
Measuring/reading/recording frequency	Once for each year of operation
Calculation method (if applicable)	N/A
QA/QC procedures	N/A
Purpose of data/parameter	Sustainability monitoring parameters

¹⁴ For the second monitoring period the invoice dated as 17/07/2016 is available to the DOE.

¹⁵ Noise measurement report is available to the DOE.

Additional comments

The octave sound power levels of the turbines on basis of measurements, aerodynamical calculations and expected sound power levels are seen as below. These values reflect the laboratory measurements¹⁶.

	Octave sound power levels at standardized wind speeds v_s in dB(A)									
Frequency	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s
63 Hz	77.6	81.6	84.6	86.6	87.6	88.1	88.6	88.6	88.6	88.6
125 Hz	82.7	86.7	89.7	91.7	92.7	93.2	93.7	93.7	93.7	93.7
250 Hz	86.6	90.6	93.6	95.6	96.6	97.1	97.6	97.6	97.6	97.6
500 Hz	86.9	90.9	93.9	95.9	96.9	97.4	97.9	97.9	97.9	97.9
1000 Hz	83.8	87.8	90.8	92.8	93.8	94.3	94.8	94.8	94.8	94.8
2000 Hz	84.0	88.0	91.0	93.0	94.0	94.5	95.0	95.0	95.0	95.0
4000 Hz	78.4	82.4	85.4	87.4	88.4	88.9	89.4	89.4	89.4	89.4
8000 Hz	69.3	73.3	76.3	78.3	79.3	79.8	80.3	80.3	80.3	80.3

Additionally, the Noise Measurement Report shows the measurements from 100m away from the turbines. These values change between 55.8-69.2 db(A). The regulation permits the values up to 70 db(A). However, the nearest village is 1 km away from the project activity.

In case of any complaint, local people can report their complaints via telephone and Mukhtar or come directly to the plant. No complaints related with the noise impact of the turbines have been received from the villagers.

During the verification site visit, interviews with local community have been done and no complaint was expressed.

Data/Parameter	Quality of Employment (SDI.7)
Unit	N/A
Description	Quality of employment is monitored through the job-related trainings and certificates given to the personnel. Main trainings in the reporting period were about Health&Safety, Climbing a Wind Turbine, Operation of the Lift.
Measured/calculated/default	N/A
Source of data	Certificates
Value(s) of monitored parameter	Five types of trainings have been provided to the employees. ¹⁷
Monitoring equipment	N/A
Measuring/reading/recording frequency	Once for each year of operation
Calculation method (if applicable)	N/A
QA/QC procedures	N/A
Purpose of data/parameter	Sustainability monitoring parameters

¹⁶ The turbine specs and Noise Measurement Report are available to the DOE.

¹⁷ The training certificates are available to the DOE.

Additional comments	The details of the trainings are as below:			
	Participant	Company	Training	Date
	Ersun Silak	Boreas	Work Permit Under High Voltage	2015
	Esin Ertaş	Boreas	Work Permit Under High Voltage	11.05.2015
	Hakan Kaya	Boreas	Work Permit Under High Voltage	11.05.2015
	Nihat Çapın	Boreas	Work Permit Under High Voltage	09.09.2013
	Ersun Silak	Boreas	Climbing a Wind Turbine	05.01.2015
	Tarık Meriç	Nordex	Climbing a Wind Turbine	05.01.2015
	Tarık Meriç	Nordex	Climbing a Wind Turbine	04.01.2016
	Tarık Meriç	Nordex	Climbing a Wind Turbine	02.01.2017
	Tarık Meriç	Nordex	Climbing a Wind Turbine	29.12.2017
	Esin Ertaş	Boreas	Climbing a Wind Turbine	29.01.2017
	Hakan Kaya	Boreas	Climbing a Wind Turbine	01-02.06.2017
	Ersun Silak	Boreas	Climbing a Wind Turbine	29.12.2017
	Nihat Çapın	Boreas	Climbing a Wind Turbine	01-02.06.2017
	Tarık Meriç	Nordex	Climbing a Wind Turbine	28.12.2018
	Aydın Öztürk	Nordex	Climbing a Wind Turbine	28-29.06.2018
	Esin Ertaş	Boreas	First Aid	29-30.05.2017
	Hakan Kaya	Boreas	First Aid	29-30.05.2017
	Çağlar Değirmendereli	Boreas	First Aid	29-30.05.2017
	Ersun Silak	Boreas	First Aid	29-30.05.2017
	Nihat Çapın	Boreas	First Aid	29-30.05.2017
	Orhan Başaran	Boreas	First Aid	29-30.05.2017
	Orhan Başaran	Boreas	Hygiene Training	14.07.2017
	Ersun Silak	Boreas	Hygiene Training	14.07.2017
	Ersun Silak	Boreas	Operation of the Lift	16.05.2018
	Nihat Çapın	Boreas	Operation of the Lift	20.05.2018
	Esin Ertaş	Boreas	Operation of the Lift	19.05.2018
	Hakan Kaya	Boreas	Operation of the Lift	22.05.2018
	Page 15 of 20			

Data/Parameter	Livelihood of the Poor (SDI 8&9)
Unit	N/A
Description	Contribution made to the poorest families and contribution made to improve the daily life of villagers. Mukhtar and local community members confirm the contributions. The donation of basketball equipment to the village school was realized and a student was granted.
Measured/calculated/default	N/A
Source of data	The invoice of the basketball hoop and the document from the school are the proofs for the donation of basketball equipment. Regarding the grant, the receipts are available to the DOE.
Value(s) of monitored parameter	N/A
Monitoring equipment	N/A
Measuring/reading/recording frequency	Annually
Calculation method (if applicable)	N/A
QA/QC procedures	
Purpose of data/parameter	Sustainability monitoring parameters
Additional comments	Mukhtar and local community members and the Consultant confirm the contributions.

Data/Parameter	Human and Institutional Capacity (SDI.11)
Unit	N/A
Description	The donation of basketball equipment to the village school was realized regarding the contributions done for educational and sportive activities.
Measured/calculated/default	N/A
Source of data	The invoice of the basketball hoop and the document from the school
Value(s) of monitored parameter	N/A
Monitoring equipment	N/A
Measuring/reading/recording frequency	During the implementation of the project
Calculation method (if applicable)	N/A
QA/QC procedures	N/A
Purpose of data/parameter	Sustainability monitoring parameters
Additional comments	The donation documents are available to the DOE.

Data/Parameter	Quantitative Employment and Income Generation
Unit	N/A

Description	Temporary jobs were created for local employees during construction. In total, 14 personnel are working for Boreas: • 2 technicians work for Nordex, • 5 electrical technicians, 1 administrative officer, 1 cook (7 personnel in total) from local community working permanently in the wind farm, • 5 security guards
Measured/calculated/default	N/A
Source of data	Social Security System records ¹⁸
Value(s) of monitored parameter	14
Monitoring equipment	N/A
Measuring/reading/recording frequency	At the end of the construction phase and each year of operation
Calculation method (if applicable)	N/A
QA/QC procedures	N/A
Purpose of data/parameter	Sustainability monitoring parameters
Additional comments	

D.3. Implementation of sampling plan

N/A

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

The baseline emission BE_y (tCO₂e) during the monitoring period results from:

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

Where:

BE_y	Baseline emissions in year y (tCO ₂ e/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 tCO₂/MWh for the crediting period of seven years.

¹⁸ The records are available to the DOE.

Since the registered capacity of the project activity is different from the installed capacity due to design change, the baseline emissions and thus emissions reductions will be based on the 'adjusted net electricity supplied to the grid'. This value will be calculated as below:

Adjusted net electricity supplied to the grid = $EG_{PJ,y} - (EG_{PJ,y} \times \text{Expected Generation of Added Capacity} / \text{Expected Generation after Capacity Increase})^{19}$

Table 4 shows the baseline emissions for the verification period:

Table 4- Baseline Emissions

Month	(A) Electricity supplied to the grid [MWh]	(B) Electricity consumption from the grid [MWh]	(C) = (A) - (B) EG (ID 8) Net electricity supplied to the grid [MWh]	EF [tCO ₂ /MWh]	Baseline emission: ER = EG * EF [t CO ₂ -eq]	(D) Adjusted electricity supplied to the grid [MWh]	Adjusted net electricity supplied to the grid [MWh] (E) = (D) - (B)	Adjusted baseline emission: ER = EG * EF [t CO ₂ -eq]
Nov '15 (12.11-30.11.2015)	3.288,01	4,41	3.283,59	0,613	2.013	2.784	2.780	1.704,1
Dec-15	5.824,52	12,83	5.811,69	0,613	3.563	4.932	4.919	3.015,7
Jan-16	6.117,96	6,69	6.111,27	0,613	3.746	5.181	5.174	3.172
Feb-16	5.831,27	9,20	5.822,08	0,613	3.569	4.938	4.929	3.021
Mar-16	6.557,60	6,14	6.551,46	0,613	4.016	5.553	5.547	3.400
Apr-16	4.086,53	9,96	4.076,57	0,613	2.499	3.461	3.451	2.115
May-16	4.505,43	7,34	4.498,09	0,613	2.757	3.815	3.808	2.334
Jun-16	5.229,07	7,69	5.221,38	0,613	3.201	4.428	4.420	2.710
Jul-16	5.590,95	5,58	5.585,38	0,613	3.424	4.735	4.729	2.899
Aug-16	9.059,22	2,15	9.057,07	0,613	5.552	5.938	5.936	3.639
Sep-16	6.792,42	4,00	6.788,41	0,613	4.161	4.452	4.448	2.727
Oct-16	6.106,71	6,61	6.100,10	0,613	3.739	4.003	3.996	2.450
Nov-16	7.680,42	8,67	7.671,74	0,613	4.703	5.034	5.025	3.081
Dec-16	8.110,51	12,01	8.098,49	0,613	4.964	5.316	5.304	3.251
Jan-17	9.261,24	5,90	9.255,34	0,613	5.674	6.070	6.064	3.717
Feb-17	7.671,94	6,72	7.665,22	0,613	4.699	5.029	5.022	3.078
Mar-17	7.452,55	7,72	7.444,82	0,613	4.564	4.885	4.877	2.990
Apr-17	4.230,91	12,86	4.218,06	0,613	2.586	2.773	2.760	1.692
May-17	6.025,37	7,77	6.017,60	0,613	3.689	3.949	3.942	2.416
Jun-17	2.979,15	15,04	2.964,11	0,613	1.817	1.953	1.938	1.188
Jul-17	6.402,33	11,30	6.391,04	0,613	3.918	4.196	4.185	2.565
Aug-17	9.870,67	1,43	9.869,25	0,613	6.050	6.470	6.468	3.965
Sep-17	4.794,81	11,89	4.782,92	0,613	2.932	3.143	3.131	1.919
Oct-17	4.736,02	16,43	4.719,59	0,613	2.893	3.104	3.088	1.893
Nov-17	5.039,04	10,60	5.028,44	0,613	3.082	3.303	3.292	2.018
Dec-17	10.112,97	2,45	10.110,52	0,613	6.198	6.629	6.626	4.062
Jan-18	7.753,25	6,23	7.747,02	0,613	4.749	5.082	5.076	3.111
Feb-18	8.670,98	4,67	8.666,30	0,613	5.312	5.683	5.679	3.481
Mar-18	8.254,90	4,10	8.250,80	0,613	5.058	5.411	5.407	3.314
Apr'18 (01.04-24.04.2018)	4.245,57	11,85	4.233,72	0,613	2.595	2.783	2.771	1.699
2015 Vintage (12.11.2015-31.12.2015)	9.112,53	17,24	9.095,28	1,23	5.575	7.716,68	7.699,44	4.720
2016 Vintage (01.01.2016-31.12.2016)	75.668,07	86,03	75.582,04	7,36	46.331	56.853,23	56.767,19	34.798
2017 Vintage (01.01.2017-31.12.2017)	78.576,99	110,10	78.466,89	7,36	48.100	51.503,32	51.393,23	31.504
2018 Vintage (01.01.2018-24.04.2018)	28.924,70	26,85	28.897,84	2,45	17.714	18.958,71	18.931,85	11.605
Total	192.282,29	240,23	192.042,06	18,39	117.720	135.032	134.792	82.627

E.2. Calculation of project emissions or actual net removals

Project emissions are taken as zero as per the methodology.

¹⁹ The calculation can be seen in more detail via the calculation spreadsheet which is available to the DOE.

E.3. Calculation of leakage emissions

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. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	82,627	0	0	0	82,627	82,627

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante (t CO ₂ e)
82,627	79,186

E.6. Remarks on increase in achieved emission reductions

Actual emission reduction in the second monitoring period is slightly higher (3,441 tCO₂e) than the ex-ante value estimated in the registered PDD. The amount causing difference can be explained as the increase of %4.3 than the expected generation of the project activity. However, this ratio is below the values used for sensitivity analysis submitted in the registered PDD. The vintage wise and total comparison may be seen in Table 4:

Table 4- Comparison of Emission Reductions

Year	Amount achieved during this monitoring period (tCO ₂ e)	Amount estimated ex ante (t CO ₂ e)
2015 (12.11.2015-31.12.2015)	4,720	4,429
2016 (01.01.2016-31.01.2016)	34,798	32,330
2017 (01.01.2017-31.12.2017)	31,504	32,330
2018 (01.01.2018-24.04.2018)	11,605	10,098
Total	82,627	79,186

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
06,0	7 June 2017	Revision to: • Ensure consistency with version 01,0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements,
05,1	4 May 2015	Editorial revision to correct version numbering,
05,0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement,
04,0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04,0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A,6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement,
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,
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