



**Verified Carbon
Standard**

MONITORING REPORT TITLE

Document Prepared by Gaia Finansal Danışmanlık Hizmetleri Tic. Ltd. Şti.

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project of ZT Enerji Elektrik Üretim San. Ve Tic. A.Ş. (hereafter referred to as “ZT Enerji”), Çerçikaya Wind Power Project (hereafter referred to as the “Project” or “Çerçikaya WPP”), involves installation and operation of 57 MWe / 57MWm¹ wind power plant by Energy Market Regulatory Authority (EMRA) and this licence was issued on 1st of March 2012 and it has been revised on 17th of June 2015.

The aim of the project is to generate electricity by the efficient utilization of the available wind energy by project activity replace the grid electricity, which is constituted of different fuel sources, mainly fossil fuels. The electricity produced by project activity result in emission reduction. Thus, the project has a significant contribution to climate protection and to sustainable development in the region.

The project activity contributed further dissemination of wind energy and extension of national power generation.

The construction of the project started on 18/06/2014² and operation of the plant started on 10/01/2015³ and have an operational life of 49 years. The main 1st phased implementation of the 10 wind turbines was on 10/01/2015, 2nd phased implementation of the 5 wind turbines was on 19/02/2015. The 3rd and last phased implementation of the 4 wind turbines was on 20/03/2015⁴.

First crediting period was started on 10/01/2015. End date of the first monitoring period is on 31/12/2019. Total emission reduction achieved during this monitoring period is 527,040 tCO₂e (for 10/01/2015- 31/12/2019). Generated net electricity during this monitoring period is 955,825.93MWh. Please see the vintage-based comparison of expected and achieved emission reductions for this monitoring period:

¹ The temporary acceptance protocol for 19 turbines, dated on 24/06/2016

² Site delivery protocol has been submitted to the DOE.

³ The first temporary acceptance protocol signed by the Ministry of Energy and Natural Resources has been submitted to the DOE.

⁴ The temporary acceptance protocols signed by the Ministry of Energy and Natural Resources have been submitted to the DOE.

Vintage	Total Days	Expected amount of net GHG removals (t CO ₂ e)	Amount achieved during this monitoring period (tCO ₂ e)	Expected net electricity generation (MWh)	Amount achieved during this monitoring period (MWh)	Difference (%)
10/01/2015-31/12/2015	356	98,971	81,815	179,479.59	148,378.46	-17.3%
01/01/2016-31/12/2016	365	101,473	111,559	184,017.00	202,320.99	9.9%
01/01/2017-31/12/2017	365	101,473	102,957	184,017.00	186,719.28	1.5%
01/01/2018-31/12/2018	365	101,473	117,551	184,017.00	213,187.20	15.9%
01/01/2019-31/12/2019	365	101,473	113,158	184,017.00	205,200.01	11.5%
Total	1,816	504,863	527,040	915,547.59	955,825.93	4.4%

Table 1: Ex-ante vs achieved emission reductions

Considering the difference between the amount achieved in this monitoring period and the ex-ante amount, higher (4.4%) than expected amount resulted in higher production. This difference may occur due to the more wind than expected.

Project has 19 turbines (Acciona AW125) with 3 MW capacity each. The key parameters about the technical design of the selected model Acciona AW125 are listed below in table.

Specifications	Acciona AW 125
Rated Power (kW)	3000
Rotor Diameter (m)	125
Num. of Blades	3
Swept Area (m ²)	12,305
Hub Height	87.5 m
Tower Type	Tubular Steel
Wind Speed	cut-in : 3 m/s cut-out: 25 m/s

Table 2: Technical specifications of Acciona AW 125 Turbines⁵
⁵ See, Technical Specifications of turbines, page 2

1.2 Sectoral Scope and Project Type

The respective sectoral scope is scope 1: “Energy Industry – Renewable/Non-renewable Sources”. Installed capacity of the project is 57 MWe, thus it falls into a large-scale project activity.

The project is not a grouped project.

1.3 Project Proponent

ZT Enerji is the developer and owner of the Project.

Organization name	ZT Enerji Elektrik Üretim San. Ve Tic. A.Ş.
Contact person	Erhan Kalender
Title	Energy Engineer
Address	Hatır Sokak No:22 Gaziosmanpaşa / Ankara
Telephone	90 312 447 00 70
Email	ekalender@zaf.com.tr

1.4 Other Entities Involved in the Project

The following table shows the project Developer and the Carbon Asset Development Consultants' contact information:

Organization name	Gaia Finansal Danışmanlık Hizmetleri Tic. Ltd. Şti
Role in the Project	Project Manager
Contact person	Gamze Karaca
Title	Carbon Consultant
Address	Maslak Meydan Sk. No:1 Beybi Giz Plaza Kat:26 Maslak/Istanbul
Telephone	+90212 2240450
Email	gkaraca@gaiacclimate.com

1.5 Project Start Date

The project start date is 10/01/2015 which is the commissioning date of the project.

1.6 Project Crediting Period

A two times renewable crediting period of 10 years 0 month shall apply. First verifiable emission reductions achieved on 10th of January 2015. Thus, the first crediting period shall last from 10th of January 2015 until 9th of January 2025.

This monitoring period is covering its first crediting period. (10/01/2015-31/12/2019)

1.7 Project Location

The host country is Turkey. Project area is in Mediterranean region, Hatay province. The project is located in İskenderun District. Moreover, the site of the project is located at Çerçikaya Village and will be situated on several hills, between Karayol, Bozburun, Kırmızıtepe.

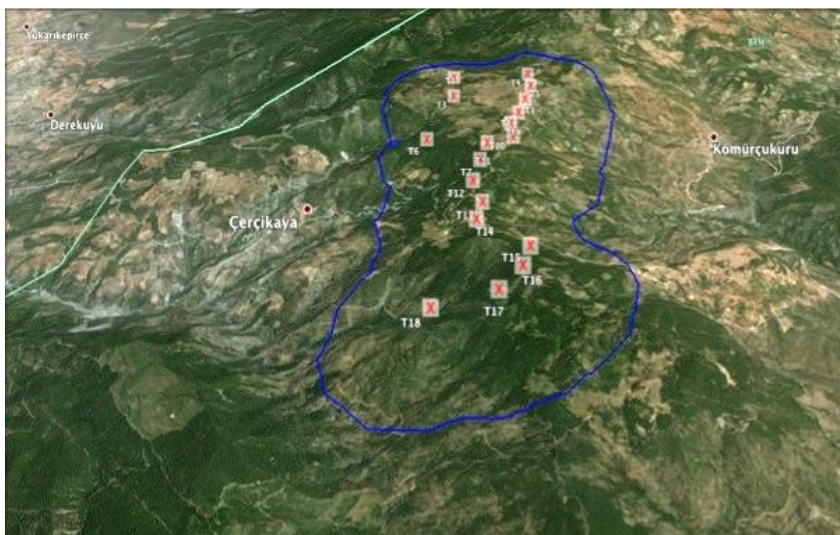


Figure 1: Location of Çerçikaya Wind Power Plant Project⁶

Turbine No.	Latitude (N)	Longitude (E)
1	36° 26' 23,5860"	48° 07' 28,1688"
2	36° 26' 18,9024"	48° 07' 23,0410"
3	36° 26' 07,9332"	48° 07' 16,0202"
4	36° 26' 07,7604"	48° 07' 08,9985"
5	36° 26' 02,2020"	48° 07' 01,9771"
6	36° 25' 55,6032"	48° 06' 58,6883"
7	36° 25' 49,4184"	48° 06' 57,8734"
8	36° 25' 43,3560"	48° 06' 56,6927"

⁶ Registered PDD, page 10

9	36° 25' 37,3440"	48° 06' 54,9882"
10	36° 25' 31,2888"	48° 06' 52,6833"
11	36° 25' 25,8816"	48° 06' 49,1100"
12	36° 25' 20,5680"	48° 06' 45,4530"
13	36° 25' 10,7220"	48° 06' 42,1247"
14	36° 24' 58,4784"	48° 06' 44,2644"
15	36° 24' 47,5308"	48° 06' 44,9109"
16	36° 24' 35,9424"	48° 06' 58,1839"
17	36° 24' 26,8920"	48° 07' 02,2513"
18	36° 24' 19,2276"	48° 07' 04,5014"
19	36° 24' 10,9404"	48° 07' 07,9381"

Table 3: Geographical coordinates of the wind turbines of the project activity⁷

1.8 Title and Reference of Methodology

For the determination of the baseline, the official methodology ACM0002 version 17.0.0, "Large-scale Grid-connected electricity generation from renewable sources", is applied, using conservative options and data as presented in the following section. This methodology refers to five Tools, which are:

- Tool to calculate the emission factor for an electricity system (Version 05.0.0)⁸;
- Tool for the demonstration and assessment of additionality (Version 07.0.0)⁹;
- Combined tool to identify the baseline scenario and demonstrate additionality (Version 06.0.0)¹⁰;
- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion (Version 02.0.0)¹¹.
- Tool to determine the remaining lifetime of the equipment¹²

⁷ See, Validation Report, page 8

⁸ See; <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf>

⁹ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

¹⁰ See; <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v6.0.pdf>

¹¹ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>

¹² See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf>

For baseline calculation the first tool, for additionality assessment the second tool is used. As third tool is the combination of the first and second tool, it is not used. Since no project emission or leakage calculation is required for wind power project fourth tool is not used, and finally to determine the remaining lifetime of the equipment fifth tool is used.

1.9 Participation under other GHG Programs

The project has not been registered or seeking registration under other GHG programs.

1.10 Other Forms of Credit

The project has not created another form of Credit.

1.11 Sustainable Development

The project helps Turkey to stimulate and commercialise the use of grid-connected renewable energy technologies and markets. Furthermore, the project demonstrates the viability of grid-connected wind farms which can support improved energy security, improved air quality, alternative sustainable energy futures, improved local livelihoods and sustainable renewable energy industry development. The specific goals of the project are to:

SDG-7 Clean and Affordable Energy

The project contributes to the Sustainable Development Goal, Affordable and Clean Energy. During this monitoring period, the actualized net electricity generation is 955,825.93 MWh.

SDG-8 Decent Work and Economic Growth

The project contributes to the Sustainable Development Goal, Decent Work and Economic Growth. Employment opportunities were provided for 17 personnel during the operation phase of the project.¹³

SDG-13 Climate Action

The project contributes to the Sustainable Development Goal, Climate Action. During this monitoring period, the actualized emission reduction is 527,040 tCO₂e.

¹³ The social security records of employees have been submitted to the DOE.

2 SAFEGUARDS

2.1 No Net Harm

Being a wind power generation project, there are no negative environmental and/or socio-economic impacts due to the project. The project purpose is supplying electricity generation to the Turkish National Grid by generating electricity from renewable sources and it does not have any adverse impact on water quality and quantity. Domestic wastewater has been collected and disposed to the sewage system via trucks. All generated waste has been handled according to the national legislations. Besides that, the project creates new job opportunities for the local community and supports the regional economy through the employment. The project area is the public land of General Directorate of Forestry. The process were complied related laws and regulations. Also, in line with Turkish environmental regulations, an “Environmental Impact Assessment (EIA) Not Required Letter” was approved by the Ministry of Environment and Forestry in 27/01/2014¹⁴.

2.2 Local Stakeholder Consultation

During the registration of this project, Local Stakeholder Consultation meeting was held on 06/12/2013 in Çerçikaya Village of Belen District. The purpose of the meeting was to inform public and stakeholders about the plan and present and discuss social and environmental impacts of the project. Invitation process for local stakeholder meeting was followed and about 20 associations/governmental offices were invited by invitation letters or calling. Apart from this kind of invitation other stakeholders were invited by local announcements such as announcement done on village coffeeshouse and in newspaper. All possible stakeholders were tried to be contacted via different kinds of communication ways such as sending letters to the invitees and local announcements. After sending letters to stakeholder, telephone calls were done to confirm receipt of invitation letters. Although all invitees respond positively to the project, many of them did not attend to the stakeholder meeting. During the meeting, representative of local governmental institutions and villagers expressed their support for renewable energy project of Çerçikaya WPP. In addition, during the meeting, it was explained to the participants that there will be a complaint and request form (comment book) is available at Çerçikaya WPP site and Project Participant check the comments in the book on a regular basis, and record responses. During this monitoring period; a site visit including the stakeholder engagement procedure was conducted at the Çerçikaya village with the Çerçikaya Village head (mukhtar) and the local stakeholders on 10/01/2020. The mukhtar of Çerçikaya invited a phone call to the meeting and it is requested from the Mukhtar to inform villagers about the meeting. Eleven person including Çerçikaya Village mukhtar, three Çerçikaya WPP employees and seven local stakeholders were interviewed. All of these people are from either Çerçikaya village or local villages around the plant. There were not

¹⁴ Please see official letter on the “EIA not required” decision.

any negative feedbacks from the locals. Locals stated that they are happy with the project since Çerçikaya WPP provided employment opportunities for local people¹⁵. Although there were no negative feedbacks, at the stakeholder engagement meeting, locals asked whether additional turbines will be constructed in the future. Project Manager stated that no additional turbine will be constructed closer to the Çerçikaya village for now. Since there were no negative feedbacks from the locals, there is no need to take any further action.

Also, mukhtar (head of the village) of Çerçikaya village had already taken the contact information of Plant Manager of the company so that the local stakeholders will be able to reach Plant Manager whenever they have any complaints, suggestions or ideas about the project.¹⁶ Since mukhtar is the head of the village, he will be the main contact person between the project owner and the local stakeholders. Mukhtar will make sure that there's continuous communication between the two parties. Also, Project Participant check comments in the book in detail. During this monitoring period no grievances were raised.

2.3 AFOLU-Specific Safeguards

N/A

3 Implementation Status

3.1 Implementation Status of the Project Activity

Çerçikaya WPP started to generate and provide electricity to the Turkish National Grid on 10/01/2015.

During the monitoring period, there was no event or situation that occurred, which may impact the applicability of the methodology. Registration of Cercikaya WPP was carried out by Life İklim ve Enerji Ltd. Şti.. However, for the verification processes, Carbon Consultant of the project has changed as GAIA Finansal Danışmanlık Hizmetleri Tic. Ltd. Şti.

Milestone	Date
Agreement with Carbon consultant	05/12/2013
Turbine foundation agreement	01/11/2013
Turbine agreement	10/12/2013
EIA Not Required Certificate for 19 turbines	24/01/2014
Bankable Energy Yield Assessment Report for Çerçikaya WPP	06/03/2014
Loan agreement with the bank	13/08/2014
The date for start of construction (Field delivery record)	18/06/2014

¹⁵ Social security records of the current employees are provided to DOE.

¹⁶ The signed and sealed letter by the Village Head (Mukhtar) confirming the communication details of PP responsible staff has been provided to DOE.

Provisional Acceptance Date of Turbines (T7, T8, T9, T10, T11, T12, T16, T17, T18, T19)	10/01/2015
Provisional Acceptance Date of Turbines (T2, T3, T13, T14, T15)	19/02/2015
Provisional Acceptance Date of Turbines (T1, T4, T5, T6)	20/03/2015
1 st Monitoring Period	10/01/2015-31/12/2019

Table 4: Project Timeline

3.2 Deviations

3.2.1 Methodology Deviations

No deviation in the methodology has been applied to the project activity during the monitoring period.

3.2.2 Project Description Deviations

There is no projects description deviation applied during the monitoring period. The registration of the Cercikaya WPP was carried out by Life İklim ve Enerji Ltd. Şti.. However, for the verification processes, Carbon Consultant of the project has changed as GAIA Finansal Danışmanlık Hizmetleri Tic. Ltd. Şti.

3.3 Grouped Projects

N/A.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	Gross electricity generation
Data unit	MWh
Description	Gross Electricity supplied to the grid by relevant sources (2013-2015)
Source of data	Turkish Electricity Transmission Company (TEİAŞ), Annual Development of Turkey's Gross Electricity Generation of Primary Energy Resources (2013-2015) TEİAŞ http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2015/istatistik2015.htm , ,table 55
Value applied	See Validated VCS-PD, Table 13

Justification of choice of data or description of measurement methods and procedures applied	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	EF _{grid, CM, y}
Data unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the project electricity system in year 2015
Source of data	As per "Tool to calculate the emission factor for an electricity system"
Value applied	0.5514 tCO ₂ /MWh
Justification of choice of data or description of measurement methods and procedures applied	As per "Tool to calculate the emission factor for an electricity system" Calculated from data provided by the TEIAS for Turkish Power Sector; Operating Margin = 0.6276 KgCO ₂ e/KWh Build Margin = 0.3230 KgCO ₂ e/KWh Combined Margin = 0.5514 KgCO ₂ /KWh
Purpose of Data	Emission Factor is fixed at ex-ante calculation.
Comments	-

Data / Parameter	Eg _{facility,y}
Data unit	MWh/yr
Description	Quantity of net electricity generation by the project plant in a year
Source of data	Turkish Electricity Transmission Company (TEIAS), Annual Development of Electricity Generation- Consumption and Losses in Turkey TEIAS, see http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2015/istatistik2015.htm (excel file number 52, 55 are

	used for the calculation of the net electricity generated by relevant sources)
Value applied	See Validated VCS-PD, Table 14 and Table 15
Justification of choice of data or description of measurement methods and procedures applied	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey. This data is used to find relation between the gross and net electricity delivered to the grid by fossil fuel fired power plants. (See Table 14). Import and Export data is used to identify total net electricity fed into the grid in the years of 2013, 2014 and 2015 (See Table 15).
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	EF _{CO₂,i,y}
Data unit	tCO ₂ /GJ
Description	CO ₂ emission factor of fuel type i used in year y
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 IPCC Guidelines on National GHG Inventories. See http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value applied	See Validated VCS-PD, Table 18 and Table 21
Justification of choice of data or description of measurement methods and procedures applied	No plant specific and national emission factor data is available in Turkey. So, IPCC default data is used. For Fuel Oil Power Plants: 'Gas/Diesel Oil' data is used for conservativeness. For Coal Power Plants: In the 205 th page of official document given in the link below, it is stated that Çolakoğlu and İçdaş utilizes 'Taşkömürü' (Hardcoal). And at the Table-2 in page 157 of the same document, Taşkömürü is divided in two groups: Bituminous and Anthracite. Since Sub-Bituminous Coal is under Brown Coal in the same table and since Other Bituminous Coal has lower EF than Anthracite in 1.4 of IPCC Guidelines, EF for 'Other Bituminous Coal' is used. See: http://www.dpt.gov.tr/DocObjects/Icerik/4225/Enerji_Hammaddeleri_(Linyit_Taskomuru-Jeotermal)
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	Sample Group for BM emission factor
Data unit	Name of the plants, MW capacities, fuel types, annual electricity generations and dates of commissioning.
Description	Most recent power plants which compromise 20% of total generation
Source of data	Annual Development Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEIAS: http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2011.pdf http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2012.pdf http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2013.pdf
Value applied	See Validated VCS-PD, Table 23
Justification of choice of data or description of measurement methods and procedures applied	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey. The latest data available during PD preparation was for 2013.
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	$\eta_{m,y}$
Data unit	-
Description	Average energy conversion efficiency of power unit m in year y
Source of data	Annex I the "Tool to calculate the emission factor for an electricity system"
Value applied	See Validated VCS-PD, Table 18
Justification of choice of data or description of measurement methods and procedures applied	For efficiency rates of Coal and Lignite Power Plants See Annex-1 of the Tool (highest rate is applied to be conservative) For Natural Gas and Oil plants efficiencies, default value given in the tool is applied: http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_%20emission.pdf

Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	$HV_{i,y}$
Data unit	Mass or volume unit
Description	Heating Values of fuels consumed for electricity generation in the years of 2013, 2014 and 2015
Source of data	Heating Values Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2015/istatistik2015.htm excel file 69
Value applied	See Validated VCS-PD, Table 19
Justification of choice of data or description of measurement methods and procedures applied	There is no national NVC data in Turkey. However, TEİAŞ announces Heating values of fuels. This data is used to calculate annual NCVs for each fuel type. TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / Parameter	$FC_{i,y}$
Data unit	Mass or volume unit
Description	Amount of fuel type i consumed in the project electricity system in year y
Source of data	Annual Development of Fuels Consumed In Thermal Power Plants In Turkey by The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2015/istatistik2015.htm excel file 67
Value applied	See Validated VCS-PD, Table 20
Justification of choice of data or description of measurement methods and procedures applied	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of Data	Data used for emission reduction calculation

Comments	-
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Data / Parameter	NCV _{i,y}
Data unit	TJ/Gg
Description	Net Calorific Value of fuel types in the years of 2013, 2014 and 2015
Source of data	Calculated by using HVi,y to FCi,y as Net Calorific Values of fuel types are not directly available in Turkey.
Value applied	See Validated VCS-PD, Table 21
Justification of choice of data or description of measurement methods and procedures applied	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of Data	Data used for emission reduction calculation
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	EG _{facility,y}
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied to the grid in year y
Source of data	Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation
Description of measurement methods and procedures to be applied	The net electricity generation supplied to the grid is measured continuously by meters (both main and spare) and recorded monthly.
Frequency of monitoring/recording	Annually

Value monitored	955,825.93															
	Vintage	Electricity supplied to the grid (MWh)	Electricity consumption from the grid (MWh)	Net electricity supplied to the grid [MWh]												
	10/01/2015-31/12/2015	148,847.45	468.99	148,378.46												
	01/01/2016-31/12/2016	202,835.50	514.51	202,320.99												
	01/01/2017-31/12/2017	187,246.20	526.92	186,719.28												
	01/01/2018-31/12/2018	213,717.59	530.39	213,187.20												
	01/01/2019-31/12/2019	205,808.30	588.29	205,220.01												
	Total	958,455.03	2,629.09	955,825.93												
Monitoring equipment	Meters are in compliance with the communiqué for Metering Devices to be used in Electricity Market. The specification of electricity meters are provided below:															
	<table><tr><td>Name</td><td>Serial Number</td><td>Brand –Model</td><td>Date Of Last Calibration</td></tr><tr><td>Main Meter</td><td>4585848</td><td>EMH</td><td>17/10/2018</td></tr><tr><td>Backup meter</td><td>4585849</td><td>EMH</td><td>17/10/2018</td></tr></table>				Name	Serial Number	Brand –Model	Date Of Last Calibration	Main Meter	4585848	EMH	17/10/2018	Backup meter	4585849	EMH	17/10/2018
	Name	Serial Number	Brand –Model	Date Of Last Calibration												
Main Meter	4585848	EMH	17/10/2018													
Backup meter	4585849	EMH	17/10/2018													
During the monitoring period four metering tests were performed on 22/12/2015, 12/12/2016, 13/11/2017 and 17/10/ 2018 respectively. Also, the last metering test date is 11/07/2020. All calibration test results are provided to the DOE. Accuracy class: Active 0.2S – Reactive 2																
QA/QC procedures to be applied	Measurements are undertaken using energy meters.															
	According to the Article 2 of the Communiqué of Meters in Electricity Sector¹⁷: ‘The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained “Type and System Approval” certificate from the Ministry of Trade and Industry.’ Therefore, Ministry of Trade and Industry (Ministry) is responsible from control and calibration of the meters.															

¹⁷ http://www.epdk.gov.tr/documents/elektrik/mevzuat/teblig/elektrik/sayaclar_hakkinda/Elk_Tblg_Sayaclar.doc

	- Paragraph b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems' (Regulation) of Ministry states that: ' b) Periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done every 10 years.' Therefore; periodic calibration of the meters will be done every 10 years. - As above mentioned, the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. In addition to that the quantity of net electricity delivered to the grid will be cross checked with the meter reading records (OSF forms) provided to the company by TEİAŞ and internal reports provided to the head of the company by the plant manager. - The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Data from remote automatic meter reading system (OSOS) is used for crosschecking. Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation.
Purpose of the data	Calculation of emission reductions
Calculation method	The net electricity is calculated by: a) Subtracting self consumption value from gross generation value for each month to find the net electricity supplied to the grid. b) Adding up all monthly net electricity values to calculate the total net electricity supplied to the grid during the monitoring period. c) Multiplying the total net electricity value with the CM emission factor.
Comments	

4.3 Monitoring Plan

As the necessary baseline emission factors are all defined ex ante (Operating and Built Margin, see baseline description), the most important information to be monitored is the amount of electricity fed into the grid by Çerçikaya WPP. This value will be monitored continuously by metering devices, one of them being the main one in the substation, which provides the data for the monthly invoicing to TEİAŞ.

The Project Owner will be responsible to implement the monitoring report according to the UNFCCC rules and procedures. According to the Turkish Law and Regulations, the methods

of monitoring the net electricity fed to the grid and quality control and assures are explained below:

Monitoring data is collected in accordance with the agreement done between the project owner and Turkish Electricity Transmission Company (TEİAŞ) which provides the infrastructure for the connection to the national grid. The metering system is defined in the agreement as two groups: main meter and spare meter. The design of the metering system is checked and approved by TEİAŞ before commissioning of the plant. The technical specifications of the power meters should be in line with Measure and Metering Devices Regulation by Ministry of Industry and Trade. In addition, the Communiqué for Power Meters announced by Energy Market Regulations Authority (EMRA) requires all meters to be in line with either Turkish Standards Institution or International Electro technical Commissions Standards. The meters are placed at the point the electricity is fed to the grid and sealed on behalf of the both parties. This prevents any intervention and assures the accuracy and quality of the measurements. Concerning metering system accuracy, project participants have to comply with relevant national legislation According to b) paragraph of the 9th Article of the Regulation of Metering and Testing of Metering Systems “periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformer are done every 10 years.

Data will be stored electronically, during the crediting period and at least two years after the last issuance of credits for the wind farm project activity in the concerning crediting period. The Project Proponent will be responsible for storage of data received from the measuring devices.

The main and spare meter readings are recorded monthly-remote automatic meter reading system and cross-checked whether calibration is required. The capacity of the transmission line connected is medium voltage of 154 kVA, the accuracy class for power meters have been defined in the Communiqué for Power Meters as 0.2S class. The calibration will be implemented in accordance with the related standard procedures. The periodical maintenance is under the responsibility of TEİAŞ and has been fixed as once in 10 years as mentioned above.

Operational and Management Structure

As described before, there are two main factors important for the calculation of emission reductions. The only relevant data that have to be monitored is only net electricity generation ($EG_{\text{facility},y}$) per year. Since project emission is zero no additional monitoring is required. The generation data are subject to the strict internal quality control systems of both parties.

The monthly meter reading documents are stored by ZT Enerji and TEİAŞ. The settlement notification, which is issued by TEİAŞ and includes the meter reading data, is stored on a TEİAŞ file server and accessible for ZT Enerji via a secured website. The meters themselves can always be read as plausibility check for verification. The other important parameter is the emission factor. It is approved according to strict quality control parameters from an independent external party. With this, no additional structures or processes have to be implemented to insure the availability and high quality of the necessary data for monitoring.

Project Manager is responsible for all issues related to project and operation of the plant. On the other hand, plant manager is responsible for daily operational processes of the plant, management of the plant personnel, and other technical and management issues for the plant. Operator technicians are responsible for monitoring of the plant and turbines for all day and night in the control room. They are responsible for recording data hourly and manage the turbines of the plant. Plant securities are responsible for monitoring the field from cameras for all day and night and they tour the plant site in every two hours. Lastly, kitchen service is responsible for managing the kitchen and providing meal for the plant personnel. Roles and responsibilities have been summarized in the following chart.

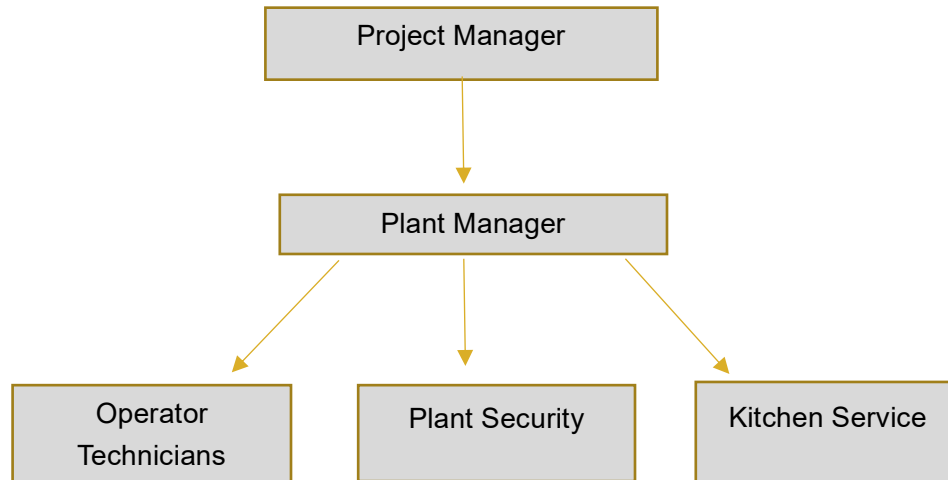


Figure 2: Operation and Management diagram

ZT Enerji will keep all the data needed for the calculation of emission reductions during the crediting period and until two years after the last issuance of VCS for Çerçikaya WPP.

Because of the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. Dedicated emergency procedures are not provided, as there is no possibility of overstating emission reductions due to emergency cases.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The total emission reductions can be calculated with the results of the below described equations. The emission reduction is equal to the baseline emissions minus project emissions and leakage emissions. Leakage emissions in this project are considered to be

negligible. There are no project emissions in this kind of project. The general equation is as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂/yr).

BE_y = Baseline emissions in year y (t CO₂/yr).

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

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

y = Refers to a given period

The electricity meters are measuring two parameters: The electricity supplied to the grid (EG_{export}) and the electricity consumption from the grid (EG_{import}). To achieve the net amount of supplied electricity, the difference has to be calculated:

$$GEN_y = EG_{\text{export}} - EG_{\text{import}}$$

Where: GEN_y = Net electricity supplied to the Grid in MWh

EG_{export} = Electricity supplied to the Grid in MWh

EG_{import} = Electricity consumption from the Grid in MWh

According to the applied methodology version the emission reduction is the baseline emissions calculated as the net electricity supplied to the grid multiplied by the grid emission factor.

$$BE_y = GEN_y * EF$$

Where: BE_y = Baseline emissions in tonnes CO₂e

EF = Grid emission factor for the electricity displaced due to the project activity during the year y [tCO₂e/MWh]

GEN_y = Net electricity supplied to the Grid in MWh

y = Refers to a given period

5.2 Project Emissions

The proposed project activity involves the generation of electricity by development of a wind farm. The generation of electricity does not result in greenhouse gas emissions and therefore is taken as 0 tCO₂/year.

5.3 Leakage

LE_y is 0, as it is not considered according to ACM0002. PE_y is 0 because project is a wind power generation activity (Only for geothermal and Hydro project activities, it should be considered according to ACM0002).

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
10/01/2015	3,722	0	0	3,722
February 2015	7,162	0	0	7,162
March 2015	8,731	0	0	8,731
April 2015	7,687	0	0	7,687
May 2015	8,264	0	0	8,264
June 2015	8,477	0	0	8,477
July 2015	7,277	0	0	7,277
August 2015	7,780	0	0	7,780
September 2015	4,515	0	0	4,515
October 2015	3,142	0	0	3,142
November 2015	8,085	0	0	8,085
December 2015	6,974	0	0	6,974
Total 2015	81,8115	0	0	81,815
January 2016	6,246	0	0	6,246
February 2016	5,325	0	0	5,325
March 2016	9,935	0	0	9,935
April 2016	5,669	0	0	5,669

May 2016	8,414	0	0	8,414
June 2016	10,403	0	0	10,403
July 2016	15,486	0	0	15,486
August 2016	13,672	0	0	13,672
September 2016	11,116	0	0	11,116
October 2016	7,189	0	0	7,189
November 2016	11,273	0	0	11,273
December 2016	6,831	0	0	6,831
Total 2016	111,559	0	0	111,559
January 2017	8,610	0	0	8,610
February 2017	5,878	0	0	5,878
March 2017	7,336	0	0	7,336
April 2017	6,613	0	0	6,613
May 2017	8,081	0	0	8,081
June 2017	10,672	0	0	10,672
July 2017	13,707	0	0	13,707
August 2017	13,290	0	0	13,290
September 2017	6,896	0	0	6,896
October 2017	4,806	0	0	4,806
November 2017	7,603	0	0	7,603
December 2017	9,465	0	0	9,465

Total 2017	102,957	0	0	102,957
January 2018	8,900	0	0	8,900
February 2018	6,782	0	0	6,782
March 2018	7,713	0	0	7,713
April 2018	5,605	0	0	5,605
May 2018	6,379	0	0	6,379
June 2018	14,031	0	0	14,031
July 2018	17,553	0	0	17,553
August 2018	16,174	0	0	16,174
September 2018	9,636	0	0	9,636
October 2018	6,449	0	0	6,449
November 2018	9,721	0	0	9,721
December 2018	8,607	0	0	8,607
Total 2018	117,551	0	0	117,551
January 2019	9,637	0	0	9,637
February 2019	7,580	0	0	7,580
March 2019	6,218	0	0	6,218
April 2019	5,384	0	0	5,384
May 2019	7,998	0	0	7,998
June 2019	12,318	0	0	12,318
July 2019	15,056	0	0	15,056
August 2019	13,883	0	0	13,883

September 2019	9,831	0	0	9,831
October 2019	7,366	0	0	7,366
November 2019	9,639	0	0	9,639
December 2019	8,248	0	0	8,248
Total 2019	113,158	0	0	113,158
Total Sum	527,040	0	0	527,040

Table 4: Summary of Emission Reductions