SHANDONG WENDENG ZHANGJIACHAN WIND FARM PROJECT

Document Prepared By CGN Carbon Asset Management (Beijing) Co., Ltd.

Project Title	*Shandong Wendeng Zhangjiachan Wind Farm Project*
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Monitoring Period	*26/02/2011-29/02/2012*
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Shandong Wendeng Zhangjiachan Wind Farm Project (hereinafter referred to as the proposed project) is to utilize wind resources for electricity generation through the construction of a wind farm with a total capacity of 49.3MW in Wendeng City, Shandong Province, P. R. China. The electricity generated from the project will be sold to North China Power Grid (NCPG). The proposed project will achieve obvious greenhouse gas (GHG) emission reductions through the displacement of electricity delivered by NCPG which is a fossil-fuel dominated grid.

The proposed project is located in Wendeng City, Shandong Province, P. R. China. The proposed project involves the installation of 58 wind turbines with capacity of 850 kW each, which amount to a total installed capacity of 49.3MW. The proposed project is constructed and operated by Wendeng Zhangjiachan Wind Power Co., Ltd.. The estimated annual net electricity generation and average annual emission reductions of the proposed project are 90,997MWh and 84,709 tCO_2e, respectively.

The project started construction on 26/02/2010. The first batch of generating units started commercial operation on 26/02/2011.

The total emission reductions achieved in this monitoring period (26/02/2011-29/02/2012) were 63,369 tCO_2e.

1.2 Sectoral Scope and Project Type

Category: Renewable electricity in grid connected application

Sectroal Scope 1: Energy Industry

The project is not a grouped project.

1.3 Project Proponent

Organization name	Wendeng Zhangjiachan Wind Power Co., Ltd.
Contact person	Shi Lei
Title	CDM office director
Address	Area 12 of Advanced Business Park, No. 188 west of South 4th Ring Road, No.2 Building, Beijing, The People's Republic of China
Telephone	+86 10 63705765
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1.4 Other Entities Involved in the Project

There are no other entities involved.

1.5 Project Start Date

26/02/2011(commissioning start date)

1.6 Project Crediting Period

The project crediting period is from 26/02/2011 to 29/02/2012 and the total crediting period is 369 days.

1.7 Project Location

The proposed project is located at Wendeng City, Shandong Province, P. R. China. The geographical coordinates of the proposed project is from 122.051944 E to 122.155278 E, and from 37.093611 N to 37.181667 N. The central geographical coordinate of the proposed project is 122.103611 E, 37.137639 N. Figures A1 and A2 show the geographical location of the proposed project.

Figure A1. The location of the proposed project in the map of P. R. China

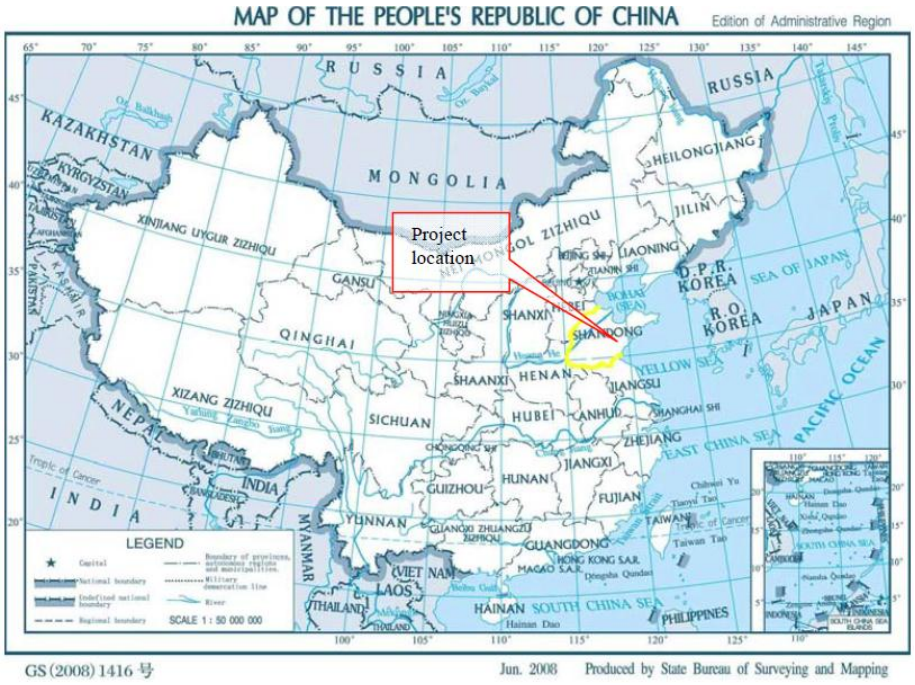


Figure A2. The proposed project on the map of Shandong Province and Wendeng County

1.8 Title and Reference of Methodology

The approved methodology applied in the proposed project activity is ACM0002 (version 12.2.0) – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

"Tool for the demonstration and assessment of additionality (version 05.2.1)" and

"Tool to calculate the emission factor for an electricity system (version 02.2.1)" is also applied in the proposed project.

Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/approved

1.9 Other Programs

The project has been registered as a CDM project on 17/01/2012 with Ref No.5655, for which a renewable crediting period of 3*7 years will be used under the CDM GHG Program. Therefore, CO_2 emission reductions generated by the project during the CDM crediting period will be verified as unique CERs, but not VCUs to avoid double counting. As to the project under VCS standard (Version. 3.4), only emission reduction achieved from 26/02/2011 to 29/02/2012 will be considered as VCUs.

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program for the period from 26/02/2011 to 29/02/2012.

The project has been registered as CDM project and the registration number is 5655, the CDM crediting period is form 01/03/2012 to 28/02/2019.

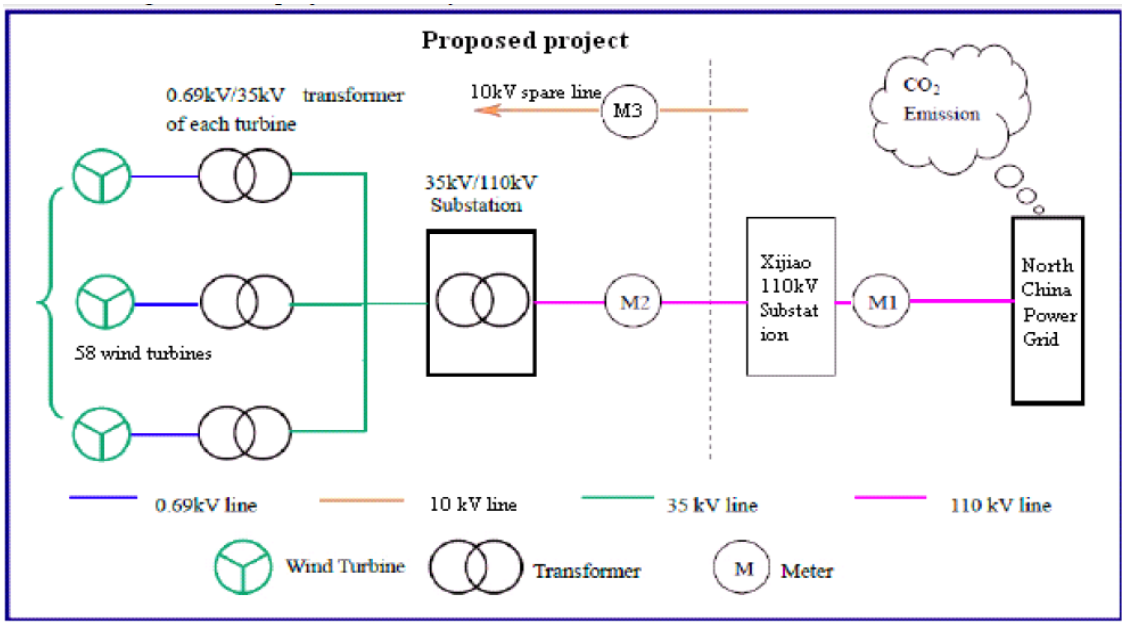
2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project employed standard wind power generation technology. It installed 58 wind turbines with capacity of 850kW each adding up to a total installed capacity of 49.3 MW. The main specifications of the turbine/generator are listed as below Table:

Wind Turbine (G58-850kW)		
Item	Unit	Index
Rated capacity	kW	850
Number of blades		3
Rotor diameter	m	58
Cut-in speed	m/s	3.0
Rated wind speed	m/s	16
Cut-off speed	m/s	23
Height of hub	m	65
Rated voltage	V	690

The technology diagram of the Project is as follows:



2.2 Deviations

2.2.1 Methodology Deviations

There is no methodology deviations applied during this monitoring period.

2.2.2 Project Description Deviations

There is no project description deviations applied during this monitoring period.

2.3 Grouped Project

The project is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/ MWh
Description	Combined margin emission factor for grid connected power generation in year y
Source of data	Registered CDM PDD with Ref No.5655
Value applied:	0.9309
Justification of choice of data or description of measurement methods and procedures applied	Refer to the registered CDM PDD with Ref No.5655
Purpose of the data	Calculation of baseline emissions
Comments	The data is calculated ex-ante according to the applied tool.

3.2 Data and Parameters Monitored

Data / Parameter	$EG_{Facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project to the Grid in year y.
Source of data	Calculation by $EG_{output,y}$, $EG_{import,y}$ and $EG_{im-spare,y}$
Description of measurement methods and procedures to be applied	Continuously measurement and monthly recording
Frequency of monitoring/recording	Calculated based on the measurement results of $EG_{output,y}$, $EG_{import,y}$ and $EG_{im-spare,y}$
Value monitored:	68,073.774

Monitoring equipment	Please refer to the monitoring equipment information in the table of parameters $EG_{output,y}$, $EG_{import,y}$ and $EG_{im\text{-}spare,y}$
QA/QC procedures to be applied	$EG_{output,y}$ and $EG_{import,y}$ will be monitored by the main meter at the connection point between the proposed project and the Grid. The project operator is responsible for recording such data. Cross check the meter reading with sales receipts. $EG_{im\text{-}spare,y}$ will be measured based on the amount on the sales receipts from the local power distributor.
Purpose of the data	Baseline Emission calculation
Calculation method	The net electricity supplied to the Grid by the proposed project will be calculated through electricity supplied by the project to the grid ($EG_{output,y}$) minus electricity purchased from the Grid ($EG_{import,y}$) and electricity purchased from the 10 kV spare line ($EG_{im\text{-}spare,y}$).
Comments	-

Data / Parameter	$EG_{output,y}$
Data unit	MWh
Description	Electricity supplied to the grid by the Project in year *y*.
Source of data	Electricity meter reading (M1 as main meter, M2 as backup meter)
Description of measurement methods and procedures to be applied	The data will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the last crediting period.
Frequency of monitoring/recording	Continuously measurement and monthly recording
Value monitored:	68,399.100
Monitoring equipment	Electricity meter reading (M1 as main meter, M2 as backup meter).

	Main meter M1	Backup meter M2
Meter Type	Bidirectional meter	
Accuracy	0.5S	0.2S
Calibration frequency	Annually	

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<tr><td>Serial No.</td><td>370110001005067</td><td>1007036777000001</td></tr>
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27/12/2011</td><td>30/12/2010
27/12/2011</td></tr>
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26/12/2012</td><td>29/12/2011
26/12/2012</td></tr>
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<tr><td>QA/QC procedures to be applied</td><td>The meter at the substation will be calibrated once a year according to the national standards. Electricity supplied to the grid will be double checked according to sales receipts.</td></tr>
<tr><td>Purpose of the data</td><td>Baseline Emission calculation</td></tr>
<tr><td>Calculation method</td><td>-</td></tr>
<tr><td>Comments</td><td>-</td></tr>
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<tr><td>Data / Parameter</td><td>$EG_{import,y}$</td></tr>
<tr><td>Data unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Electricity delivered to the project by the grid in year y.</td></tr>
<tr><td>Source of data</td><td>Electricity meter reading (M1 as main meter, M2 as backup meter)</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>The data will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the last crediting period.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measurement and monthly recording</td></tr>
<tr><td>Value monitored:</td><td>309.10</td></tr>
<tr><td>Monitoring equipment</td><td>Electricity meter reading (M1 as main meter, M2 as backup meter).
<table>
<tr><td></td><td>Main meter M1</td><td>Backup meter M2</td></tr>
<tr><td>Meter Type</td><td colspan="2">Bidirectional meter</td></tr>
<tr><td>Accuracy</td><td>0.5S</td><td>0.2S</td></tr>
<tr><td>Calibration frequency</td><td colspan="2">Annually</td></tr>
<tr><td>Serial No.</td><td>370110001005067</td><td>1007036777000001</td></tr>
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</table>

	Calibration done on	30/12/2010 27/12/2011	30/12/2010 27/12/2011
	Validity of Calibration	29/12/2011 26/12/2012	29/12/2011 26/12/2012
QA/QC procedures to be applied	The meter at the substation will be calibrated once a year according to the national standards. Electricity supplied to the grid will be double checked according to sales receipts.		
Purpose of the data	Baseline Emission calculation		
Calculation method	-		
Comments	-		

Data / Parameter	$EG_{im\text{-}spare,y}$
Data unit	MWh
Description	Electricity purchased from the gird through a 10 kV spare line in the year y
Source of data	Electricity meter reading (M3)
Description of measurement methods and procedures to be applied	The local power distributor will measure the $EG_{im\text{-}spare,y}$ by metering instrument owned, operated and installed at the project site. Only the local power distributor is accessible to the meter. Sales receipts will be issued accordingly in an approach which is agreed by both the local power distributor and the project owner.
Frequency of monitoring/recording	Continuously measurement and monthly recording
Value monitored:	16.226
Monitoring equipment	Electricity meter reading (M3) at the project site.

	Main meter M1
Accuracy	0.5S
Calibration frequency	Annually
Serial No.	WY4D98135
Calibration done on	30/12/2010

		27/12/2011
	Validity of Calibration	29/12/2011 26/12/2012
QA/QC procedures to be applied	The meter will be calibrated once a year according to the national standards. Reading recording, operation and maintenance of this meter was implemented by the local power distributor (the owner of the metering instrument).	
Purpose of the data	Baseline Emission calculation	
Calculation method	-	
Comments	-	

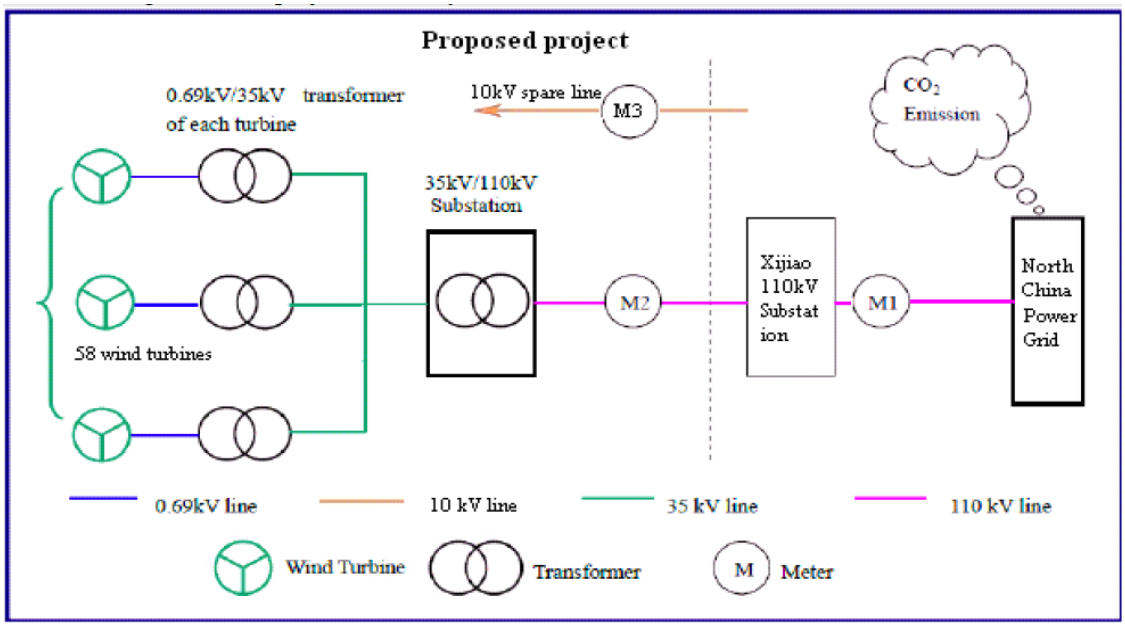
3.3 Monitoring Plan

The bi-directional electricity meter (M1) is installed on the substation to measure directly and continuously the electricity supplied to the grid by the project activity and the electricity purchased from the grid to the project site. The supplied and purchased electricity is double checked with the sales receipts.

The back-up meter (M2) is installed in the 110kV substation in the wind farm. The sales receipts of the electricity supplied to the grid by this proposed project and the electricity purchased from the grid are issued based on the power purchase agreement (PPA) signed between the project entity and the power grid company and the readings from the main meter (M1). The reading of meter (M2) is carried out by the project owner just for cross check against reading of M1, taken the line loss into consideration. The accuracy of M1 and M2 is no lower than 0.5s, and the calibration frequency of M1 and M2 is once a year in line with the national standards.

A 10kV spare line is used for supplied electricity to the proposed project when the main power line fails to supply power. A meter (hereafter referred as meter M3) is installed to measure the electricity imported via this line. This meter is owned, maintained and monitored by the local power distributor. The accuracy of the meter is not lower than 2.0, and the calibration frequency of the meter M3 is once a year in line with the national standards.

The simplified wiring diagram is showed as below:



$EG_{output,y}$ (the electricity supplied to the grid by the project activity) and $ED_{import,y}$ (the electricity delivered to the project activity by the grid via the main power line) is measured by both main bidirectional meter M1 and bidirectional back up meter M2 in accordance with national regulations. During this monitoring period (26/02/2011 to 29/02/2012), the 24:00 on the last but five of every month is determined as the settlement time for power supplied to the grid. The grid company issues the monthly Electricity Transaction Notes (ETNs) based on the readings of M1 to the project entity. The measurement results of $EG_{output,y}$ measured with main meter M1 and backup meter M2 and electricity supply values on ETNs are cross-checked against each other. The measurement results of M1 and the monthly ETNs are considered as a basis for emission reductions calculation. Measurement records and also ETNs are archived for a period of two years after the crediting period to which the records pertain.

$ED_{im\text{-}spare,y}$ (the electricity delivered to the project activity by the grid via the back-up power line) is measured by standard metering instrument M3 installed on the 10kv back-up power line in accordance with national regulations. The 24:00 on the last but 20 of every month is determined as the settlement time. The grid company issues ETNs (or statement issued by the grid company) according to the readings of M3 for power delivered to the project activity every month. The measurement results of M3 and electricity value on ETNs (or statement issued by the grid company) are cross-checked against each other and those values were considered as a basis for emission reductions calculation. Measurement records and also the ETNs are archived for a period of 2 years after the crediting period to which the records pertain.

Monitoring organizational structure, roles and responsibilities

The project owner will use this document as guideline in monitoring of the project emission reduction performance and will adhere to the guidelines set out in this monitoring plan to ensure that the monitoring is credible, transparent and conservative.

The responsibilities of the project staff are as follows:

General Manager: To be responsible for supervising the whole monitoring procedure.

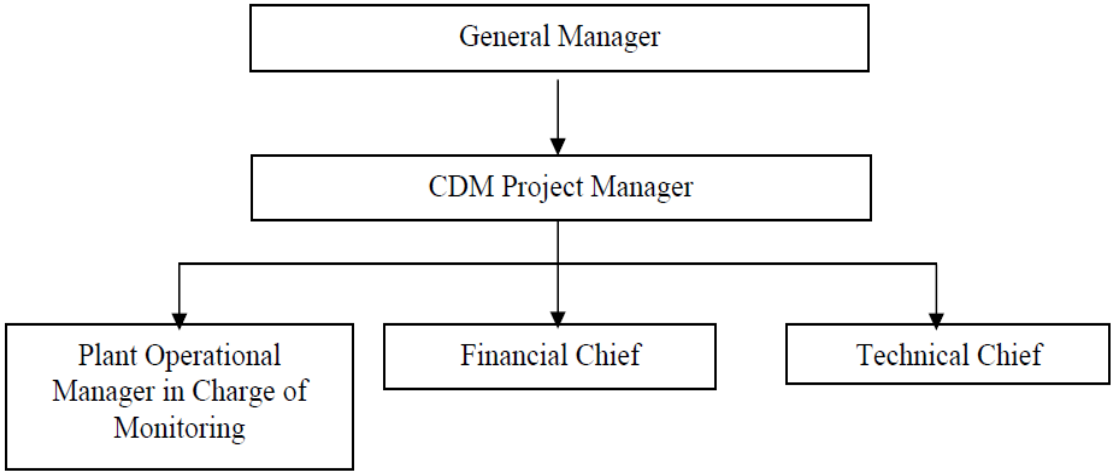
CDM Project Manager: To be responsible for data management and compiling monitoring report.

Operational and monitoring manager: To be responsible for collecting data and do internal audit.

Financial chief: To be responsible for collection of sales receipts.

Technical chief: To be responsible for preparing operational reports of the project activity, recording the daily operation of the wind farm, including operating periods, equipment defects, etc.

The organization of the monitoring implementers is illustrated in the table below:



Data Management System

To keep safely the record of the data collected during monitoring, this project will set up a complete data management system. The project will perfect the whole monitoring procedure by developing the CDM manual, tracking information from the primary source to the end-data calculations in paper document format. It is the responsibility of the proposed project owner to provide additional necessary data and information for validation and verification requirements of respective DOE. Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated in a central place, together with this monitoring plan. All paper-based information will be stored by the proposed project owner and kept at least one copy.

At the end of each month, the monitoring data will be filed in a spreadsheet, and the paper-based printout will be also archived as well. Furthermore, the project owner collects the sales receipts for the electricity supplied to the grid as a cross-check, and compiled the monitoring report including the monitoring data and relevant evidence at the end of each crediting year.

All the data will be kept for two years following the end of the last crediting period.

Quality Assurance and Quality Control

The workers are trained to be competent and the metering equipments are calibrated and sealed as per the industry practices at regular intervals, with the purpose to provide credible, accurate, transparent and conservative monitoring data and ensure the real, measurable, long-term GHG emission reduction from this project.

Monthly metering data of the supplied and purchased electricity by the proposed project will be approved and signed off by the Manager before it is accepted and stored. This audit will check compliance with monitoring procedures in this monitoring plan. This internal audit will also identify potential improvements to procedures to improve monitoring and reporting in future years. The monitoring officers will also attend a training session organized by the CDM consultant. The purpose of training is to assure those staffs are competent to conduct the monitoring plan, thus to make the monitored data accurate.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline Emissions are calculated by multiplying the ex-ante Baseline Emission factor by annual power generation.

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

Where:

BE_y = Baseline emissions in year y (tCO_2/yr)

$EG_{Facility,y}$ = Quantity of net electricity generation supplied to the grid by the Project in year y. (MWh)

$EF_{grid,CM,y}$ = Combined margin emission factor for grid connected power generation in year y (tCO_2/MWh).

$EG_{facility,y} = EG_{output,y} - EG_{import,y} - EG_{im\text{-}spare,y}$

Where:

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (in MWh);

$EG_{output,y}$ = Electricity supplied to the grid by the project activity (in MWh);

$EG_{import,y}$ = Electricity delivered to the project activity by the grid via the main power line (in MWh);

$EG_{im\text{-}spare,y}$ = Electricity delivered to the project activity by the grid via the back-up power line (in MWh).

Period*	Electricity supplied to the grid by the project activity (MWh)	Electricity delivered to the project activity by the grid via the main power line (MWh)
	Conservative values ($EG_{output,y}$)	Conservative values ($EG_{import,y}$)
26/02/2011-26/03/2011	1,550.450	12.100
27/03/2011-25/04/2011	1,758.900	8.250
26/04/2011-26/05/2011	2,011.350	4.400
27/05/2011-25/06/2011	4,851.550	15.400
26/06/2011-26/07/2011	5,997.750	14.300
27/07/2011-26/08/2011	6,765.550	29.150
27/08/2011-25/09/2011	8,406.750	23.100
26/09/2011-26/10/2011	4,600.750	29.150
27/10/2011-25/11/2011	6,514.750	39.050
26/11/2011-26/12/2011	9,101.400	20.350
27/12/2011-26/01/2012	6,300.800	28.600
27/01/2012-25/02/2012	9,796.050	64.900
26/02/2012-29/02/2012	743.050	20.350
Total	**68,399.100**	**309.100**

Period	Electricity delivered to the project activity by the grid via the backup power line (MWh)
	Conservative values ($EG_{im\text{-}spare,y}$)
12/02/2011-12/03/2011	4.930
13/03/2011-11/04/2011	6.111
11/04/2011-12/05/2011	0.695
13/05/2011-11/06/2011	0.389

12/06/2011-12/07/2011	0.383
13/07/2011-12/08/2011	0.596
13/08/2011-11/09/2011	0.548
12/09/2011-12/10/2011	0.399
13/10/2011-11/11/2011	0.614
12/11/2011-12/12/2011	0.394
13/12/2011-12/01/2012	0.389
13/01/2012-10/02/2012	0.389
11/02/2012-12/03/2012	0.389
Total	**16.226**

$EG_{facility,y} = EG_{output,y} - EG_{import,y} - EG_{im-spare,y}$ =68,399.100-309.100-16.226=68,073.774MWh

$BE_y = EG_{Facility,y} \times EF_{grid,CM,y}$=68,073.774×0.9309=63,369tCO_2e

4.2 Project Emissions

According to ACM0002 (Version 12.2.0), no project emissions were to be counted by the Project.

Hence, PE_y=0 tCO_2e.

4.3 Leakage

According to the baseline methodology ACM0002 (version 12.2.0), the leakage of the Project is not considered.

4.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 1 (26/02/2011-29/02/2012)	63,369	0	-	63,369
Total	**63,369**	**0**	**-**	**63,369**

The annual average emission reductions estimated in the registered CDM-PDD is 84,709 tCO_2, so the estimated amount of emission reductions for the corresponding 369 days (the duration of this monitoring period) are 369/365×84,709=85,637tCO_2, which is higher than the actual value of 63,369 tCO_2.