INNER MONGOLIA XIMENG ZHELIGENTU WIND FARM PHASE I PROJECT

Document Prepared by Climate Bridge (Shanghai) Ltd.

Tel: +86 21 6246 2036; Fax: +86 21 2301 9950

Project Title	Inner Mongolia Ximeng Zheligentu Wind Farm Phase I Project
Version	2.0
Report ID	NA
Date of Issue	20/09/2020
Project ID	849
Monitoring Period	21/08/2012 to 20/07/2018(first and last days included)
Prepared By	Fan Zhang
Contact	Block B, Level 24, Jiangong Mansion, 33 Fushan Road, Pudong New Area, Shanghai, P.R. of China Telephone: +86-2162462036; Email: zhang.fan@climatebridge.com http://www.climatebridge.com

CONTENTS

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Inner Mongolia Ximeng Zheligentu Wind Farm Phase I Project (hereinafter referred to as the project) is to utilize wind resources for electricity generation through the construction of a wind farm with a total capacity of 48.75MW and a 220kV substation in Zhengxiangbai Qi, south Xilinguole League, Inner Mongolia Autonomous Region, P.R.China. The project is constructed and operated by Beijing International New Energy Co., Ltd. The electricity generated from the project was sold to West Inner Mongolia Power Grid, an integral part of the North China Power Grid. The estimated annual net electricity output and average annual emission reductions of the project are 99.48GWh and 104,941 tCO_2e during the first crediting period from 01/05/2009 to 30/04/2019.

The project started construction on 06/06/2008. The first wind turbine of the Project has been put into operation on 30/04/2009. And all the 39 wind turbines have been put into operation on 02/07/2009. The Project owner has implemented and operated the project as per the registered PD.

During this monitoring period, started from 21/08/2012 to 20/07/2018, the total emission reduction achieved is 531,211 tCO_2e

1.2 Sectoral Scope and Project Type

Sectoral scope: 1. Energy industries (renewable/non-renewable sources);

Project type: Energy industries (renewable/non-renewable sources)

The project is not a grouped project.

1.3 Project Proponent

Organization name	Beijing International New Energy Co., Ltd.
Contact person	Jiaman Xu
Title	Manager
Address	No.1, Nanbinhe Road, Guanganmenwai, Xuanwu District, 1003 Room, Gaoxin Building, Beijing City, China.
Telephone	021-23019950
Email	1169735462@qq.com

1.4 Other Entities Involved in the Project

Organization name	Climate Bridge (Shanghai) Ltd.
Role in the Project	Consultancy
Contact person	Zhiwen Gao
Title	General Manager
Address	Block B, Level 24, Jiangong Mansion, 33 Fushan Road, Pudong New Area, Shanghai, China 200120
Telephone	+86-2162462036
Email	gao.zhiwen@climatebridge.com

1.5 Project Start Date

The project started on 30/04/2009 (operation start date)

1.6 Project Crediting Period

The project crediting period is ten years, twice renewable for a total of 30 years. However, as the project is also registered as a CDM project with a seven year twice renewable project crediting period, it is not eligible for VCU issuance beyond the end of those 21 years. The project first crediting period is from 01/05/2009 to 30/04/2019.

1.7 Project Location

The project is located at Zhengxiangbai Qi, Xilinguole League, middle grassland of Inner Mongolia Autonomous Region, P. R. China. The project has geographical coordinates with east longitude of 115°29'34" and north latitude of 42°28'15". Figures 1 and 2 show the geographical location of the project.

Figure 1. Location of Inner Mongolia Autonomous Region in China

Figure 2. Location of the project

1.8 Title and Reference of Methodology

The methodology applied to the project is as follows:

- The approved methodology applied in the project activity is ACM0002 (version 07) – "Consolidated methodology for grid-connected electricity generation from renewable sources".
- "Tool for the Demonstration and Assessment of Additionality (version 05.2)" and "Tool to calculate the emission factor for an electricity system (version 01.1)" are also applied in the project.

More information regarding the methodologies is available on the following website:

https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG

1.9 Participation under other GHG Programs

The project has been registered as a Clean Development Mechanism (CDM) project in UNFCCC on 06/05/2010 (UNFCCC Ref. 2566), with the 7 years crediting period started from 06/05/2010. Total GHG emission reductions of 212,018 tCO_2 generated from 06/05/2010 to 20/08/2012 (both days included) by the project has been issued as CER under CDM program. Please refer to the following link for details:

https://cdm.unfccc.int/Projects/DB/BVQI1241775223.11/view?cp=1

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

The project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading.

Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

1.11 Sustainable Development

The project makes contribution to the local sustainable development as follows:

1. GHG emission reduction

The project activity achieves obvious greenhouse gas (GHG) emission reductions by avoiding CO_2 emissions, as grid-connected fossil fuel-fired power dominates in the North China Power Grid.

2. Pollutants emission reduction through replacing fossil fuel combustion

The project is to replace grid-connected fossil fuel-fired power plants in the North China Power Grid, and thus reduce fossil fuel consumption and avoid pollutants emission, such as sulfur

dioxide and dust, brought by fossil fuel combustion. Therefore, the project has obvious environmental benefit.

3. Employment opportunities

The conducting of the project offered 16 job opportunities for local people.

4. Economy development

The region can achieve economic growth and booming of local tourism through the construction and operation of the project. Furthermore, the project contributes to local government with more tax revenues and poverty eradication.

2 SAFEGUARDS

2.1 No Net Harm

The project doesn't cause significant impact on the environment and socio-economic as to the conclusion of the EIA. The conclusions of EIA are documented below:

Ambient air

The impact on ambient air quality of the project is mainly from dust during the construction phase. The excavation work is the primary emission source; however, it is a ground source and the particle size are quite large so that dust deposit quickly on the ground. Immediately replant the areas where construction has completed, and sprinkling water on the road frequently should be conducted. Therefore, the project doesn't pose any threat on the quality of ambient air.

Impact from noise

There is some noise during the operation of wind turbines. The equipments and techniques with lower noise was chosen to apply. Improvement on construction process and strengthening of equipment maintenance is emphasized. Meanwhile, the project site is very far from the village or resident.

Consequently, the noise of operation has little impact to the surrounding environment. As a result, the noise doesn't impact the work and daily life of local residents.

Electromagnetic impact

The operation of the wind farm generates electromagnetic pollution, whereas the pollution is slight. In addition, the project is very far from local residents and village. Therefore, the electronic magnetic pollution to the surrounding environment is insignificant.

Impact from Solid waste

Solid wastes generated from the project activity are excavated earth material and municipal solid waste. Part of the excavated earth material was backfilled, and the rest was used for land levelling and road construction near the project site. The municipal solid waste was collected and treated together with the waste from local residents. As the report indicates, solid waste is handled properly.

Impact from Wastewater

Wastewater is mainly domestic wastewater. Wastewater quantity is fairly small and treatment methods was applied for on-site primary treatment, and then the wastewater was treated together with the local wastewater. Small-scale septic tanks should be built on the site, through which the wastewater can meet the second-degree standard of discharge after treatment. Therefore, the impact of wastewater is limited and mitigate.

Impact on natural environment

In order to protect the landscape, vehicles are prohibited from driving on the landscape randomly and timely afforestation is required; hunting wild animals is strictly forbidden at the same time. The lands permanently taken by wind farms are normally mountain ridges, where most of the vegetation is grass and shrub, without rare plants. Hence, the project construction has little impact on the mountain's eco-environment.

No migrating birds have been found in the project field till now. Therefore, the project is not located on the passage of migrating birds, and the project construction doesn't influence the migration of birds.

2.2 Local Stakeholder Consultation

Local Stakeholder Consultation during the project preparation stage:

The project developer has sent out questionnaires to the stakeholders in the local County for the comments of the project construction in 06/03/2008. 50 copies of questionnaire were distributed, and 43 pieces of reply were received. The recovery ratio is 86%. Among the interviewees, there were 1 farmer, 6 workers, 17 government officials and 19 others. 8 of them have educational level of middle school or below middle school, 13 of high school, 21 of college and 1 other.

The summary of survey is listed as the following:

- 72% of them consider their current living and/or working environment is quiet, another 28% is unsure and only one person thinks different;
- 72% of them currently do not experience electromagnetic interference when watching TV at home, while other 21% have the experience, and 7% don't know;

- 84% of them think there are not any negative impacts on their everyday life, and the remainder is unsure;
- 88% of them think the project help improve local economics, while the other of them is unsure;
- 70% of them think the construction of the project have no noise impact on the environment while other 28% is not sure, and only one person thinks the construction of the project have noise impact on the environment;
- Regarding the construction and operation of the propose project, 21% of them are most concerned with the noise level, 30% of them are most concerned with electromagnetic interference, and 49% of them are most concerned with wastewater from the project;
- 93% of them support the implementation of the project and the others are not sure.

Local Stakeholder Consultation during the project implementation stage:

Communications with Local stakeholders are being carried out at periodic intervals. There are no negative comments received for the project. In line with VCS requirements all the processes have been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals.

2.3 AFOLU-Specific Safeguards

NA

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project involves the installation of 39 wind turbines with each capacity of 1250kW each, which amount to a total installed capacity of 48.75MW. The annual net electricity output is 99.48GWh. The wind turbines are supplied by a domestic manufacturer–Shanghai Electric Wind Power Equipment Co., Ltd. and the selected model is SEC-1250. The main technical specifications of the wind turbine are provided in the following Table.1:

Table 1 Key Technical specifications of wind turbines

Item	Unit	Index
Type	SEC-1250	
Rated capacity	kW	1250
Number of blades	-	3

Rotor diameter	m	64
Swept area	m^2	3217
Cut-in speed	m/s	2.8
Rated wind speed	m/s	12.3
Safe wind speed	m/s	50.3
Cut-out speed	m/s	23
Height of hub	m	68
Rated voltage of generator	V	690
Rated capacity of generator	kW	1250
Lifetime	years	24

The project started construction on 06/06/2008. The first wind turbine of the Project has been put into operation on 30/04/2009. And all the 39 wind turbines have been put into operation on 02/07/2009. During this monitoring period, no events that may impact the GHG emission reductions or removals and monitoring occurred.

3.2 Deviations

2.3.1 Methodology Deviations

There is no deviation applied to this monitoring period.

2.3.2 Project Description Deviations

The project is registered under VCS Version 2007.1 and completed validation before 19/03/ 2020. thus, it remains eligible to apply the crediting period requirements under VCS 2007.1 which shall be a maximum of ten years and may be renewed at most twice, so the first renewable crediting period of the project should be updated from 01/05/2009-05/05/2010 to 01/05/2009-30/04/2019.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

The baseline gird emission factor $EF_{grid,CM,y}$ is obtained directly from the official source Notification on Determining Baseline Emission Factor of China's Grid by China's DNA. Thus, the relevant basis parameters for calculation of $EF_{grid,CM,y}$ are not described in detail here. With

consideration of the fact of the Project, data and parameters that are available at validation are summarized in below tables.

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	The baseline grid emission factor
Source of data	Registered PD
Value applied	1.0549
Justification of choice of data or description of measurement methods and procedures applied	According to registered PD, the project chooses ex-ante for the calculation of the grid emission factor, therefore no need to monitor during the crediting period
Purpose of Data	Baseline emission calculations
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	EG_y
Data unit	MWh
Description	Net Electricity supplied to the grid by the project activity in year y
Source of data	Calculation by $EG_{export,y}$, $EG_{import,y}$, $EG_{A-i,y}$ and $EG_{B-i,y}$ according to the equation (1) in section 4.3.
Description of measurement methods and procedures to be applied	The net electricity supplied to the Grid by the project was calculated through $EG_{export,y}$, $EG_{import,y}$, $EG_{A-i,y}$ and $EG_{B-i,y}$ according to the equation (1) in section 4.3
Frequency of monitoring/recording	Continuously measured, and monthly recorded
Value monitored	

Year	Value
21/08/2012-31/12/2012	33,151.062
01/01/2013-31/12/2013	84,968.305
01/01/2014-31/12/2014	85,835.479
01/01/2015-31/12/2015	82,411.041
01/01/2016-31/12/2016	80,629.887
01/01/2017-31/12/2017	84,053.416
01/01/2018-20/07/2018	52,518.926

	Total	503,568.115
Monitoring equipment	Not applicable	
QA/QC procedures to be applied	Power supplied to the grid was checked by internal verification procedure and electricity sales receipts	
Purpose of the data	Baseline emission calculations	
Calculation method	Not applicable	
Comments	-	

Data / Parameter	$EG_{export, y}$
Data unit	MWh
Description	Total electricity supplied to the grid by the proposed project and Project B during year y
Source of data	Bidirectional electricity meter reading of M1 installed at the project site.
Description of measurement methods and procedures to be applied	The readings of the electricity meter are hourly measured and monthly recorded. Data was archived for 2 years following the end of the crediting period by means of electronic and paper backup. The accuracy of electricity meter is 0.2S. The calibration frequency is one time/year according to the national calibration standard.
Frequency of monitoring/recording	Hourly measurement and monthly recording

Value monitored

Year	Value
21/08/2012-31/12/2012	67,011.503
01/01/2013-31/12/2013	174,072.308
01/01/2014-31/12/2014	172,233.370
01/01/2015-31/12/2015	171,035.925
01/01/2016-31/12/2016	162,319.173
01/01/2017-31/12/2017	174,687.571
01/01/2018-20/07/2018	110,111.967
Total	1,031,471.817

<table>
<tr><td>Monitoring equipment</td><td>The main meter and the backup meter were calibrated by Inner Mongolia Electricity Science Research Institute Electricity Measurement and Testing Center annually according to Chinese national calibration standards. Information of the meters is listed in the blow table:
<table>
<tr><td>Meter</td><td>Main meter M1</td><td>Backup meter M2</td></tr>
<tr><td>Serial No.</td><td>95232476</td><td>95232477</td></tr>
<tr><td>Type</td><td>ZMQ202C</td><td>ZMQ202C</td></tr>
<tr><td>Accuracy</td><td colspan="2">0.2S</td></tr>
<tr><td>Date of Calibration</td><td colspan="2">14/03/2012
14/03/2013
14/03/2014
14/03/2015
14/03/2016
14/03/2017
14/03/2018</td></tr>
<tr><td>Validity</td><td colspan="2">From 14/03/2012 to 13/03/2013
From 14/03/2013 to 13/03/2014
From 14/03/2014 to 13/03/2015
From 14/03/2015 to 13/03/2016
From 14/03/2016 to 13/03/2017
From 14/03/2017 to 13/03/2018
From 14/03/2018 to 13/03/2019</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures to be applied</td><td>The electricity supplied by the project activity to the grid is monitored and recorded at the central control room. The project operator is responsible for recording such data. Double check by receipt of sales.</td></tr>
<tr><td>Purpose of the data</td><td>Baseline emission calculations</td></tr>
<tr><td>Calculation method</td><td>-</td></tr>
<tr><td>Comments</td><td>The reading from the main meter is first choice. When the main meter is out of order, the reading from the backup meter will be used.</td></tr>
</table>

<table>
<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>Total electricity purchased from the grid by the proposed project and project B during year y</td></tr>
<tr><td>Source of data</td><td>Electricity meter reading of M1 installed at the project site</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>The readings of the electricity meter are hourly measured and monthly recorded. Data was archived for 2 years following the end of the crediting period by means of electronic and paper backup.
The accuracy of electricity meter is 0.2S. The calibration frequency is one time/year according to the national calibration standard.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measured and monthly recorded</td></tr>
<tr><td>Value monitored</td><td>
<table>
<tr><th>Year</th><th>Value</th></tr>
<tr><td>21/08/2012-31/12/2012</td><td>315.805</td></tr>
<tr><td>01/01/2013-31/12/2013</td><td>731.899</td></tr>
<tr><td>01/01/2014-31/12/2014</td><td>772.696</td></tr>
<tr><td>01/01/2015-31/12/2015</td><td>871.282</td></tr>
<tr><td>01/01/2016-31/12/2016</td><td>857.775</td></tr>
<tr><td>01/01/2017-31/12/2017</td><td>938.621</td></tr>
<tr><td>01/01/2018-20/07/2018</td><td>538.735</td></tr>
<tr><td>Total</td><td>5,026.813</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment</td><td>The main meter and the backup meter were calibrated by Inner Mongolia Electricity Science Research Institute Electricity Measurement and Testing Center annually according to Chinese national calibration standards. Information of the meters is listed in the blow table:
<table>
<tr><td>Meter</td><td>Main meter M1</td><td>Backup meter M2</td></tr>
<tr><td>Serial No.</td><td>95232476</td><td>95232477</td></tr>
<tr><td>Type</td><td>ZMQ202C</td><td>ZMQ202C</td></tr>
<tr><td>Accuracy</td><td colspan="2">0.2S</td></tr>
</table>
</td></tr>
</table>

	Date of Calibration	14/03/2012 14/03/2013 14/03/2014 14/03/2015 14/03/2016 14/03/2017 14/03/2018
	Validity	From 14/03/2012 to 13/03/2013 From 14/03/2013 to 13/03/2014 From 14/03/2014 to 13/03/2015 From 14/03/2015 to 13/03/2016 From 14/03/2016 to 13/03/2017 From 14/03/2017 to 13/03/2018 From 14/03/2018 to 13/03/2019
QA/QC procedures to be applied	The electricity supplied by the project activity to the grid is monitored and recorded at the central control room. The project operator is responsible for recording such data Double check by receipt of sales.	
Purpose of the data	Baseline emission calculations	
Calculation method	-	
Comments	It is conservative for calculation of emission reductions by deduction of electricity purchased from the grid by both the project (Project A) and Project B	

Data / Parameter	$EG_{A\text{-}i,\,y}$
Data unit	MWh
Description	Quantity of electricity supplied to the grid by Group A-i (i=1,2,3) of the proposed project in year y.
Source of data	Readings of electricity meters (A-1, A-2, and A-3 described in section 4.3) installed at the 35kV transmission line of the Project site.

<table>
<tr><td>Description of measurement methods and procedures to be applied</td><td>The readings of the electricity meters are continuously measured and monthly recorded. Data is archived for 2 years following the end of the last crediting period by means of electronic and paper backup. The accuracy of electricity meters should be not lower than 0.5S. The calibration frequency is once a year.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measured and monthly recorded</td></tr>
<tr><td>Value monitored</td><td><table>
<tr><th>Year</th><th>Value</th></tr>
<tr><td>21/08/2012-31/12/2012</td><td>33,822.289</td></tr>
<tr><td>01/01/2013-31/12/2013</td><td>87,091.672</td></tr>
<tr><td>01/01/2014-31/12/2014</td><td>87,503.031</td></tr>
<tr><td>01/01/2015-31/12/2015</td><td>83,638.209</td></tr>
<tr><td>01/01/2016-31/12/2016</td><td>80,342.953</td></tr>
<tr><td>01/01/2017-31/12/2017</td><td>85,737.483</td></tr>
<tr><td>01/01/2018-20/07/2018</td><td>53,478.935</td></tr>
<tr><td>Total</td><td>511,614.573</td></tr>
</table></td></tr>
<tr><td>Monitoring equipment</td><td>The meters were calibrated by Xilingol Electric Power Bureau Electricity Measurement and Testing Center annually according to Chinese national calibration standards. Information of the meters is listed in the blow table:<table>
<tr><td>Meter</td><td>Meter A-1</td><td>Meter A-2</td><td>Meter A-3</td></tr>
<tr><td>Serial No.</td><td>9030094</td><td>9030093</td><td>9030096</td></tr>
<tr><td>Type</td><td>DSSD331</td><td>DSSD331</td><td>DSSD331</td></tr>
</table></td></tr>
</table>

	Accuracy	0.5[1]
	Date of Calibration	12/09/2011 12/09/2012 12/09/2013 12/09/2014 12/09/2015 12/09/2016 12/09/2017
	Validity	From 12/09/2011 to 11/09/2012 From 12/09/2012 to 11/09/2013 From 12/09/2013 to 11/09/2014 From 12/09/2014 to 11/09/2015 From 12/09/2015 to 11/09/2016 From 12/09/2016 to 11/09/2017 From 12/09/2017 to 11/09/2018
QA/QC procedures to be applied	The metering equipments at the substation is calibrated once a year according to the management standard.	
Purpose of the data	Baseline emission calculations	
Calculation method	The sum of readings of electricity meters (A-1, A-2, and A-3 described in 4.3) installed at the 35kV transmission line of the Project site.	
Comments	-	

Data / Parameter	$EG_{B\text{-}i,\,y}$
Data unit	MWh
Description	Quantity of electricity supplied to the grid by Group B-i (i=1,2,3) of the Project B in year y.

[1] The actual meter accuracy for meters A-1, A-2 and A-3 is 0.5, which is lower than the stipulated 0.5S in the registered PD, the situation has been considered in the calculation of emission reductions.

<table>
<tr><td>Source of data</td><td>Readings of electricity meters (B-1, B-2, and B-3 described in section 4.3) installed at the 35kV transmission line of the Project B site.</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>The readings of the electricity meters are continuously measured and monthly recorded. Data is archived for 2 years following the end of the last crediting period by means of electronic and paper backup. The accuracy of electricity meters should be no lower than 0.5S. The calibration frequency is once a year.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measured and monthly recorded</td></tr>
<tr><td>Value monitored</td><td><table>
<tr><th>Year</th><th>Value</th></tr>
<tr><td>21/08/2012-31/12/2012</td><td>33,910.985</td></tr>
<tr><td>01/01/2013-31/12/2013</td><td>89,779.487</td></tr>
<tr><td>01/01/2014-31/12/2014</td><td>86,502.474</td></tr>
<tr><td>01/01/2015-31/12/2015</td><td>88,139.743</td></tr>
<tr><td>01/01/2016-31/12/2016</td><td>81,821.197</td></tr>
<tr><td>01/01/2017-31/12/2017</td><td>90,504.089</td></tr>
<tr><td>01/01/2018-20/07/2018</td><td>57,486.684</td></tr>
<tr><td>Total</td><td>528,144.660</td></tr>
</table></td></tr>
<tr><td>Monitoring equipment</td><td>The meters were calibrated by Xilingol Electric Power Bureau Electricity Measurement and Testing Center annually according to Chinese national calibration standards. Information of the meters is listed in the blow table.<table>
<tr><td>Meter</td><td>Meter B-1</td><td>Meter B-2</td><td>Meter B-3</td></tr>
<tr><td>Serial No.</td><td>9030087</td><td>0010037</td><td>0010038</td></tr>
<tr><td>Type</td><td>DSSD331</td><td>DSSD331</td><td>DSSD331</td></tr>
</table></td></tr>
</table>

	Accuracy	0.5[2]	0.5S	0.5S
	Date of Calibration	12/09/2011 12/09/2012 12/09/2013 12/09/2014 12/09/2015 12/09/2016 12/09/2017		
	Validity	From 12/09/2011 to 11/09/2012 From 12/09/2012 to 11/09/2013 From 12/09/2013 to 11/09/2014 From 12/09/2014 to 11/09/2015 From 12/09/2015 to 11/09/2016 From 12/09/2016 to 11/09/2017 From 12/09/2017 to 11/09/2018		
QA/QC procedures to be applied	The metering equipments at the substation were calibrated once a year according to the management standard.			
Purpose of the data	Baseline emission calculations			
Calculation method	The sum of readings of electricity meters (B-1, B-2, and B-3 described in 4.3) installed at the 35kV transmission line of the Project B site.			
Comments	-			

4.3 Monitoring Plan

This Monitoring plan sets out a number of monitoring tasks in order to ensure the complete, consistent, clear and accurate monitoring and the accurate calculation of the emission reduction in the crediting period. This plan is mainly implemented by the project owner with the cooperation of the grid company.

1. Monitoring Object

[2] The actual meter accuracy for meters B-1 is 0.5, which is lower than the stipulated 0.5S in the registered PD, the situation has been considered in the calculation of emission reductions.

The main objective data is the power supplied to and purchased from the grid which is calculated according to the generated electricity and the purchased electricity and supplied to the grid, thus to calculate the emission reduction of the project.

2. Monitoring Implementers

The General Manager of the project entity appoint a VCS project manager or a chief officer. The operational and monitoring manager of the plant, the Financial Chief, and the Technical Chief are responsible for the collection of the data and information required in the monitoring plan. The collected information is documented and sent to the VCS manager or responsible staffs of the project entity monthly. The VCS manager in charge of the implementation of the Monitoring Plan and report to the General Manager of the company. The General Manager of the company makes the confirmations on monitoring, calculation data and reports.

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

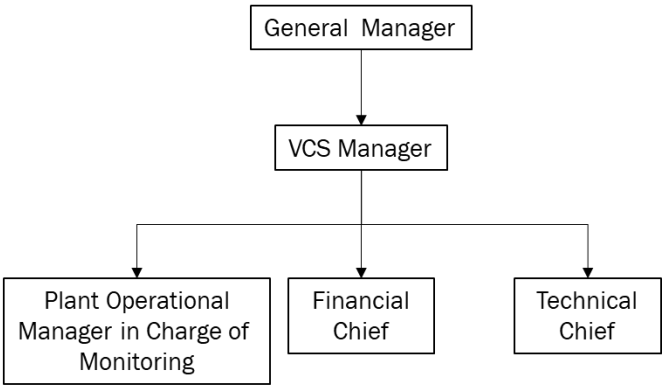

Figure 3 Operations and Monitoring Procedure of the Project

3. Monitoring Program and Equipments

The power connection and monitoring system is shown as below.

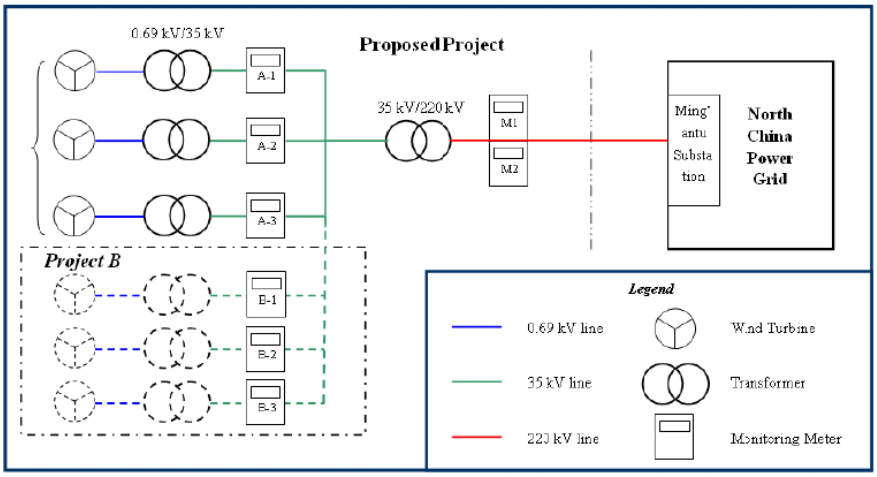

Figure 4: The location of meters

The project shares the transformer and gateway meters (the main meter M1 and backup meter M2) with another wind farm project (hereafter refer to Project B). Monitoring equipments include two bidirectional meters and six auxiliary meters. Both M1 (main meter) and M2 (backup meter) are equipped at the project site. The project owner and the Grid Company are responsible for conducting the monitoring.

M1 was used to monitor the electricity exports to and imports from the grid by the project and project B as well as M2. The metering was hourly measured and daily recorded. The metering of M2 was used in case that M1 fails to work. Both meters have an accuracy of 0.2s. They were calibrated annually to ensure normal performance.

The 39 sets of wind turbines were divided into 3 groups, and each group is connected with a 35kV transmission line and installed with a meter at the low voltage side of 35kV/220kV transformer. These meters (A-1, A-2, A-3) are installed as auxiliary meters to calculate the electricity supplied to the grid by Group A-i (i=1,2,3) of the project activity. Similarly, three meters (B-1, B-2, B-3) are installed as auxiliary meters to calculate the electricity supplied to the grid by Group B-i (i=1,2,3) of the Project B. The precision of these six auxiliary meters should be no lower than 0.5S.

In order to deal with the jointly-reading problem, the project owner and the grid company set up the procedure and calculation method to determine the net electricity supplied to the grid by the project, which is calculated as follows:

$$EG_y = \frac{\sum_{i=1,2,3} EG_{A-i,y}}{\sum_{i=1,2,3} EG_{A-i,y} + \sum_{i=1,2,3} EG_{B-i,y}} \times EG_{export} - EG_{import} \quad \text{..... (1)}$$

Where:

EG_y = Net electricity supplied to the grid by the Project in the year y.

$EG_{export,y}$ = Total electricity supplied to the grid by the proposed project and Project B in the year y.

$EG_{import,y}$ = Total electricity purchased from the grid by the proposed project and Project B in the year y.

$EG_{A-i,y}$ = Electricity supplied to the grid by Group A-i (i=1,2,3) of the proposed project in year y.

$EG_{B-i,y}$ = Electricity supplied to the grid by Group B-i (i=1,2,3) of the Project B in year y.

4. Data Collection

The verification uses the main meter and six auxiliary meters' data as long as the inaccuracy of these meters is within the permissible tolerance. The main procedures are as follows:

I. According to the requirements of power purchase/sales agreement, the project owner and the grid company should collect the data of both the main meter (M1) and the backup meter (M2) periodically, and check them at the same time.

II. For the electricity supplied to the grid by the project activity, the project owner collects and records the data of auxiliary meters and calculates the electricity supplied to the grid by the project as per the procedure and calculation method jointly set up. The project owner provides sales receipts to the Grid Company. A copy of the sales receipts is stored for cross-check.

III. When the electricity generated by this project cannot meet the electricity requirement of the power plant, the grid company supplies the electricity to the project owner. The Grid Company provides an electricity sales receipt to the project owner and the receipt is stored by the project owner.

IV. The project owner records the power supplied to and purchased from the grid, and hence calculate the net electricity supplied to the grid;

V. The project owner keeps and safe keeps the records of the main meter and the six auxiliary meters' data readings for verification by the DOE.

In any case that any of the six auxiliary meters exceeds the allowable tolerance or its malfunction occurs, the project owner will give up the emission reductions during the period when any of the six auxiliary meters are inaccurate. Otherwise, if the fault of the main meter M1 exceeds the allowable tolerance or its malfunction occurs, but the six auxiliary meters are within the allowable tolerance, the grid-connected electricity generated by the project will be resolved by following measures:

I. Adopting the backup meter M2 and the six auxiliary meters' data, unless a test by either party reveals it is inaccuracy;

II. If the inaccuracy of the backup meter M2 is not within the acceptable limits or it cannot work properly, the project owner will give up the emission reductions during the period when both the main meter and the backup meter are inaccurate;

5. Calibration of Meters & Metering

The metering equipment is properly calibrated and checked annually for accuracy. The project owner prepares backup procedures to deal with any errors occurred to the meters. The calibration records carried out by the grid company should be provided to the project owner, and these records are maintained by the project owner and the third party designated.

Meters were tested by a qualified metric organization co-authorized by the project owner and the grid company within 10 days after:

I. The detection of the reading difference between the main meter and the backup meter that exceeds the allowable tolerance.

II. The equipments malfunction caused by improper operation All the calibration test records should be maintained safely for the verification.

6. Data Management System

To keep safely the record of the data collected during monitoring, this project sets up a complete data management system. The project perfects the whole monitoring procedure by developing the VCS manual, tracking information from the primary source to the end-data calculations in paper document format. It is the responsibility of the 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 were collated in a central place, together with this monitoring plan. All paper-based information was stored by the project owner and kept at least one copy.

At the end of each month, the monitoring data was filed in a spreadsheet and stored on a hard disk and CD-ROM, and the paper-based printout should be also archived. 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 were kept for two years following the end of the last crediting period

7. Monitoring Report

After the VCS project manager collects and sorts the monitored data, the monitoring report is prepared by the project developer. The project developer has to make sure that the format and content of the monitoring report are consistent with the monitoring methodology in the registered PD.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

In accordance with the registered PD, baseline emissions are calculated according to the following formula:

$BE_y = EG_{PL,y} * EF_{grid,CM,y}$ (1)

$$EG_y = \frac{\sum_{i=1,2,3} EG_{A-i,y}}{\sum_{i=1,2,3} EG_{A-i,y} + \sum_{i=1,2,3} EG_{B-i,y}} \times EG_{export,\ y} - EG_{import,y} \quad (2)$$

Where:

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

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system

EG_y = Net electricity supplied to the grid by the project in the year y.

$EG_{export,y}$ = Total electricity supplied to the grid by the project and Project B in the year y.

$EG_{import,y}$ = Total electricity purchased from the grid by the project and Project B in the year y.

$EG_{A\text{-}i,y}$ = Electricity supplied to the grid by Group A-i (i=1,2,3) of the project in year y.

$EG_{B\text{-}i,y}$ = Electricity supplied to the grid by Group B-i (i=1,2,3) of the Project B in year y.

The emission factor $EF_{grid,CM,y}$ is equal to 1.0549 tCO_2/MWh which has been calculated in the Project Description and is fixed during the first crediting period.

The monitored data based on meter readings and sales receipts for the Project are as following:

Table 1 The $EG_{A-i,y}$ and $EG_{B-i,y}$ during the Monitoring Period

Period[3]	MA-1	MA-2	MA-3	Monitoring records $EG_{A-i,y}$ (Conservativeness)	MB-1	MB-1 (Conservativeness)	MB-2	MB-3	Monitoring records $EG_{B-i,y}$
	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh
	a	b	c	A=(a+b+c) *(1-0.5%)[4]	d	e=d*(1+0.5%)[5]	e	f	B=d+e+f
21/08/2012-20/09/2012	1,190.640	1,413.885	1,116.225	3,702.146	1,294.240	1,300.711	1,536.910	1,213.350	4,050.971
21/09/2012-20/10/2012	2,801.068	2,686.691	2,658.151	8,105.180	2,907.021	2,921.556	2,561.631	2,385.248	7,868.435
21/10/2012-20/11/2012	3,410.400	3,618.080	3,215.520	10,192.780	3,482.442	3,499.854	3,263.868	2,939.440	9,703.162
21/11/2012-20/12/2012	3,294.313	3,194.800	3,294.637	9,734.831	3803.873	3,822.892	3,051.598	3,167.280	10,041.770
21/12/2012-31/12/2012	661.510	604.760	831.570	2,087.351	874.487	878.859	650.260	717.528	2,246.647
Subtotal（2012）				**33,822.289**					**33,910.985**
01/01/2013-20/01/2013	1,543.490	1,411.240	1,247.430	4,181.149	2,040.470	2,050.672	1,517.273	1,674.232	5,242.177

[3] According to power purchase agreement, the time of meter reading for $EG_{export,y}$ and $EG_{import,y}$ with the power company is at 24:00 of 20th of every month. The electricity for the period from 21/12/2012 to 31/12/2012, 21/12/2013 to 31/12/2013, 21/12/2014 to 31/12/2014, 21/12/2015 to 31/12/2015, 21/12/2016 to 31/12/2016 and 21/12/2017 to 31/12/2017, is also from the sales(purchases) receipts confirmed by local grid company based on the monitoring daily data for the convenience of financial settlement at the end of year.

[4] Since the accuracy of the meters of MA-1~MA-3 is 0.5, which is lower than the registered PD requirement (0.5S), the accuracy difference has been considered and the electricity amount of $EG_{A-i,y}$ is conservatively calculated by deduction of 0.5%.

[5] Since the accuracy of the meter MB-1 is 0.5, which is lower than the registered PD requirement (0.5S), the accuracy difference has been considered and the electricity amount of MB-1 is conservatively calculated by addition of 0.5%, as the electricity of MB-1 is generated by the project B which shares the gateway meter with the proposed project.

21/01/2013-20/02/2013	1,261.137	1,153.040	1,189.073	3,585.234	1,378.650	1,385.543	1,025.150	1,131.200	3,541.893
21/02/2013-20/03/2013	2,488.550	2,540.960	2,623.490	7,614.735	2,366.910	2,378.745	1,760.010	1,942.080	6,080.835
21/03/2013-20/04/2013	3,351.600	3,064.320	3,160.080	9,528.120	3,537.397	3,555.084	2,630.373	2,902.480	9,087.937
21/04/2013-20/05/2013	3,333.225	3,047.520	3,142.755	9,475.883	3,493.717	3,511.186	2,597.893	2,866.640	8,975.719
21/05/2013-20/06/2013	2,312.513	2,531.440	2,791.797	7,597.571	3,163.852	3,179.671	2,683.378	2,857.520	8,720.569
21/06/2013-20/07/2013	1,437.537	1,314.320	1,355.393	4,086.714	1,989.488	1,999.435	1,479.362	1,632.400	5,111.197
21/07/2013-20/08/2013	1,906.437	2,091.600	1,963.213	5,931.444	1,908.597	1,918.140	1,814.085	1,722.438	5,454.663
21/08/2013-20/09/2013	1,869.524	1,720.707	1,836.979	5,400.074	2,197.894	2,208.883	1,835.357	1,992.119	6,036.359
21/09/2013-20/10/2013	2,713.375	3,480.800	2,558.325	8,708.738	3,188.640	3,204.583	3,271.040	2,516.320	8,991.943
21/10/2013-20/11/2013	3,457.362	3,218.160	3,531.228	10,155.716	3,840.290	3,859.491	3,599.190	2,971.520	10,430.201
21/11/2013-20/12/2013	2,555.963	2,336.880	2,609.907	7,465.236	3,607.695	3,625.733	2,682.645	2,960.160	9,268.538
21/12/2013-31/12/2013	1,167.282	1,092.944	1,117.723	3,361.059	936.781	941.465	773.504	1,122.486	2,837.455
Subtotal（2013）				**87,091.672**					**89,779.487**
01/01/2014-20/01/2014	2,723.658	2,550.202	2,608.021	7,842.472	2,185.821	2,196.750	1,804.841	2,619.137	6,620.728
21/01/2014-20/02/2014	1,364.176	1,288.675	1,437.509	4,069.908	1,183.711	1,189.630	1,198.144	1,373.815	3,761.589
21/02/2014-20/03/2014	2,243.387	2,308.240	2,586.623	7,102.559	2,107.723	2,118.262	2,233.947	2,196.080	6,548.289
21/03/2014-20/04/2014	2,536.363	2,318.960	2,391.427	7,210.516	3,209.115	3,225.161	2,386.265	2,533.120	8,144.546

21/04/2014-20/05/2014	2,712.488	3,268.560	3,183.202	9,118.429	2,829.753	2,843.902	2,968.277	3,216.720	9,028.899
21/05/2014-20/06/2014	2,757.588	3,124.080	2,868.582	8,706.499	2,844.770	2,858.994	2,765.470	2,677.760	8,302.224
21/06/2014-20/07/2014	1,684.943	2,098.234	1,763.803	5,519.245	1,547.008	1,554.743	1,765.724	1,665.183	4,985.650
21/07/2014-20/08/2014	1,148.438	1,250.350	1,082.812	3,464.192	1,183.127	1,189.043	985.403	1,088.720	3,263.166
21/08/2014-20/09/2014	839.862	942.160	774.728	2,543.966	731.967	735.627	618.643	682.640	2,036.910
21/09/2014-20/10/2014	2,175.725	2,463.520	2,334.255	6,938.633	2,175.427	2,186.304	1840.702	1931.121	5,958.127
21/10/2014-20/11/2014	2,966.875	2,844.000	2,551.625	8,320.688	2,772.067	2,785.927	2,599.743	2,951.440	8,317.110
21/11/2014-20/12/2014	4,672.150	4,271.680	4,405.170	13,282.255	6,390.930	6,422.885	4752.230	5243.840	16,418.955
21/12/2014-31/12/2014	1,160.236	1,112.215	1,128.223	3,383.671	967.763	972.602	1,049.619	1,094.062	3,116.283
Subtotal（2014）				**87,503.031**					**86,502.474**
01/01/2015-20/01/2015	2,707.217	2,595.170	2,632.519	7,895.231	2,258.114	2,269.405	2,449.110	2,552.812	7,271.327
21/01/2015-20/02/2015	1,771.963	1,620.080	2,670.707	6,032.436	2,625.577	2,638.705	2,152.353	2,154.320	6,945.378
21/02/2015-20/03/2015	3,061.687	3,256.400	2,358.163	8,632.869	2,494.263	2,506.734	2,441.887	2,687.600	7,636.221
21/03/2015-20/04/2015	3,342.900	3,282.080	3,469.020	10,043.530	3,230.217	3,246.368	3,399.393	3,578.640	10,224.401
21/04/2015-20/05/2015	3,397.537	3,106.320	3,203.393	9,658.714	3,748.917	3,767.662	3,285.093	3,404.240	10,456.995
21/05/2015-20/06/2015	2,362.000	2,202.400	2,655.600	7,183.900	2,232.430	2,243.592	2,808.730	2,995.840	8,048.162
21/06/2015-20/07/2015	879.263	621.040	940.447	2,428.546	818.317	822.409	808.492	771.441	2,402.342

21/07/2015-20/08/2015	1,133.737	1,036.560	1,068.953	3,223.054	1,485.120	1,492.546	1,104.320	1,218.560	3,815.426
21/08/2015-20/09/2015	1,283.113	1,204.560	1,164.077	3,633.491	1,209.197	1,215.243	1,040.173	1,140.880	3,396.296
21/09/2015-20/10/2015	3,422.038	3,528.720	3,226.492	10,126.364	4,291.560	4,313.018	3,691.160	3,521.280	11,525.458
21/10/2015-20/11/2015	1,813.000	2,657.600	1,709.400	6,149.100	2,433.113	2,445.279	2,109.237	1,996.400	6,550.916
21/11/2015-20/12/2015	2,364.250	2,161.600	2,229.150	6,721.225	3,043.950	3,059.170	2,263.450	2,497.600	7,820.220
21/12/2015-31/12/2015	593.685	652.602	673.059	1,909.749	660.687	663.990	714.357	668.256	2,046.603
Subtotal（2015）				**83,638.209**					**88,139.743**
01/01/2016-20/01/2016	1,385.265	1,522.738	1,570.473	4,456.084	1,541.603	1,549.311	1,666.833	1,559.264	4,775.408
21/01/2016-20/02/2016	2,074.863	2,314.160	2,067.727	6,424.466	2,203.110	2,214.126	2138.210	2,407.680	6,760.016
21/02/2016-20/03/2016	1,772.988	1,978.160	1,943.102	5,665.779	1,693.500	1,701.968	1,928.500	1,828.000	5,458.468
21/03/2016-20/04/2016	3,121.300	2,853.760	2,942.940	8,873.410	3,198.440	3,214.432	2,898.840	3,098.720	9,211.992
21/04/2016-20/05/2016	3,197.050	3,380.160	3,285.790	9,813.685	3,119.570	3,135.168	3,063.270	3,380.160	9,578.598
21/05/2016-20/06/2016	2,876.087	2,715.280	2,768.883	8,318.449	2,090.498	2,100.950	2,254.472	2,715.280	7,070.702
21/06/2016-20/07/2016	1,516.924	1,661.187	1,413.099	4,568.254	1,502.127	1,509.638	1,786.197	1,670.976	4,966.811
21/07/2016-20/08/2016	1,275.713	1,192.080	1,019.957	3,470.311	1,179.360	1,185.257	1,276.960	1,167.680	3,629.897
21/08/2016-20/09/2016	1,849.825	1,959.840	1,989.835	5,770.503	1,790.607	1,799.560	1,959.683	1,858.960	5,618.203
21/09/2016-31/10/2016	1,559.387	1,791.440	1,647.423	4,973.259	1,612.993	1,621.058	1,719.917	1,897.840	5,238.815

21/10/2016-30/11/2016	2,516.975	3,215.520	3,316.005	9,003.258	2,588.448	2,601.390	2,411.922	2,764.880	7,778.192
21/12/2016-20/12/2016	2,767.762	3,256.240	3,026.748	9,005.496	3,333.330	3,349.997	3,278.630	2,735.040	9,363.667
21/12/2016-31/12/2016	732.108	641.928	781.989	2,145.245	805.896	809.925	899.256	661.248	2,370.429
Subtotal（2016）				**80,342.953**					**81,821.197**
01/01/2017-20/01/2017	1,708.254	1,497.832	1,824.639	5,005.571	1,880.424	1,889.826	2,098.264	1,542.912	5,531.002
21/01/2017-20/02/2017	2,136.400	1,953.280	2,014.320	6,073.480	2,125.850	2,136.479	,2324.350	2,064.800	6,525.629
21/02/2017-20/03/2017	2,314.025	2,215.680	2,681.795	7,175.443	3,456.863	3,474.147	2,570.487	2,836.400	8,881.034
21/03/2017-20/04/2017	3,046.663	3,125.520	3,032.567	9,158.726	3,018.150	3,033.241	2,959.650	3,207.200	9,200.091
21/04/2017-20/05/2017	3,044.125	3,283.200	3,870.175	10,146.513	3,581.077	3,598.982	3,662.852	3,938.321	11,200.155
21/05/2017-20/06/2017	1,301.562	1,490.000	1,327.188	4,098.156	2,099.453	2,109.950	1,814.977	1,930.320	5,855.247
21/06/2017-20/07/2017	1,119.038	1,023.120	1,055.092	3,181.264	1,408.680	1,415.723	1,547.480	1,155.840	4,119.043
21/07/2017-20/08/2017	975.063	857.200	1,096.487	2,914.106	983.700	988.619	1,100.700	1,145.600	3,234.919
21/08/2017-20/09/2017	1,899.775	1,794.080	1,962.645	5,628.218	2,156.562	2,167.345	2,347.188	1,890.340	6,404.873
21/09/2017-20/10/2017	1,330.437	1,556.400	1,414.413	4,279.744	1,368.220	1,375.061	1,358.420	1,471.360	4,204.841
21/10/2017-20/11/2017	4,051.975	3,887.520	4,009.005	11,888.758	3,424.510	3,441.633	3,033.610	3,450.880	9,926.123
21/11/2017-20/12/2017	4,152.013	4,521.840	4,631.897	13,239.221	4,778.865	4,802.759	3,553.515	4,321.120	12,677.394
21/12/2017-31/12/2017	1,037.085	948.192	977.823	2,948.285	887.427	891.864	994.497	857.376	2,743.737

Subtotal (2017)				**85,737.483**					**90,504.089**
01/01/2018-20/01/2018	2,419.865	2,212.448	2,281.587	6,879.331	2,070.663	2,081.016	2,320.493	2,000.544	6,402.053
21/01/2018-20/02/2018	2,873.400	3,535.680	2,914.920	9,277.380	3,611.790	3,629.849	3,685.690	3,963.520	11,279.059
21/02/2018-20/03/2018	2,653.475	2,700.320	2,784.705	8,097.808	2,686.865	2,700.299	2,441.515	2,325.120	7,466.934
21/03/2018-20/04/2018	3,749.113	3,427.760	3,534.877	10,658.191	4,681.267	4,704.673	4,480.943	4,641.040	13,826.656
21/04/2018-20/05/2018	1,927.500	1,928.000	2,194.500	6,019.750	1,850.502	1,859.755	1,896.528	2,092.720	5,849.003
21/05/2018-20/06/2018	2,365.962	2,488.880	2,147.908	6,967.736	2,256.317	2,267.599	2,326.493	2,215.440	6,809.532
21/06/2018-20/07/2018	1,938.642	1,897.964	1,770.167	5,578.739	2,108.732	2,119.276	1,824.442	1,909.729	5,853.447
Subtotal (2018)				**53,478.935**					**57,486.684**
Total (21/08/2012-20/07/2018)				**511,614.573**					**528,144.660**

Table 2 The $EG_{export,y}$ and $EG_{import,y}$,EG_y during the Monitoring Period

Period	Monitoring records	Sales Receipts	$EG_{export,y}$	Monitoring records	Sales Receipts	$EG_{import,y}$	EG_y
	MWh	MWh	MWh	MWh	MWh	MWh	MWh
	C	D	E=min(C,D)	F	G	H=max(F,G)	I=A/(B+A)*E-H
21/08/2012-20/09/2012	7,638.320	7,638.320	7,638.320	18.480	18.480	18.480	3,628.850
21/09/2012-20/10/2012	15,869.380	15,869.380	15,869.380	46.440	46.440	46.440	8,005.850

21/10/2012-20/11/2012	19,736.260	19,736.260	19,736.260	87.860	87.860	87.860	10,023.114
21/11/2012-20/12/2012	19,711.960	19,711.960	19,711.960	123.320	123.320	123.320	9,579.692
21/12/2012-31/12/2012	4,055.583	4,055.583	4,055.583	39.705	39.705	39.705	1,913.555
Subtotal (2012)	**67,011.503**	**67,011.503**	**67,011.503**	**315.805**	**315.805**	**315.805**	**33,151.062**
01/01/2013-20/01/2013	9,463.027	9,463.027	9,463.027	92.645	92.645	92.645	4,106.120
21/01/2013-20/02/2013	7,007.950	7,007.950	7,007.950	106.140	106.140	106.140	3,419.143
21/02/2013-20/03/2013	13,531.010	13,531.010	13,531.010	90.350	90.350	90.350	7,432.890
21/03/2013-20/04/2013	18,679.310	18,679.310	18,679.310	59.630	59.630	59.630	9,500.864
21/04/2013-20/05/2013	18,379.330	18,379.330	18,379.330	30.210	30.210	30.210	9,408.557
21/05/2013-20/06/2013	16,245.700	16,245.700	16,245.700	18.540	18.540	18.540	7,545.304
21/06/2013-20/07/2013	9,101.140	9,101.140	9,101.140	16.150	16.150	16.150	4,027.567
21/07/2013-20/08/2013	10,865.700	10,865.700	10,865.700	16.380	16.380	16.380	5,643.965
21/08/2013-20/09/2013	11,324.860	11,324.860	11,324.860	20.960	20.960	20.960	5,326.431
21/09/2013-20/10/2013	17,588.580	17,588.580	17,588.580	46.440	46.440	46.440	8,607.144
21/10/2013-20/11/2013	19,243.040	19,243.040	19,243.040	98.500	98.500	98.500	9,394.730
21/11/2013-20/12/2013	16,501.820	16,501.820	16,501.820	103.950	103.950	103.950	7,257.807
21/12/2013-31/12/2013	6,140.841	6,140.841	6,140.841	32.004	32.004	32.004	3,297.783

Subtotal (2013)	**174,072.308**	**174,072.308**	**174,072.308**	**731.899**	**731.899**	**731.899**	**84,968.305**
01/01/2014-20/01/2014	14,328.629	14,328.629	14,328.629	74.676	74.676	74.676	7,694.826
21/01/2014-20/02/2014	7,777.310	7,777.310	7,777.310	118.970	118.970	118.970	3,922.778
21/02/2014-20/03/2014	13,516.250	13,516.250	13,516.250	103.900	103.900	103.900	6,928.628
21/03/2014-20/04/2014	15,174.660	15,174.660	15,174.660	37.550	37.550	37.550	7,088.252
21/04/2014-20/05/2014	18,076.020	18,076.020	18,076.020	40.900	40.900	40.900	9,041.699
21/05/2014-20/06/2014	16,856.160	16,856.160	16,856.160	18.240	18.240	18.240	8,610.164
21/06/2014-20/07/2014	10,367.600	10,367.600	10,367.600	17.430	17.430	17.430	5,429.681
21/07/2014-20/08/2014	6,678.450	6,678.450	6,678.450	18.450	18.450	18.450	3,420.557
21/08/2014-20/09/2014	4,315.360	4,315.360	4,315.360	21.380	21.380	21.380	2,375.133
21/09/2014-20/10/2014	12,794.980	12,794.980	12,794.980	45.150	45.150	45.150	6,838.724
21/10/2014-20/11/2014	16,526.290	16,526.290	16,526.290	98.990	98.990	98.990	8,165.932
21/11/2014-20/12/2014	29,322.380	29,322.380	29,322.380	143.670	143.670	143.670	12,969.174
21/12/2014-31/12/2014	6,499.281	6,499.281	6,499.281	33.390	33.390	33.390	3,349.931
Subtotal (2014)	**172,233.370**	**172,233.370**	**172,233.370**	**772.696**	**772.696**	**772.696**	**85,835.479**
01/01/2015-20/01/2015	15,164.989	15,164.989	15,164.989	77.910	77.910	77.910	7,816.505

21/01/2015-20/02/2015	12,887.610	12,887.610	12,887.610	119.750	119.750	119.750	5,870.757
21/02/2015-20/03/2015	16,261.690	16,261.690	16,261.690	113.410	113.410	113.410	8,515.532
21/03/2015-20/04/2015	20,109.840	20,109.840	20,109.840	79.850	79.850	79.850	9,885.340
21/04/2015-20/05/2015	19,973.080	19,973.080	19,973.080	36.520	36.520	36.520	9,553.710
21/05/2015-20/06/2015	15,170.280	15,170.280	15,170.280	21.350	21.350	21.350	7,133.412
21/06/2015-20/07/2015	4,745.380	4,745.380	4,745.380	21.130	21.130	21.130	2,364.430
21/07/2015-20/08/2015	6,974.920	6,974.920	6,974.920	20.330	20.330	20.330	3,173.619
21/08/2015-20/09/2015	6,984.240	6,984.240	6,984.240	27.080	27.080	27.080	3,582.869
21/09/2015-20/10/2015	21,537.110	21,537.110	21,537.110	59.110	59.110	59.110	10,013.604
21/10/2015-20/11/2015	12,842.240	12,842.240	12,842.240	108.180	108.180	108.180	6,109.782
21/11/2015-20/12/2015	14,451.870	14,451.870	14,451.870	139.400	139.400	139.400	6,540.423
21/12/2015-31/12/2015	3,932.676	3,932.676	3,932.676	47.262	47.262	47.262	1,851.058
Subtotal (2015)	**171,035.925**	**171,035.925**	**171,035.925**	**871.282**	**871.282**	**871.282**	**82,411.041**
01/01/2016-20/01/2016	9,176.244	9,176.244	9,176.244	110.278	110.278	110.278	4,319.137
21/01/2016-20/02/2016	13,114.970	13,114.970	13,114.970	142.350	142.350	142.350	6,248.245

21/02/2016-20/03/2016	10,063.410	10,063.410	10,063.410	106.850	106.850	106.850	5,018.626
21/03/2016-20/04/2016	18,021.540	18,021.540	18,021.540	56.730	56.730	56.730	8,785.347
21/04/2016-20/05/2016	19,314.480	19,314.480	19,314.480	33.440	33.440	33.440	9,740.872
21/05/2016-20/06/2016	15,325.420	15,325.420	15,325.420	25.000	25.000	25.000	8,258.999
21/06/2016-20/07/2016	9,390.320	9,390.320	9,390.320	17.220	17.220	17.220	4,481.687
21/07/2016-20/08/2016	6,916.320	6,916.320	6,916.320	21.890	21.890	21.890	3,358.544
21/08/2016-20/09/2016	11,388.160	11,388.160	11,388.160	29.900	29.900	29.900	5,740.326
21/09/2016-31/10/2016	10,112.998	10,112.998	10,112.998	42.940	42.940	42.940	4,882.069
21/10/2016-30/11/2016	16,714.255	16,714.255	16,714.255	94.520	94.520	94.520	8,872.687
21/12/2016-20/12/2016	18,274.736	18,274.736	18,274.736	131.750	131.750	131.750	8,827.453
21/12/2016-31/12/2016	4,506.320	4,506.320	4,506.320	44.907	44.907	44.907	2,095.894
Subtotal (2016)	**162,319.173**	**162,319.172**	**162,319.172**	**857.775**	**857.775**	**857.775**	**80,629.887**
01/01/2017-20/01/2017	10,514.747	10,514.747	10,514.747	104.783	104.783	104.783	4,890.419
21/01/2017-20/02/2017	12,489.944	12,489.944	12,489.944	135.790	135.790	135.790	5,885.066
21/02/2017-20/03/2017	15,998.147	15,998.147	15,998.147	111.850	111.850	111.850	7,037.526

21/03/2017-20/04/2017	18,252.533	18,252.533	18,252.533	63.540	63.540	63.540	9,042.164
21/04/2017-20/05/2017	21,032.996	21,032.996	21,032.996	32.300	32.300	32.300	9,965.118
21/05/2017-20/06/2017	9,849.881	9,849.881	9,849.881	19.540	19.540	19.540	4,035.992
21/06/2017-20/07/2017	7,291.461	7,291.461	7,291.461	18.680	18.680	18.680	3,158.729
21/07/2017-20/08/2017	6,026.600	6,026.600	6,026.600	26.270	26.270	26.270	2,829.818
21/08/2017-20/09/2017	11,703.279	11,703.279	11,703.279	29.860	29.860	29.860	5,444.095
21/09/2017-20/10/2017	8,248.464	8,248.464	8,248.464	67.250	67.250	67.250	4,093.391
21/10/2017-20/11/2017	21,742.113	21,742.113	21,742.113	115.020	115.020	115.020	11,734.081
21/11/2017-20/12/2017	25,896.242	25,896.242	25,896.242	161.190	161.190	161.190	13,067.624
21/12/2017-31/12/2017	5,641.164	5,641.164	5,641.164	52.548	52.548	52.548	2,869.394
Subtotal (2017)	**174,687.571**	**174,687.571**	**174,687.571**	**938.621**	**938.621**	**938.621**	**84,053.416**
01/01/2018-20/01/2018	13,162.716	13,162.716	13,162.716	122.612	122.612	122.612	6,695.252
21/01/2018-20/02/2018	20,406.428	20,406.428	20,406.428	155.960	155.960	155.960	9,053.718
21/02/2018-20/03/2018	15,471.754	15,471.754	15,471.754	108.210	108.210	108.210	7,941.219
21/03/2018-20/04/2018	24,430.690	24,430.690	24,430.690	67.250	67.250	67.250	10,567.367

21/04/2018-20/05/2018	11,689.301	11,689.301	11,689.301	34.120	34.120	34.120	5,894.613
21/05/2018-20/06/2018	13,605.376	13,605.376	13,605.376	30.460	30.460	30.460	6,850.343
21/06/2018-20/07/2018	11,345.702	11,345.702	11,345.702	20.123	20.123	20.123	5,516.413
Subtotal (2018)	**110,111.967**	**110,111.967**	**110,111.967**	**538.735**	**538.735**	**538.735**	**52,518.926**
Total (21/08/2012-20/07/2018)	**1,031,471.817**	**1,031,471.817**	**1,031,471.817**	**5,026.813**	**5,026.813**	**5,026.813**	**503,568.115**

During this monitoring period,

$$EG_y = \frac{\sum_{i=1,2,3} EG_{A-i,y}}{\sum_{i=1,2,3} EG_{A-i,y} + \sum_{i=1,2,3} EG_{B-i,y}} \times EG_{export} - EG_{import} = 503{,}568.115 \text{ MWh}$$

$EF_{grid,CM,y}$ =1.0549 tCO_2e/MWh

Therefore, the baseline emissions $BE_y = EG_y \times EF_{grid,CM,y}$=503,568.115 MWh×1.0549 tCO_2e/MWh =531,211 tCO_2e

5.2 Project Emissions

According to registered PD, the project is a GHG zero-emission electricity generating activity; therefore, no project emissions from the project activity were identified PE_y = 0.

5.3 Leakage

According to registered PD, the project needn't consider leakages, i.e. LE_y=0.

5.4 Net GHG Emission Reductions and Removals

According to the Section 5.1, 5.2 and 5.3 above,

BE_y= 531,211 tCO_2e;

PE_y=0. tCO_2e;

LE_y=0 tCO_2e;

Therefore, $ER_y = BE_y - PE_y - LE_y$ = 531,211 tCO_2e

This monitoring period started from 21/08/2012 to 20/07/2018, with totally 2,160 days. Based on the annual estimated emission reductions from the registered VCS PD, the amount of emission reductions for this monitoring period would be 104,941tCO_2e/365 d×2,160d=621,023tCO_2e. The actual emission reductions in this monitoring period (2,160 days) are 531,211 tCO_2e, which is 14.46% less than the estimation in the registered PD. It is mainly because the wind speed for this monitoring period is lower than other seasons in previous years. So, it is reasonable that during this monitoring period, the actual emission reduction is less than the estimated value.

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)
2012 (21/08/2012~31/12/2012)	34,971	0	0	34,971

2013 (01/01/2013~31/12/2013)	89,633	0	0	89,633
2014 (01/01/2014~31/12/2014)	90,547	0	0	90,547
2015 (01/01/2015~31/12/2015)	86,935	0	0	86,935
2016 (01/01/2016~31/12/2016)	85,056	0	0	85,056
2017 (01/01/2017~31/12/2017)	88,667	0	0	88,667
2018 (01/01/2018~20/07/2018)	55,402	0	0	55,402
Total	**531,211**	**0**	**0**	**531,211**