GUOHUA TONGLIAO KEZUO ZHONGQI PHASE I 49.5 MW WIND FARM PROJECT

Document Prepared by

Guohua Energy Investment Co., Ltd.

Contact Information

Project Title	Guohua Tongliao Kezuo Zhongqi Phase I 49.5 MW Wind Farm Project
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CONTENTS

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The purpose of the report is to calculate the emission reductions generated by Guohua Tongliao Kezuo Zhongqi Phase I 49.5 MW Wind Farm Project (thereafter referred to the project) during the monitoring period (01/11/2018 to 31/07/2022), and to serve as basis for the verification and issuance of corresponding VCUs.

The Project, developed by Guohua (Tongliao) wind Power Co., Ltd, involves construction and operation of a wind power project that is sited the east of Kezuozhong Qi,Tongliao City, Inner Mongolia, P.R. China. The construction start date for the project is 28/06/2007. The first power unit started operation on 16/01/2009, and all the wind turbine generators were put into operation on 13/04/2009. The Project has been registered as a CDM project on 24/02/2011 (UNFCCC registration reference number: 4495).

The total installed capacity of the Project is 49.5MW consisting of 33 sets of wind turbine with unit capacity of 1.5MW. The electricity generated by the Project is delivered to the Northeast China Power Grid (NECPG). The scenario existing prior to the start of the implementation of the project is the same as the baseline scenario, i.e. electricity would have otherwise been generated by the operation of existing power plants connected to NECPG and by the addition of new generation sources of NECPG. After the project is put into operation, the power generated will replace a part of power supply in NECPG which is dominated by fuel-fired power plants and thus reduce greenhouse gas (GHG) emission through avoiding CO_2 emissions produced by NECPG. The estimated annual emission reductions are 111,877 tCO_2e during the first crediting period and 99,459 tCO_2e during the second crediting period.

During this monitoring period (01/11/2018 to 31/07/2022), the monitoring activities were conducted strictly in accordance with the monitoring plan contained in the registered CDM-PDD. The Project has operated without any accidental or emergency events that might impact the accuracy and/or implementation of monitoring activities during this monitoring period. The net power supply during this monitoring period is 333,677.124 MWh. The total emission reductions in this monitoring period (01/11/2018 to 31/07/2022) are 306,564 tCO_2e.

1.2 Sectoral Scope and Project Type

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

Project type: Grid-connected wind power project.

The project is not a grouped project.

1.3 Project Proponent

Organization name	Guohua (Tongliao) wind Power Co., Ltd
Contact person	Mr. Hu Weiping
Title	Project manager
Address	No. 3 of Dongzhimen South Street, Dongcheng District, Beijing
Telephone	010-58151719
Email	20005222@ceic.com

1.4 Other Entities Involved in the Project

Organization name	N/A
Role in the Project	N/A
Contact person	N/A
Title	N/A
Address	N/A
Telephone	N/A
Email	N/A

1.5 Project Start Date

16/01/2009, on which the VCS project began reducing GHG emissions.

1.6 Project Crediting Period

First crediting period:

16/01/2009 - 15/01/2019 which covers 10 years.

Section crediting period:

16/01/2019 - 15/01/2029 which covers 10 years.

There is a deviation for the crediting period. The project is registered under VCS Standard 3 and completed validation before 19/03/2020, thus it remains eligible to apply the crediting period requirements under VCS Version 3 which shall be a maximum of ten years and may be renewed at most twice, so the first renewable crediting period of the project shall be updated from

16/01/2009-23/02/2011 to 16/01/2009 - 15/01/2019. However the project lifetime is 20 years according to the section B.5 of the registered PDD. Therefore the project crediting life would be 16/01/2009 – 15/01/2029.

1.7 Project Location

The Project is located the east of Kezuozhong Qi,Tongliao City, Inner Mongolia, P.R. China, and the geographical coordinates are 122° 57'east longitude and 41° 13' north latitude.

1.8 Title and Reference of Methodology

Approved consolidated baseline and monitoring methodology ACM0002.version 11.0-"Consolidated methodology for grid-connected electricity generation from renewable sources" and version 20.0 (2nd crediting period)-"Grid-connected electricity generation from renewable sources"

The methodology also refers to the approved versions for the following tools:

- Tool for the demonstration and assessment of additionality version 05.2;
- Tool to calculate the emission factor for an electricity system version 02 (1st crediting period) and version 7.0 (2nd crediting period)

Reference:

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

1.9 Participation under other GHG Programs

The Project was registered as a CDM project on 24/02/2011 (Ref. 4495). The first CDM crediting period is from 24/02/2011 to 23/02/2018. CERs of 120,990 tCO_2e have been issued for the monitoring periods from 24/02/2011 to 31/12/2012. The emission reductions during this monitoring period (01/11/2018 to 31/07/2022) will only apply for issuance under VCS, which is ensured by the statement that the PP will not request the issuance of CERs under CDM and the VCUs will not be double counted.

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO_2e/year, not including renewable project[1].

[1] http://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html

Thus, the project proponent: Guohua (Tongliao) wind Power Co., Ltd as an enterprise for renewable energy investment, is not included in the compliance entity list by China national Emission Trading Scheme (ETS). Moreover, the project has not been registered as a CCER (Chinese Certified Emission Reductions) project in China, thus it is not eligible for emission reductions transaction under the China's ETS.

Therefore, 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. The net GHG emission reductions generated during this monitoring period have not been used for compliance under such programs or mechanisms. Furthermore, a statement on no double counting will be submitted to Verra to confirm the credits during this monitoring period has not been counted and will not be counted under emission trading programs and other binding limits.

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 Contributions

The Project activity will not only supply renewable electricity to grid, but also contribute to sustainable development of the local community, which mainly include the following:

- The project utilizes wind resources to generate and supplied 333,677.124MWh renewable electricity to the power grid during this monitoring period, which contributes to SDG 7.
- The project provides 13 long-term job opportunities for local residents during this monitoring period, which has a positive effect on the local economy which contributes to SDG 8.
- The project utilizes zero-emission wind power to supply electricity to the grid, and reduces 306,564 tCO_2e of GHG emissions during this monitoring period, which contributes to SDG 13.

For evidence of SDGs, please refer to Appendix 1 for details.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	The project has provided 333,677.124 MWh renewable energy generation during this monitoring period.	This is the first time to report sustainable development contributions of the project. The project has provided 333,677.124 MWh renewable energy generation accumulated at the end of this monitoring period.

<table>
<tr>
<td>2)</td>
<td>8.5</td>
<td>8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities</td>
<td>Implemented activities to increase</td>
<td>The project has employed 13 persons including 9 men and 4 women during this monitoring period with yearly average salary higher than the local average salary of the respective years[2].
<table>
<tr><th>Year</th><th>Average yearly salary of the project (CNY)</th><th>Local average salary (CNY)</th></tr>
<tr><td>2018</td><td>106,443</td><td>75,601</td></tr>
<tr><td>2019</td><td>110,434</td><td>83,277</td></tr>
<tr><td>2020</td><td>116,934</td><td>87,916</td></tr>
<tr><td>2021</td><td>123,862</td><td>93,266</td></tr>
</table>
</td>
<td>Employed about 13 persons yearly.</td>
</tr>
<tr>
<td>3)</td>
<td>13.0</td>
<td>Tonnes of greenhouse gas emissions avoided or removed</td>
<td>Implemented activities to increase</td>
<td>By supplying 333,677.124 MWh renewable energy to the grid, the project has prevented the release of 306,564 tonnes of carbon into the atmosphere during the monitoring period.</td>
<td>This is the first time to report sustainable development contributions of the project. the project prevented the release of 306,564 tonnes of carbon into the atmosphere accumulated at the end of this monitoring period.</td>
</tr>
</table>

[2] http://tj.nmg.gov.cn/files_pub/content/PAGEPACK/cd1ebd873e844e50844846b25256a59b/zk/indexch.htm

2 SAFEGUARDS

2.1 No Net Harm

In accordance with relevant laws and regulations on environmental protection, an Environmental Impact Assessment (EIA) of the proposed project has been implemented. The results of the EIA have been approved by the Environmental Protection Bureau of Inner Mongolia.

The EIA has assessed every possible aspect of environmental impacts of the project and recommended corresponding measures, where applicable. The environmental impacts and corresponding mitigation measures during operation have been discussed in the registered CDM-PDD. No negative environmental impacts haven been identified.

Furthermore, the project makes positive contributions to the sustainable development as described in section 1.11 of this report e.g., providing job opportunities and clean energy to the local community, and mitigating GHG emissions.

In conclusion, construction and operation of the project does not cause any negative environmental nor socio-economic impacts.

2.2 Local Stakeholder Consultation

LSC prior to the project implementation

A public survey was conducted on 25/03/2007 by the project owner. Questionnaires were distributed to the stakeholders in the directly affected area, requesting comments on the proposed project construction. As there are few people living around the wind farm project site, 27 copies of questionnaire were distributed and 27 copies of the questionnaire were returned. From the comments above, it can be concluded most representatives think the proposed project will do good to local environment and economy and all support it.

LSC during the operation period

During this monitoring period, the project carried out the communication with local stakeholders in line with the on-going communication mechanism, i.e.,

The project owner published the contact information of the contact person who is responsible for stakeholders' comments to the local government and residents. Stakeholders were informed of the contact information, and their comments can be directly collected by the contact person. The comments would be fed back to the stakeholders by the contact person for a timely response. Besides, the contact person of project owner also meets local villagers to collect their comments and suggestions at least yearly. Actually the contact person met local villagers to collect their comments and suggestions respectively in May 2018, May 2019, June 2020, June 2021 and May 2022. Once the contact person received negative comments from the stakeholders, the contact person would record the negative comments and the feedback. The local authority also conducts spot checks on the implementation of the project at periodic intervals as per relevant regulations.

In line with VCS requirements all the processed have been implemented to receive comments from local stakeholders as well as communicate with them. By the end of this monitoring period, the project did not receive any negative comments nor grievance from the stakeholders.

2.3 AFOLU-Specific Safeguards

The project is a non-AFOLU project, and this section is not required.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The total installed capacity of the Project is 49.5MW consisting of 33 sets of wind turbine with unit capacity of 1.5MW. See Table 2 below for key technical specifications.

Table 2. Major technical parameters of the key equipments of the Project

No.	Item	Unit	Value
1	type	/	FD-77-1500
2	Installed capacity	MW	49.5
3	Rated capacity	kW	1500
4	Annual Operation hour	Hour	2199
5	Annual grid-connected output	MWh	108830
6	Rotor Diameter	m	77
7	Number of blades	/	3
8	Swept area	m^2	4657
9	Rated Rotation speed of wind wheel	rpm	9.6~17.3 ±10%
10	Cut-in wind speed	m/s	3.5
11	Cut-out wind speed	m/s	20
12	Rated wind speed	m/s	12.5
13	Hub height of the wind turbines	m	70
14	Rated voltage of generator	v	690
15	Lifetime of the wind turbine	Year	21
16	Plant Load Factor	%	25.1

No abnormal circumstance occurred during this monitoring period. There is no event or situation occurred during the monitoring period, which may impact the applicability of the methodology and may impact the GHG emission reductions or removals and monitoring. The project was operational as normal during the monitoring period.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation exists.

3.2.2 Project Description Deviations

There is a deviation for the crediting period. The project is registered under VCS Standard 3 and completed validation before 19/03/2020, thus it remains eligible to apply the crediting period requirements under VCS Version 3 which shall be a maximum of ten years and may be renewed at most twice, so the first renewable crediting period of the project shall be updated from 16/01/2009-23/02/2011 to 16/01/2009 - 15/01/2019. However the project lifetime is 20 years according to the section B.5 of the registered PDD. Therefore the project crediting life would be 16/01/2009 – 15/01/2029. This deviation is related to the change on the duration of the crediting period, which does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario. This deviation has been validated during the renewal of the crediting period.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	The combined margin grid emission factor of the Northeast China Power Grid where the Project connected to
Source of data	Registered CDM-PDD
Value applied	1.0280 in the first crediting period 0.9139 in the second crediting period
Justification of choice of data or description of measurement methods and procedures applied	Determined ex-ante and fixed for the 1st crediting period and 2nd crediting period respectively
Purpose of Data	Calculation of baseline emissions.
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{Total,y}$
Data unit	MWh
Description	The total net electricity supplied to the NECPG by "P" and "X" in year y
Source of data	Electricity meter reading of main electricity meter
Description of measurement methods and procedures to be applied	Main meter M with the backup meter (bidirectional meters) are installed in the 220kV substation to monitor the value of the total electricity of projects exported to the grid ($EG_{export,y}$) and the value of the total electricity of projects imported from the grid ($EG_{import,y}$). The readings of the electricity meter will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup. The accuracy of electricity meters is 0.2S, in line with relevant national standard. The calibration frequency is once a year.
Frequency of monitoring/recording	Monthly recorded and aggregated
Value monitored	2,199,571.439
Monitoring equipment	See table below
QA/QC procedures to be applied	Meters have been properly calibrated annually according to the requirement from Technical administrative code of electric energy metering (national standard reference: DL/T448), and in compliance with the requirement of monitoring plan.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	$E_{p,y}$
Data unit	MWh
Description	Electricity generation by project "P" in year y
Source of data	Measured by electricity meter M1
Description of measurement methods and procedures to be applied	Continuously measured by one bi-directional meter M1 installed at the Project Site and monthly recorded.
Frequency of monitoring/recording	Monthly recorded and aggregated

Value monitored	341,420.893
Monitoring equipment	See table below
QA/QC procedures to be applied	Meters have been properly calibrated annually according to the requirement from Technical administrative code of electric energy metering (national standard reference: DL/T448), and in compliance with the requirement of monitoring plan. Meter readings are crosschecked with sales receipts.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	$E_{x,y}$
Data unit	MWh
Description	Electricity generation by Project X in the year y, consist of electricity generation by projects including “2”, “3”, “4”, “5”, and “6”in the year y
Source of data	Electricity meter reading
Description of measurement methods and procedures to be applied	Continuously measured by one bi-directional meter installed at the Project Site and monthly recorded. $E_{2,y}$ is the electricity export to the NECPG by the project “2” owned by the same project owner in year y, measured by on-site meter M2; $E_{3,y}$ is the electricity export to the NECPG by the project “3” owned by the same project owner in year y, measured by on-site meter M3; $E_{4,y}$ is the electricity export to the NECPG by the project “4” owned by the same project owner in year y, measured by on-site meter M4. $E_{5,y}$ is the electricity export to the NECPG by the project “5” owned by the same project owner in year y, measured by on-site meter M5. $E_{6,y}$ is the electricity export to the NECPG by the project “6” owned by the same project owner in year y, measured by on-site meter M6.
Frequency of monitoring/recording	Monthly recorded and aggregated
Value monitored	See the Table 5
Monitoring equipment	See table below
QA/QC procedures to be applied	Meters have been properly calibrated annually according to the requirement from Technical administrative code of electric energy metering (national standard reference: DL/T448), and in compliance with the requirement of monitoring plan. Meter readings are crosschecked with sales receipts.
Purpose of the data	Calculation of baseline emissions
Calculation method	-

Comments	-

Table 3 Information of meters

Meter	Type	Serial No.	Accuracy	Calibration date	Valid till	Calibrator
Main meter M	Electricity meter	95173915	0.2S	24/10/2018	23/10/2019	Electricity research institute of Inner Mongolia
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
Backup meter of main meter M	Electricity meter	95173914	0.2S	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M1	Electricity meter	09030048740091	0.5	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M2	Electricity meter	09030048740098	0.5	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M3	Electricity meter	10110473910122	0.5S	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M4	Electricity meter	12058075000500	0.2S	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M5	Electricity meter	10050267430264	0.5S	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	
M6	Electricity meter	10050267430258	0.5S	24/10/2018	23/10/2019	
				21/10/2019	20/10/2020	
				08/10/2020	07/10/2021	
				28/09/2021	27/09/2022	

4.3 Monitoring Plan

1. The user---Who use the monitoring plan

The proposed 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. This plan should be modified according to actual conditions and requirements of DOE/VVB in order to ensure that the monitoring is credible, transparent and conservative.

2. Operational and management structure for monitoring

The monitoring of the emission reductions will be carried out according to Figure below.

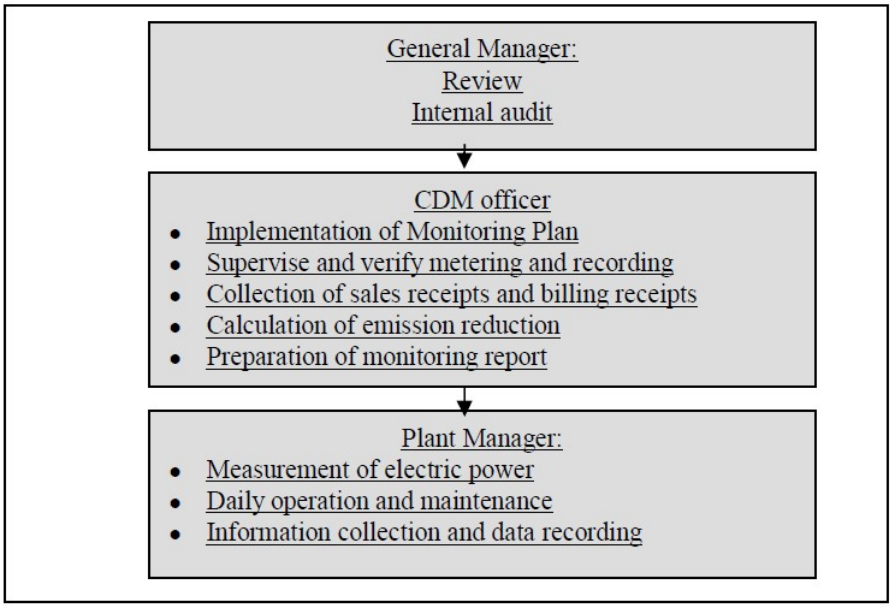

Figure 2 The Personal structure if the project monitoring

Plant manager of wind farm is responsible to record and collect the information and data required by the Monitoring Plan. The required information and data will be documented and sent to the officer monthly. The officer works out the monitoring plan, charges of its implementation and reports to the General Manager of the company. The General Manager of the company will make the confirmations on monitoring calculation data and reports. The project owner will train relevant staffs of the wind power plant for data monitoring and data management. The training contains operational regulations, quality control (QC) standard, data monitoring and data management etc.

3. Monitoring Equipment

The main meter and back-up meter (M) installed in the substation is bidirectional, recording the electricity of "P" and "X" exported to the grid ($EG_{export,y}$) and imported from the grid ($EG_{import,y}$), which is used to calculate the $EG_{Total,y} = EG_{export,y} - EG_{import,y}$. They will be owned, operated and maintained by the grid company. The reading records are provided to the project owner by the grid company regularly, and can be crosschecked by sales receipts. The Meter 1 and Meter X are installed at lower side of the onsite 220kV transformers, which are used to monitor the electricity generation of "P"($E_{P,y}$) and "X"($E_{X,y}$). The on-site meters are owned, operated and maintained by the project owner. The location of those meters is presented in following figure:

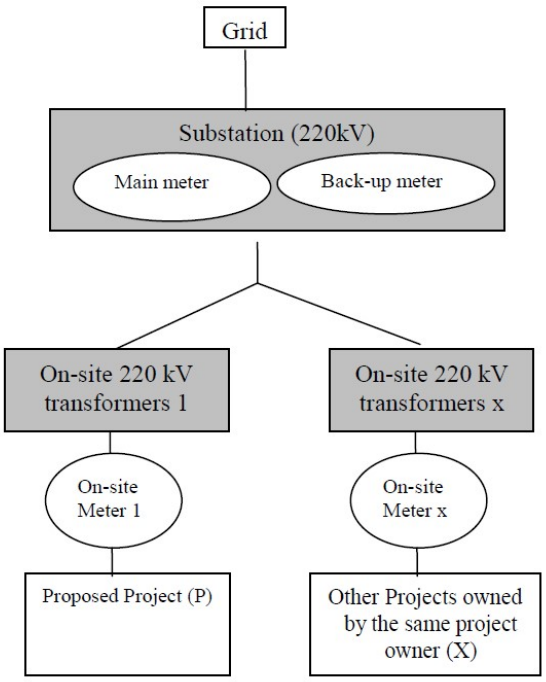

Figure 2 Meter Location

Note: X here stands for different on site meters for the corresponding projects owned by the same project owner. Each project matches with an on-site 220KV transformers.

As mentioned above, $EG_{expoert,y}$ and $EG_{expoert,y}$ were recorded by the main meter installed at the station. The net electricity supply by "P" and "X" ($EG_{total,y}$) is the difference between $EG_{expoert,y}$ and $EG_{expoert,y}$, i.e.

$$EG_{total,y} = EG_{export,y} - EG_{import,y}$$

As demonstrated in the registered monitoring Plan, since the "P" and "X" share the same main meter, the separate net electricity supply for each project cannot be obtained from the main meter; therefore the on-site meters can be used to calculate the share of the net supply to the grid by each project. The net electricity supplied from "P"($EG_{P,y}$) can now be calculated as follows:

$$EG_{p,y} = EG_{Total,y} \times E_{P,y} / (E_{P,y} + E_{X,y})$$

Where:

$EG_{P,y}$ is the calculated net electricity supplied from "P" in year y;

$EG_{total,y}$ is the total net electricity supplied to the NECPG by "P"and "X" in year y, read by the main meter.

$E_{X,y}$ is the electricity exported by the other projects owned by the same project owner in year y, read by on-site meter x;

$E_{P,y}$ is the electricity exported by the project in year y, read by on-site meter 1.

The calculated net electricity supplied from "P" ($EG_{P,y}$) is therefore used for the emission reduction calculations.

This approach is flexible to accommodate potential future installations which also share the same main meter with "P".

4. Monitoring Procedures

The project owner and the grid company are responsible for maintenance, calibration and monitoring of the on-site meters and the main meter respectively. The procedures of monitoring the electricity are summarized as follows:

1) At fixed time on a particular day, generally the last day, of each month, the gird company should read and record data from the main meter and together with the project owner read and record data form on-site meters installed in each project site and then check the reading of the main meter against the on-site meters.
2) The grid company provides the project owner with the monthly records of $EG_{total\ y.}$
3) The sales receipts are used for cross check purpose.
4) The project owner carries out an internal audit on the readings, grid data and calculations, and report to DOE/VVB for verification.

Should any previous months reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the net energy output shall be determined by:

(a) first, by reading backup meter installed, unless a test by either party reveals it is inaccurate;

(b) if the backup system is not within acceptable limits of accuracy or is otherwise performing improperly the developer and grid company shall jointly prepare an estimate of the correct reading;

(c) if the grid company and the developer fail to agree then the matter will be referred for arbitration according to agreed procedures.

5. Calibration of Meters &Metering

An agreement should be signed between the project owner and the grid company that defines the metering arrangements and the required quality control procedures to ensure accuracy. The metering equipment will be properly calibrated and checked annually for accuracy.

1) The metering equipment shall have sufficient accuracy so that error resulting from such equipment shall not exceed +0.5% of full-scale rating. 2) All the meters installed shall be tested within 10 days after:

(a) The detection of a difference larger than the allowable error in the reading of both meters

(b) The repair of all or part of the meter caused by the failure of one or more parts to operate in accordance with the specifications.

Calibration is carried out with the records being provided to the project owner, and these records will be maintained by the project owner.

6. Quality Assurance and Quality Control

The quality assurance and quality control procedures for recording, maintaining and archiving data shall be improved as part of this carbon project activity. This is an on-going process which will be ensured through the VCS mechanism in terms of the need for verification of the emissions on an annual basis according to this PDD.

7. Data Management

This provides information on record keeping of the data collected during monitoring. Record keeping is the most important exercise in relation to the monitoring process. Without accurate and efficient record keeping, project emission reductions cannot be verified. Below follows an outline of how project related records would be managed.

Overall responsibility for monitoring of GHG emissions reduction will rest with the responsible person of the project. The ER monitoring manual sets out the procedures for 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.

Data will be archived at the end of each month using electronic spreadsheets and will be stored on hard disk. Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated in a central place, together with this monitoring plan. In order to facilitate the auditor's reference, monitoring results will be indexed. All paper-based information will be stored by the project owner and kept at least one copy. And all data including calibration records is kept until 2 years after the end of the total crediting period of the CDM project.

8. Emergency plan

If one meter is inaccurate by detecting errors larger than the allowable limit, or functions improperly, this meter will be changed with a new meter. The net electricity supplied from "P"($EG_{P,y}$) during the malfunction period shall be counted as zero.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per the registered PD, the baseline emission of the project is calculated as below:

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

Table 4 Baseline emissions calculation

Year	$EG_{P,y}$	$EF_{grid,CM,y}$	BE_y
	MWh	tCO_2e/MWh	tCO_2e
1st crediting period			
2018 (01/11/2018 to 31/12/2018)	11,181.404	1.0280	11,494
2019 (01/01/2019 to 15/01/2019)	3,008.186	1.0280	3,092
Total in 1st crediting period	14,189.590	1.0280	14,586
2nd crediting period			
2019 (16/01/2019 to 31/12/2019)	77,902.701	0.9139	71,195
2020 (10/12/2020 to 31/12/2020)	94,201.461	0.9139	86,090
2021 (01/01/2021 to 31/12/2021)	96,154.366	0.9139	87,875
2022 (01/01/2022 to 31/07/2022)	51,229.006	0.9139	46,818
Total in 2nd crediting period	319,487.534	0.9139	291,978
Total	333,677.124	/	306,564

The monitored monthly electricity data is shown in the tables below:

Table 5 Monitoring results (MWh)

Period start	Period end	$EG_{total,y}$			$E_{P,y}$	$E_{X,y}$						$EG_{P,y}$ Net electricity supplied from the project
		$EG_{export,y}$	$EG_{import,y}$	$EG_{total,y}=EG_{export,y}-EG_{export,y}$		$E_{2,y}$	$E_{3,y}$	$E_{4,y}$	$E_{5,y}$	$E_{6,y}$	Total	
1st crediting period												
01/11/2018	30/11/2018	42,006.096	100.320	41,905.776	5,078.804	6,577.926	7,319.713	5,696.720	9,629.002	8,568.571	37,791.932	4,964.487
01/12/2018	31/12/2018	50,211.216	116.160	50,095.056	6,362.152	7,234.872	9,112.664	5,833.032	11,421.716	11,300.905	44,903.189	6,216.917
Subtotal 2018		-	-	92,000.832	11,440.956	-	-	-	-	-	82,695.121	11,181.404
01/01/2019	15/01/2019	24,295.750	56.206	24,239.544	3,078.461	3,500.745	4,409.354	2,822.435	5,526.637	5,468.180	21,727.351	3,008.186
Subtotal 2019		-	-	24,239.544	3,078.461	-	-	-	-	-	21,727.351	3,008.186
Total in 1st crediting period		-	-	116,240.376	14,519.417	-	-	-	-	-	104,422.472	14,189.590
2nd crediting period												
16/01/2019	31/01/2019	32,227.706	48.866	32,178.840	4,755.381	5,193.091	5,178.700	4,015.386	7,349.352	6,412.212	28,148.741	4,650.562
01/02/2019	28/02/2019	39,434.736	87.648	39,347.088	5,240.851	5,810.127	6,251.296	5,671.840	8,711.370	8,653.394	35,098.027	5,111.997
01/03/2019	31/03/2019	50,670.048	88.176	50,581.872	6,972.999	7,581.019	8,237.114	7,363.546	11,021.306	10,559.204	44,762.189	6,817.552
01/04/2019	30/04/2019	47,691.072	81.312	47,609.760	7,419.542	7,679.433	7,134.476	6,461.413	10,730.278	9,266.005	41,271.605	7,254.761
01/05/2019	31/05/2019	64,447.680	39.072	64,408.608	10,810.878	9,075.339	10,538.825	7,108.742	14,898.040	13,261.265	54,882.211	10,599.496
01/06/2019	30/06/2019	37,208.688	118.272	37,090.416	6,495.633	4,646.685	6,646.083	4,051.393	8,442.910	7,680.355	31,467.426	6,346.320
01/07/2019	31/07/2019	24,730.992	116.160	24,614.832	4,399.801	3,058.199	4,377.460	2,691.689	5,667.160	5,008.282	20,802.790	4,297.192
01/08/2019	31/08/2019	27,308.688	124.080	27,184.608	4,036.295	3,997.245	4,825.384	3,579.008	6,147.384	5,602.760	24,151.781	3,892.607
01/09/2019	30/09/2019	36,428.832	124.608	36,304.224	5,662.502	4,973.324	6,012.891	4,784.411	8,155.597	7,550.408	31,476.631	5,535.206
01/10/2019	31/10/2019	56,619.024	60.720	56,558.304	8,486.546	7,848.831	8,457.698	8,121.170	12,923.398	11,876.104	49,227.201	8,316.643
01/11/2019	30/11/2019	60,170.352	78.144	60,092.208	9,221.512	9,247.249	9,754.026	9,170.047	12,557.324	11,415.209	52,143.855	9,030.192
01/12/2019	31/12/2019	45,497.760	112.464	45,385.296	6,204.630	6,900.885	7,346.861	6,747.891	10,061.974	9,281.715	40,339.326	6,050.173
Subtotal 2019		-	-	521,356.056	79,706.570	-	-	-	-	-	453,771.783	77,902.701
01/01/2020	31/01/2020	34,916.640	176.880	34,739.760	5,073.431	4,854.545	5,575.682	4,993.682	7,849.431	7,444.449	30,717.789	4,924.386
01/02/2020	29/02/2020	48,062.786	162.099	47,900.687	5,695.016	5,996.199	6,689.625	5,734.045	9,492.045	15,494.021	43,405.935	5,555.802
01/03/2020	31/03/2020	77,504.064	64.416	77,439.648	9,968.135	12,325.840	12,426.233	11,466.409	17,862.852	14,948.875	69,030.209	9,771.456
01/04/2020	30/04/2020	52,582.992	56.496	52,526.496	8,290.848	7,261.737	8,381.343	7,512.865	12,263.380	9,968.013	45,387.338	8,112.964
01/05/2020	31/05/2020	64,052.208	74.976	63,977.232	10,792.497	9,440.995	9,459.943	8,804.413	14,239.732	12,534.699	54,479.782	10,578.366
01/06/2020	30/06/2020	43,668.240	96.096	43,572.144	7,306.422	6,203.785	6,592.351	5,671.269	9,799.791	8,944.705	37,211.901	7,151.134

01/07/2020	31/07/2020	27,911.664	137.808	27,773.856	5,016.869	3,572.047	5,135.647	3,584.210	6,126.692	5,159.649	23,578.245	4,872.783
01/08/2020	31/08/2020	23,141.712	111.408	23,030.304	4,640.465	3,192.249	3,824.870	2,949.038	4,892.900	4,174.899	19,033.956	4,514.210
01/09/2020	30/09/2020	54,803.760	151.008	54,652.752	8,526.418	8,455.437	9,396.031	7,920.378	11,372.880	10,213.626	47,358.352	8,338.447
01/10/2020	31/10/2020	66,201.696	55.968	66,145.728	9,987.932	9,820.228	10,874.790	9,230.594	14,333.693	13,289.254	57,548.559	9,782.253
01/11/2020	30/11/2020	69,484.800	48.576	69,436.224	10,824.736	10,314.563	11,133.552	10,169.772	14,784.083	13,663.102	60,065.072	10,602.777
01/12/2020	31/12/2020	66,289.872	54.384	66,235.488	10,209.645	9,547.612	11,166.358	9,666.668	14,108.922	12,945.961	57,435.521	9,996.883
Subtotal 2020		-	-	627,430.319	96,332.414	-	-	-	-	-	545,252.659	94,201.461
01/01/2021	31/01/2021	56,163.888	119.328	56,044.560	8,200.633	7,810.937	8,590.329	8,132.196	12,471.582	12,235.103	49,240.147	8,001.299
01/02/2021	28/02/2021	63,075.408	84.480	62,990.928	9,925.998	9,557.226	10,373.385	9,016.798	13,053.346	12,595.245	54,596.000	9,690.460
01/03/2021	31/03/2021	69,990.096	91.872	69,898.224	11,482.530	10,520.442	11,398.253	9,908.745	14,340.263	13,523.732	59,691.435	11,276.714
01/04/2021	30/04/2021	72,083.616	66.528	72,017.088	12,051.522	10,472.367	11,473.194	10,242.168	15,452.673	13,878.447	61,518.849	11,797.080
01/05/2021	31/05/2021	59,215.200	94.512	59,120.688	9,744.722	8,899.714	9,758.297	7,321.973	12,698.063	11,271.205	49,949.252	9,651.136
01/06/2021	30/06/2021	46,006.224	88.176	45,918.048	7,545.388	6,602.811	7,850.247	6,183.419	9,931.171	8,948.991	39,516.639	7,361.975
01/07/2021	31/07/2021	37,573.536	191.136	37,382.400	6,551.064	5,145.546	6,126.013	5,126.883	8,289.543	7,185.984	31,873.969	6,373.306
01/08/2021	31/08/2021	25,356.144	118.800	25,237.344	4,220.790	3,206.671	4,542.617	3,631.719	5,428.113	4,944.306	21,753.426	4,101.049
01/09/2021	30/09/2021	30,282.912	155.232	30,127.680	4,859.351	3,904.055	5,569.747	4,315.812	6,469.695	5,852.802	26,112.111	4,726.964
01/10/2021	31/10/2021	43,877.328	99.792	43,777.536	6,869.213	5,775.343	7,835.541	6,013.460	9,429.086	8,885.874	37,939.304	6,711.162
01/11/2021	30/11/2021	56,065.680	109.824	55,955.856	8,254.935	8,268.508	9,739.347	7,850.811	11,979.207	11,164.960	49,002.833	8,067.236
01/12/2021	31/12/2021	54,024.960	127.248	53,897.712	8,606.167	7,210.270	9,690.141	7,239.112	11,723.022	10,778.257	46,640.802	8,395.985
Subtotal 2021		-	-	612,368.064	98,312.313	-	-	-	-	-	527,834.767	96,154.366
01/01/2022	31/01/2022	34,410.288	262.944	34,147.344	5,385.928	4,801.945	5,866.403	4,528.476	7,668.076	7,119.438	29,984.338	5,199.710
01/02/2022	28/02/2022	43568.448	86.064	43,482.384	6374.595	6241.111	7340.362	5973.301	9825.779	8933.567	38,314.120	6,202.519
01/03/2022	31/03/2022	60495.072	108.768	60,386.304	10134.419	7875.695	10815.12	7949.79	13567.427	11527.672	51,735.704	9,891.367
01/04/2022	30/04/2022	66523.776	69.696	66,454.080	11143.45	10411.283	10916.08	9205.707	13761.637	12472.437	56,767.144	10,904.451
01/05/2022	31/05/2022	60691.488	74.448	60,617.040	9911.008	8416.693	10704.83	8333.55	12790.599	11762.721	52,008.393	9,702.548
01/06/2022	30/06/2022	31890.144	154.176	31,735.968	5465.108	4466.542	5770.535	4361.342	6698.463	5796.823	27,093.705	5,326.991
01/07/2022	31/07/2022	25567.872	214.368	25,353.504	4135.671	3645.009	4498.216	3696.479	5444.963	4783.797	22,068.464	4,001.420
Subtotal 2022		-	-	322,176.624	52,550.179	-	-	-	-	-	277,971.868	51,229.006
Total in 2nd crediting period		-	-	2,083,331.063	326,901.476	-	-	-	-	-	1,804,831.077	319,487.534
Total		-	-	2,199,571.439	341,420.893	-	-	-	-	-	1,909,253.549	333,677.124

Note: During this monitoring period, the data of electricity between Meter Reading Records and Sales receipts is consistent.

5.2 Project Emissions

As per the methodology and the registered CDM-PDD, the project emission is 0.

5.3 Leakage

As per the methodology and the registered CDM-PDD, the leakage is 0.

5.4 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)
1st crediting period				
2018 (01/11/2018 to 31/12/2018)	11,494	0	0	11,494
2019 (01/01/2019 to 15/01/2019)	3,092	0	0	3,092
Total in 1st crediting period	14,586	0	0	14,586
2nd crediting period				
2019 (16/01/2019 to 31/12/2019)	71,195	0	0	71,195
2020 (10/12/2020 to 31/12/2020)	86,090	0	0	86,090
2021 (01/01/2021 to 31/12/2021)	87,875	0	0	87,875
2022 (01/01/2022 to 31/07/2022)	46,818	0	0	46,818
Total in 2nd crediting period	291,978	0	0	291,978
Total	306,564	0	0	306,564

Comparison of the actual emission reductions with the estimated values of this monitoring period is analysed as follows:

1st crediting period:

Annual estimated emission reductions are 111,877 tCO_2e

Total days during this monitoring period are 76 days

Calculated estimation of the emission reductions: 111,877 * 76 / 365 = 23,295 tCO_2e

The actual emission reductions achieved during this monitoring period are 37.39% lower than the estimated ex-ante amount.

2nd crediting period:

Annual estimated emission reductions are 99,459 tCO_2e

Total days during this monitoring period are 1293 days

Calculated estimation of the emission reductions: 99,459 * 1293 / 365 = 352,330 tCO_2e

The actual emission reductions achieved during this monitoring period are 17.13% lower than the estimated ex-ante amount.