



**Monitoring report form
(Version 1.0)**

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	Salkhit Wind Farm	
UNFCCC reference number of the project activity	5977	
Version number of the monitoring report	1	
Completion date of the monitoring report	03/06/2015	
Monitoring period number and duration of this monitoring period	Monitoring period #3: 01/07/2014 – 31/12/2014	
Project participant(s)	Clean Energy LLC Swedish Energy Agency	
Host Party	Mongolia	
Sectoral scope(s)	Sectoral scope: 01 Energy industries	
Selected methodology(ies)	Applied methodology: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 12.1.0	
Selected standardized baseline(s)	Not applicable	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	90,123 tCO ₂	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0 tCO ₂	64,430 tCO ₂

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>> The objective of the Salkhit Wind Farm (hereinafter referred as Project) is to generate renewable electricity using wind power resources and supply it to the Central Electricity System (Network or the Grid) to meet the growing electricity demand under the long-term Power Purchase Agreement (PPA). It is the first grid connected wind farm in Mongolia. The Project reduces generate greenhouse gas (GHG) emissions by avoiding CO₂ emissions from electricity generation from fossil fuel power plants that is supplied to the Grid. Clean Energy (CE) is the Project developer and operator.

The specific goals of the Project are to:

- generate clean electricity, reduce GHG emissions and contribute to reduction of air pollutants (SO₂, NO_x, PM) by saving coal and water consumption compared to business-as-usual scenario;
- introduce wind power in Mongolia and help to stimulate the implementation of other renewable energy sources being the first grid-connected renewable energy source;
- introduce private sector investment in renewable energy sector and pave the path for future projects being the first independent power producer with the first private sector investment in the country;
- create local employment opportunity during Project development, construction and operation phases and create local expertise for future projects.

The 49.6 MW Salkhit Wind Project is comprised of 31 wind turbine generators from General Electric (GE) each with an installed capacity of 1.6 MW. The expected total annual net electricity generation of the Salkhit wind farm is 168.5 GWh with an annual emission reduction of 178,778 tonnes of CO₂ equivalent (tCO₂e).

The commercial operation date is 25 June 2013 with all turbines commissioned as of 19 Jul 2013 (though the start of the crediting period was updated as 24 June 2013). Construction lasted 2 years since 2011 (early civil works started in June 2011 while construction and erection work started in Apr 2012 as described in Table 1).

Table 1. Relevant Dates for the Project

Project start date as per the PDD	31/05/2011
Start of construction (early civil works)	06/2011
Registration date	30/03/2012
Construction and erection work	04/2012
Start of the crediting period	24/06/2013
Start of commercial operation	25/06/2013
All turbines commissioned	19/07/2013

The actual net electricity supply to the Grid from 01 Jul 2014 to 31 Dec 2014 was 60,726,468 kWh. The corresponding GHG emission reduction was 64,430 tCO₂ during this period. The operations summary is attached in Appendix 1.

A.2. Location of project activity

>> Host Party: Mongolia

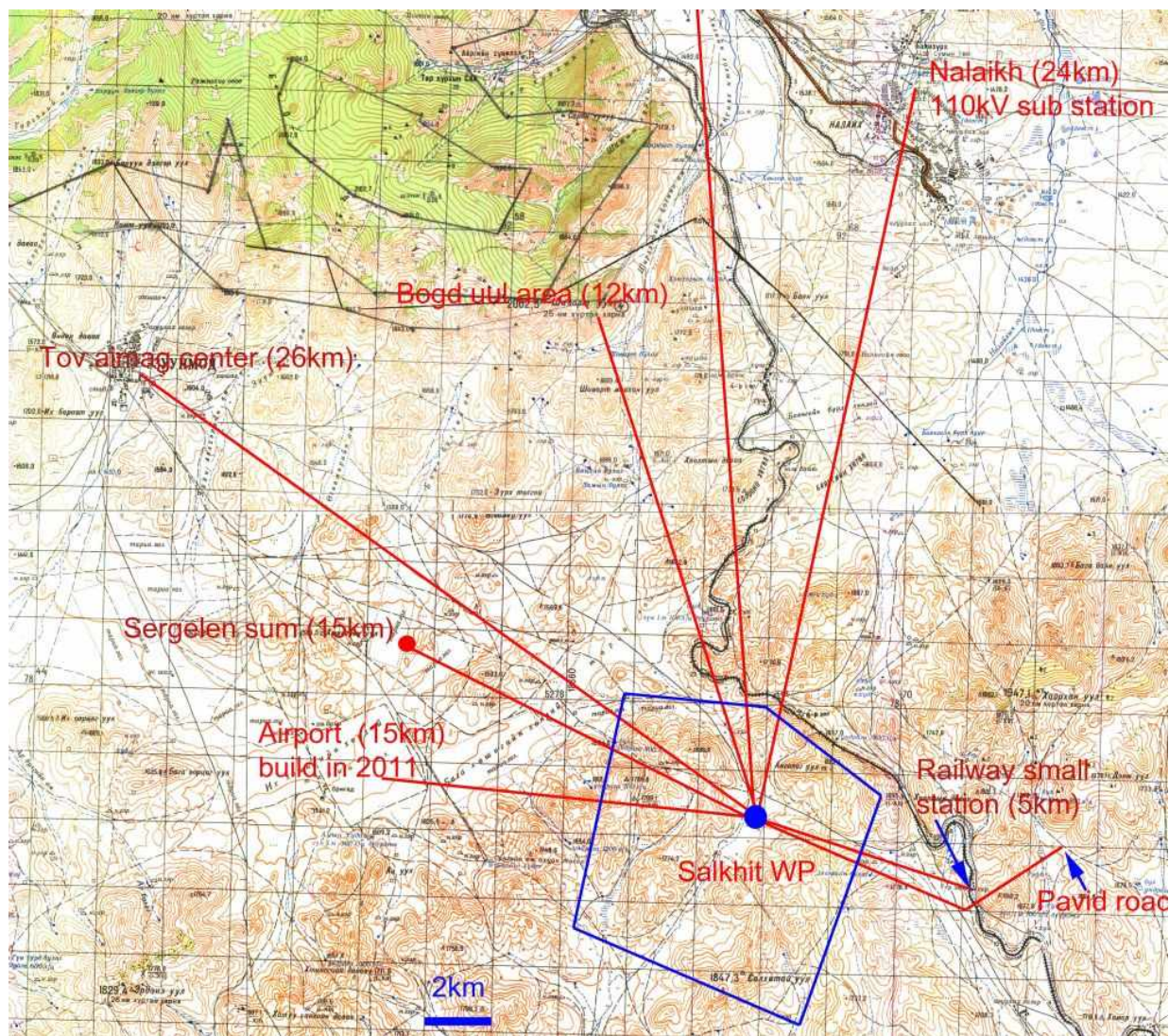
The Project is located in Salkhit Mountain, Tsagduult and Shar Huviin Nuruu of Sergelen soum, Tuv aimag, approximately 70 km southeast of the capital city Ulaanbaatar.

The area is very remote: 11 km from a paved road, 5 km from a railway line, 13 km from the nearest 35 kV overhead line, and 22 km from the 110 kV Nalaikh substation. The nearest residential areas are 5 and 8 km away, where railway station employees and herders live (shown

in Figure 1).

GPS coordinates of the Salkhit substation is E 107°11'19.7" longitude and N 47°34'37.1" latitude. The specific Project site layout with co-ordinates of 31 wind turbine generators (WTGs) is attached in Appendix 2.

Figure 1. Salkhit wind farm site location



A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Mongolia (host)	Clean Energy LLC (private entity)	No
Sweden	Swedish Energy Agency (public entity)	No
...	...	

A.4. Reference of applied methodology and standardized baseline

>> Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 12.1.0.

This methodology refers to the latest approved versions of the following tools:

- AM Tool 07 “Tool to calculate the emission factor for an electricity system” version 02.2.1;
- AM Tool 01 “Tool for the demonstration and assessment of additionality” version 5.2;
- AM Tool 02 “Combined tool to identify the baseline scenario and demonstrate additionality” version 2.2 (this tool is not applicable to the project);
- AM Tool 03 “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” version 2 (this tool is not applicable to the project).

A.5. Crediting period of project activity

>> A 7 year renewable crediting period was chosen, starting from 24 June 2013 to 23 June 2020.

A.6. Contact information of responsible persons/entities

>> Clean Energy LLC – Project Participant:

Enkhsaikhan Tumen-Ulzii, Senior Operations Engineer, email: Enkhsaikhan@cleanenergy.mn, Tel: +976 9411 2123

Baigalmaa Chinbat, Finance Manager, email: baigalmaa@cleanEnergy.mn, Tel: +976 9904 4035 (Appendix 1)

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

>> The Project is comprised of:

- 31 wind turbine generators of GE 1.6-82.5xle type, each with a 1.62 MW capacity;
- A complete 2x50 MVA 110/35 kV substation with SVC;
- 28km long 110kV double circuit high voltage transmission line;
- 24km long 35kV cable network.

31 Wind Turbine Generators (WTGs) were installed on Project site each with kiosk transformers. All turbines are connected to 110/35 kV onsite substation via 35 kV (underground) cable network. The onsite (Salkhit) substation is connected via 110 kV double circuit high voltage transmission line to the Nalaikh substation, where it is transferred to the Grid. Detailed explanation with figures and diagrams are included in the section C (see figure 2.1 and 2.2).

The commercial operation date is 25 June 2013. The first Monitoring Period started from 24 June 2013 to 31 Dec 2013. The second MP is from 1 Jan 2014 to 30 June 2014. Third MP is from 1 July to 31 Dec 2013. Monitoring Report will be done twice a year instead of once a year.

Construction lasted about 2 years from 2011 (early civil works started in June 2011 while construction and erection work started in Apr 2012 and continued till Aug 2013). Table 3 shows key dates related with Project commissioning.

Table 3. Project Commissioning Dates

Operations license issued	19 June 2013
Project opening ceremony	20 June 2013
The commercial operation date and the date of sealing/resetting meters	25 June 2013
State commissioning act issued	8 Jul 2013
Grid connection of all WTGs reached	19 Jul 2013

The Project is implemented as described in the registered PDD, but the operation date was slightly delayed compared to the expected timeframe in the registered PDD. Project implementation since operation is in accordance with company plans and controls except for delay in hand-over and lower electricity supply to the grid. The reason for delay in hand-over is related with contracting issues with sub-contractors that are being solved. Reasons for lower electricity supply were mainly caused partly by power curtailment from the Grid Company and the lower wind speed than the forecast.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

>> No temporary deviations have been applied during this monitoring period.

B.2.2. Corrections

>> No corrections have been made during this monitoring period.

B.2.3. Changes to start date of crediting period

>> No changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

>> No inclusion of a monitoring plan to the registered PDD.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

>> No changes have been registered this monitoring period.

B.2.6. Changes to project design of registered project activity

>> No changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.

B.2.7. Types of changes specific to afforestation or reforestation project activity

>> Not applicable.

SECTION C. Description of monitoring system

>> Meters Readings and Monitoring Points

Both electric meters at Nalaikh and Salkhit substation (shown in Figure 2.1) were read and measured continuously with monthly cross-check. The net on-grid electricity generation was based on the main meter installed at the Nalaikh substation. The monthly compile is recorded through joint reports, signed and approved by both parties. This joint report serves as the basis for invoice and payment. Both main and control meter at Nalaikh substation has been regularly checked and read by both parties; and is owned by Clean Energy. While the main meter of Nalaikh substation will remain the property of Clean Energy, the control meter is property of the Grid company (National Electricity Transmission Grid) as per the PPA. Electricity export and import between the Grid and the Project are continuously measured on both Salkhit and Nalaikh

substations. Meters at Salkhit substation measures electricity export and import through the 110 kV Overhead Transmission Line (OHL).

Figure. 2.1 Schematic of metering arrangement (for demonstration purpose only)

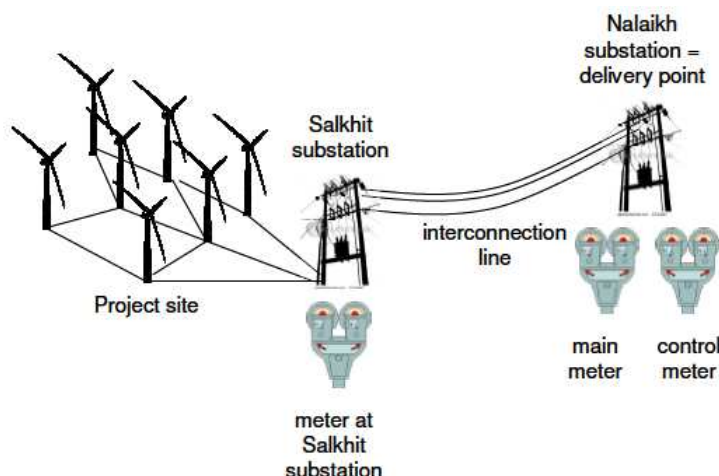
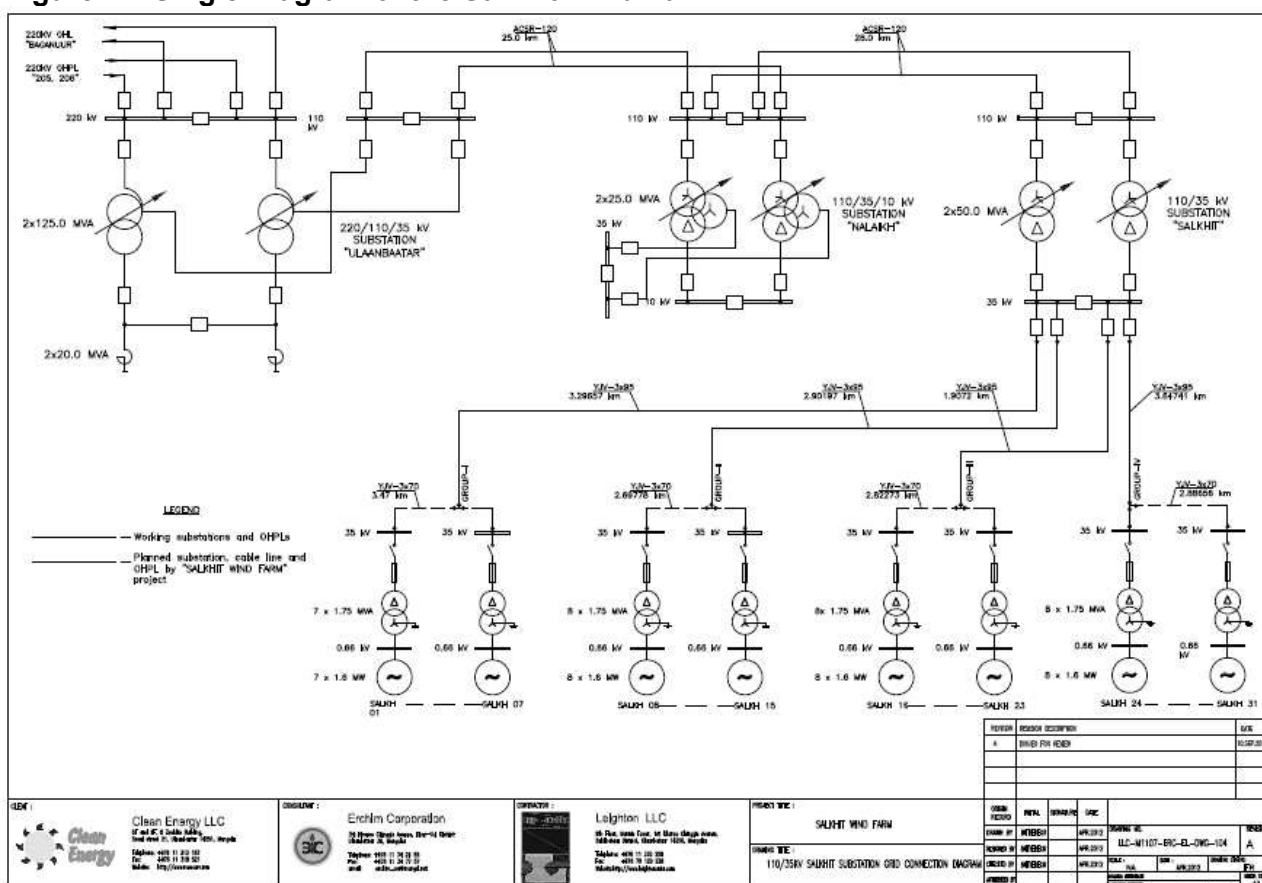


Figure 2.2 Single Diagram of the Salkhit Wind Farm



The detailed monitoring points of the Salkhit Wind Farm can be seen from the Figure 2.2. 31 WTGs are divided into 4 strings (one group with 7 WTGs and three groups with 8 WTGs). They are connected to the 110/35 kV Salkhit substation through 35kV underground cable network. Generated electricity is transmitted from the Salkhit substation through 110kV double circuit high voltage transmission line to 110/35/10 kV Nalaikh substation with further connection to the 220/110/35 kV Ulaanbaatar substation from where the electricity is distributed.

Responsibility, Data Collection Procedures and Quality Control

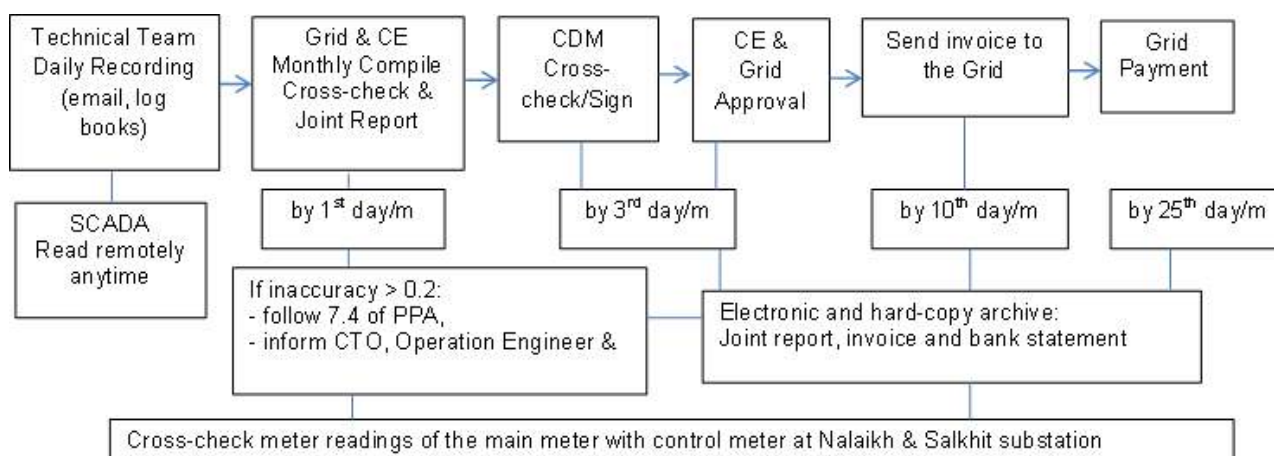
The technical team, comprised of CE engineers and technicians, are in charge of operation and meter reading. The daily logs are archived electronically and in hard-copy with signatures of the shift team, and sent through email to the operation team. Meters were read in accordance with the PPA. The monthly compile is completed by engineers from both parties, the electricity seller (CE) and the buyer (Grid company), on the first day of each month. The monthly joint report records the electricity export and import, and presents the final confirmed quantities from the main and control meter at Nalaikh substation. The cross-checked results are reported to the Senior Operation Engineer for sign-off and approval from the Chief Technical Officer. Only after final double-confirmation, the monthly joint reports are signed and stamped by both parties.

The accuracy of meters is within the required standard of 0.2.

Figure 3.1 describes the monitoring system with tasks, roles and responsibilities. The detailed organizational chart is shown in Figure 3.2. All data were correct and signed off, approved and stored. Regular improvements have been made on the monitoring process.

There are 3 main procedures related with the monitoring system. The monthly meter reading and invoicing procedure approved on 1 Oct 2013 specifies all roles and responsibilities for monthly meter reading, reporting and invoicing with deadlines as shown in the Figure 3.1. Information Exchange Procedure and the Shift Change Procedure specify requirements for daily operation. Emergency procedures are included in the Information Exchange Procedure, but separate Emergency Response Plan has been developed.

Figure 3.1 Monitoring System Diagram: Roles and Responsibilities



Abbreviations

SCADA	Supervisory Control and Data Acquisition
Grid	National Electricity Transmission Grid State Owned Stock Company (old name on the PPA is "Central Regional Electricity Transmission Grid")
CDM	Clean Development Mechanism
m	month
CTO	Chief Technical Officer
SOE	Senior Operation Engineer

Invoices are sent to the Grid company based on the signed joint report, and payments are made in accordance with the signed joint report and invoice. Finance and accounting team makes sure all payments are transferred on time in accordance with the submitted invoice. Signed monthly joint reports are compiled and archived by the finance team for accounting purpose. All payments from the electricity sale are transferred to the revenue account only; so the payments can be tracked online against the invoiced amount.

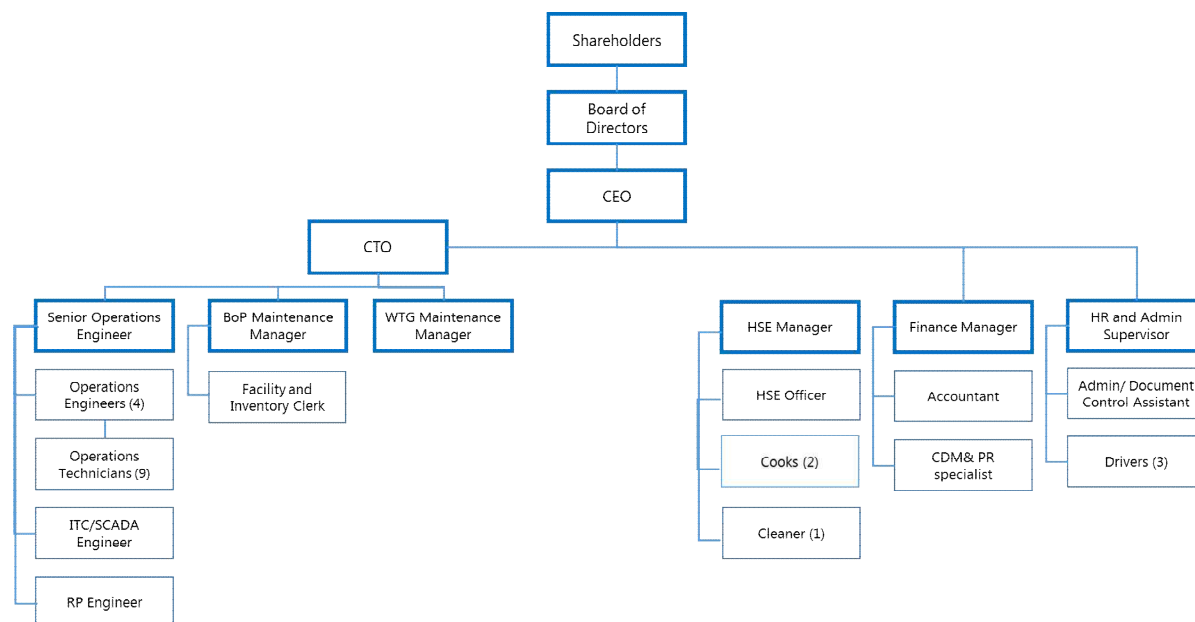
SCADA

Meters at Salkhit substation can be read remotely from the SCADA through a communication line. Both Grid Company and Clean Energy have the ability to read either meter. Meters at Salkhit substation can record on memory the accumulated kilowatt-hours. However, SCADA has not yet been officially handed-over from the contractor. Thus, manual meter readings have been used as the main source for invoicing. The meter for monitoring of the emission reductions is the same as used for electricity sales to the Grid and the metering data will be cross-checked with sales data.

Meters and Calibration

A1800 ALPHA meters from Elster were installed at both the Nalaikh and Salkhit substations. These are world-class, highly accurate, robust, system ready meter suited for commercial and substation application. Accuracy class is 0.2.

Figure 3.2 Organizational structure of Clean Energy LLC



All meters at Nalaikh and Salkhit substation were calibrated and checked for accuracy by the National Electricity Transmission Grid (NETG or Grid company), a certified body by the Mongolian Agency for Standardization and Metrology, before commercial operation date. The certificates of Approval for the meters were issued on 06/06/2013 valid for 8 years till 06/06/2021.

Both meters at Nalaikh and Salkhit substation will be calibrated in accordance with the national regulations. As specified by the PPA, inspection, testing and calibration should be in accordance with the “Code of Energy Utilization” and other relevant rules and regulations.

The frequency of calibrations is in accordance with the national regulations. A1800 Alpha meters are factory-calibrated and periodically perform self tests that verify the meter is operating properly¹. Errors are displayed on the LCD. The detailed information about self test can be found from “A1800 Alpha Meter” Technical Manual Rev. 02 published in 2011 by Elster Metronica (page 77).

The meters have been maintained according to the appropriate industry standards. No errors were detected during the monitoring period on any meters both at Nalaikh and Salkhit substation. The net electricity generation output registered by the main meter alone is used for the purpose of billing and emission reduction verification as long as the error in the meters is within the agreed limits.

The main and control meters at Nalaikh substation were jointly inspected and sealed on 25 June 2013 on behalf of the parties concerned. The meter readings were reset and sealed by both parties with numbers shown in the Table 4.

Table 4. Nalaikh Meter Sealing, 25 June 2013

Line	Salkhit-B /control/	Salkhit-B	Salkhit-A	Salkhit-A /control/
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¹ Elster Electricity (2005), A1800 Alpha Meter Family Product Bulletin, p. 27

Meter no.	01258916	01229304	01229303	01258912
Meter model	A1802RAL-P4GB-DW-4	A1802RAL-P4GB-DW-3	A1802RAL-P4GB-DW-3	A1802RAL-P4GB-DW-4
CE sealing no.	E20946	E20945	E20932	E20997
NETG sealing no.	ΠΧ ²	ΠΧ	ΠΧ	ΠΧ

The technical team regularly undertakes examinations from the National Dispatch Center to obtain certificates for operating the wind farm under the Central Electricity System. The technical team also attends various operation related trainings for health and safety.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

(Copy this table for each piece of data and parameter)

Data/parameter:	EF_grid,CM,y
Unit	tCO ₂ e/MWh
Description	The combined margin emission factor of the electricity grid
Source of data	Registered PDD
Value(s) applied)	1.061
Choice of data or measurement methods and procedures	Reading a data of the Electric meter
Purpose of data	Calculation of baseline emissions
Additional comments	Fixed for the duration of the first crediting period.

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Data/parameter:	EG_facility,y
Unit	MWh
Description	Quantity of net electricity generation supplied by the Project plant/unit to the grid in year y
Measured/calculated/default	Measured
Source of data	Electricity meter. The net electricity generation is calculated from supply to the Grid and import from the Grid, as per the registered PDD.
Value(s) of monitored parameter	(60,726.468)
Monitoring equipment	MWh
Measuring/reading/recording frequency:	Continuous measurement compiled daily and monthly in daily log and monthly joint reports.
Calculation method (if applicable):	Net electricity supplied by the Project to the Grid is calculated from supply to the Grid and imports from the Grid using the main meter at the Grid (Nalaikh) sub-station.

² Or PKh in English.

QA/QC procedures:	<p>The meter for monitoring of the emission reductions is the same as used for electricity sales to the Grid, and the metering data are cross-checked with sales data.</p> <p>The meters will be maintained according to the appropriate industry standards. The metering equipment are calibrated and checked for accuracy by a qualified third party as described in Annex 4 in the PDD. The frequency of calibrations is in accordance with the national regulations. The accuracy of the metering equipment is 0.2%.</p> <p>The monthly net electricity generation supplied to the Grid is approved and signed off by the Senior Carbon Finance Specialist and can be cross-checked with the revenue bank statement.</p> <p>A back-up meter is installed at the on-site substation.</p>
Purpose of data:	Calculation of baseline emissions
Additional comments:	The electricity meter at the Nalaikh sub-station is the main meter.

D.3. Implementation of sampling plan

>> Not applicable.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>> The baseline emissions are calculated as follows:

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

Where:

BE_y is the baseline emissions in year y (tCO₂e/yr).

EG_{facility,y} is the quantity of net electricity generation supplied by the CDM project activity in year y (MWh/yr).

EF_{grid,CM,y} is the combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version³ of the "Tool to calculate the emission factor for an electricity system" (tCO₂e/MWh). EF_{grid, CM} was calculated at 1.061 tCO₂e/MWh.

Therefore, baseline emissions can be calculated as follows:

$$BE_y = BE_{2014} = EG_{\text{facility},y} \times EF_{\text{grid},CM,y} = 60,726.468 \text{ MWh} \times 1.061 \text{ tCO}_2\text{e/MWh} = 64,430 \text{ tCO}_2\text{e}$$

Monthly data and calculations are included in the spreadsheet in Appendix 1.

E.2. Calculation of project emissions or actual net GHG removals by sinks

>> There are no Project emissions for wind power in accordance with the methodology.

E.3. Calculation of leakage

>> According to the methodology, no leakage is considered for the Proposed Project Activity.

³ See section B.1. for the version.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total (01/07/2014 to 31/12/2014)	64,430	0	0	0	64,430	64,430

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	90,123	64,430

E.6. Remarks on difference from estimated value in registered PDD

>> The emission reductions estimated in the registered PDD are 178,778 tCO₂e per year, thus for the current monitoring period of 01/07/2014 to 31/12/2014 (184 days) the estimated emission reductions is $178,778 \times 184 / 365 = 90,123$ tCO₂e. Calculations are shown in the Appendix 1.

The actual emission reductions achieved during the first monitoring period are lower than that ex-ante estimated volume in the registered PDD.

The main reasons for the difference between the ex-ante estimated and the actual achieved reductions are:

- The monitoring period covers 6 months period (less than one year).
- Actual wind records were lower than the estimated electricity supply based on historic wind records.

The Project is still facing curtailment from the National Dispatch Center, limiting production by about 1,099,688 kWh (48 % of delivery loss) during this period (the calculation is described in the Appendix 1: Operation Summary).

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Clean Energy LLC
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City	Ulaanbaatar
State/region	-
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E-mail	sukhbaatar@newcom.mn
Website	www.cleanenergy.mn
Contact person	Sukhbaatar Tsegmid
Title	Chief Executive Officer
Salutation	Mr.
Last name	Tsegmid
Middle name	-
First name	Sukhbaatar
Department	-
Mobile	(+976) 9911 6244
Direct fax	(+976) 7011 1341
Direct tel.	-
Personal e-mail	-
Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Clean Energy LLC
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Country	Mongolia
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Contact person	Enkhsaikhan Tumen-Ulzii
Title	Senior Operations Manager
Salutation	Mr
Last name	Tumen-Ulzii
Middle name	-

First name	Enkhsaikhan
Department	-
Mobile	(+976) 9411 2123
Direct fax	-
Direct tel.	-
Personal e-mail	eegii_ac@yahoo.com
Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Clean Energy LLC
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Building	Naiman Zovkhis
City	Ulaanbaatar
State/Region	-
Postcode	14251
Country	Mongolia
Telephone	-
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E-mail	baigalmaa@cleanenergy.mn
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Contact person	Baigalmaa Chinbat
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Salutation	Mrs
Last name	Chinbat
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		