



Monitoring report form for CDM project activity
(Version 06.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

Title of the project activity	Amayo 40 MW Wind Power Project - Nicaragua	
UNFCCC reference number of the project activity	2315	
Version number of the PDD applicable to this monitoring report	6	
Version number of this monitoring report	Version 6	
Completion date of this monitoring report	October 13th 2017	
Monitoring period number	1 st MP	
Duration of this monitoring period	12/04/2016 to 30/06/2017	
Monitoring report number for this monitoring report	N/A	
Project participants	Consorcio Eólico Amayo S.A. Shell Trading International Limited	
Host Party	Host Country Nicaragua	
Sectoral scopes	1-energy industries (renewable/non-renewable sources).	
Applied methodologies and standardized baselines	ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 16 – November 2014).	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0	96,962
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	129,640 ¹ GHG emission reductions	

¹ According to PDD version 6, the amount of GHG emission reductions for a year is 106,335, therefore for a monitoring period of fifteen months, the amount is 129,640.1 (106,335CERs / 12mo = 8,861.3 CERs/mo * 14.63mo = 129,640.1 CERs).

SECTION A. Description of project activity

A.1. General description of project activity

The purpose of the project activity is to produce and provide electricity to the Nicaraguan grid by using wind power as the energy source. In order to accomplish this objective, the project installed nineteen 2.1 MW, 60HZ Suzlon wind turbine generators model S88, for a total power capacity of 39.9 MW. The electricity is injected to the 230 kV transmission line through a substation that was built by the project owner, and then distributed to the national grid.

Amayo wind farm was connected to the grid on 9th February 2009 and started to produce electricity on 12th February 2009, as the first days were required to energize the main transformer and test the electrical circuits. Since then, the wind farm has been fully operational.

Table 1: Implementation of the Project

DATE (DD/MM/YY)	Key events
01/01/08	The construction activities started
09/02/09	Connection to the grid / internal tests
12/02/09	First production of energy
12/04/09	Registration date and starting date of the crediting period
12/04/09-30/09/09	The 1 st monitoring period
01/10/09-31/08/10	The 2 nd monitoring period
01/09/10 – 30/04/11	The 3 rd monitoring period
01/05/11 – 31/03/12	The 4 th monitoring period
01/04/12 – 30/04/13	The 5 th monitoring period
01/05/13 – 30/06/14	The 6 th monitoring period
01/07/14 - 30/06/15	The 7 th monitoring period
01/07/15 - 11/04/16	The 8 th monitoring period
11/04/16	End of first crediting period
12/04/2016	Starting date of the second crediting period
12/04/2016 - 30/06/17	The 1 st monitoring period (this report)

The project was registered as a CDM project by the UNFCCC on April 12th 2009, under reference number 2315: Amayo 40 MW Wind Power Project - Nicaragua. More background information can be found in the Project Design Document (PDD) version 6 and related documents, available on the UNFCCC website: <https://cdm.unfccc.int/Projects/DB/SGS-UKL1227712726.26/view>.

The project's CDM first crediting period ended on April 11th 2016. Upon approval by the UNFCCC of its Crediting Period Renewal Request, project's CDM second crediting period started on April 12th 2016 and will end on April 11th 2023.

The total emissions reductions achieved in this monitoring period (from April 12th 2016 to June 30th 2017, both days included) are 96,962 tCO₂.

A.2. Location of project activity

Amayo 40 MW Wind Power Project – Nicaragua is located in the Department of Rivas, on the Pan-American Highway at 129 kilometers to the south of the capital city, Managua. The site is located on the south west coast of Lake Nicaragua. The area for the wind farm is centered at the geographical coordinates 11°19'32" N and 85°43'05" W and has a total area of 276.36 ha.

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Nicaragua (host party)	Consorcio Eólico Amayo S.A.	No
Switzerland	Shell Trading International Limited	No

A.4. Reference to applied methodologies and standardized baselines

Approved baseline and monitoring methodology applied:

ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 07 used on PDD version 3 for 1st crediting period; and Version 16 of the methodology was used on PDD version 6 for the 2nd crediting period)

The following tools were applied together with the methodology:

- *"Tool to calculate the emission factor for an electricity system"* (Version 01 used in PDD version 3 for 1st crediting period; Version 04 of the tool used on PDD version 6 for the 2nd crediting period)
- *"Tool for the demonstration and assessment of additionality"* (Version 05 used in PDD version 3 and 6 for 1st and 2nd crediting periods)
- *"Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period"* (Version 03.0.1 was used on PDD version 6 for the 2nd crediting period)".

For reference see:

<https://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN>

A.5. Crediting period type and duration

The starting date of the second crediting period is April 12th 2016 and the end date is April 11th 2023. The crediting period is renewable (the project chose 7 years*3 as crediting period as stated on the PDD version 3).

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

The project implemented a total of nineteen 2.1 megawatt Suzlon S88 60HZ wind turbine generators (hereafter, "WTGs"), with the following operating data: cut-in wind speed 4 m/s, rated wind speed 14 m/s, cut-out wind speed 25 m/s, survival wind speed 60 m/s. The robust design of the wind turbine, with its uniform weight distribution, ensures high levels of safety, reliability and enhanced service life. Suzlon's Advanced Control System includes precisely calibrated sensors installed at each critical junction that closely monitors factors like temperature, wind speed and vibrations. The remote monitoring and control option enhances ease of operation.

The wind turbine S88-2.1 MW is a variable slip wind turbine with an electrical pitch system that has been designed in accordance with Germanischer Lloyd GLIIa Type Certification. With the pitch system the pitch angle of each blade is accurately adjusted to the requirements of the control and/or safety system. It has been designed in order that which means that each blade has its own drive system consisting of a motor, a gearbox and a converter.

The Suzlon wind turbine generator (WTG) has a rated power of 2.1 MW, a standard rotor height of 80 meters and a rotor diameter of 88 meters, and it is designed to withstand harsh environmental conditions. Its robust design and uniform weight distribution ensure high levels of safety and reliability. The main parts of the Suzlon S88-2.1 MW are the nacelle, the tower and the rotor with the blades. All parts have been designed in line with approved industry standards to guarantee operational safety and efficient operation. See below a summary with the main specifications of this equipment:

Table 2: Summary of the main specifications of WTG S88

Main data	Description
Nominal Power	2.1 MW
Rotor diameter	88.0 m
Swept area of rotor	6,082 m ²
Rotor height	79.0 m
Tower height	77.5 m
Rotational speed	15.0 to 17.6 rpm
Number of blades	3
Rotor cone angle	5°
Power regulation	Pitch / SUZLON-FLEXISLIP SYSTEM
Rotor orientation	Upwind
Blade length	43.25 m
Material of the blades	Fibre glass / epoxy
Type of rotor air brake	Pitch / Full blade
Pitch system	
Type description	Electrical
Drives	1 electric motor with gearbox and electrical brake per blade
Backup system	1 battery set per blade
Pitch angle range	95°
Pitch speed	0.1 to 10.0 °/s
Generator system	
Type description	Single fed induction generator with slip rings, variable rotor resistance via SUZLON-FLEXISLIP System
Rated power	2.100 MW
Voltage stator (phase to phase)	600 V
Frequency	60 Hz
Number of poles	4
Synchronous speed	1,800 rpm
Speed range for constant power with SUZLON-FLEXISLIP	1,836 to 2,100 rpm
Yaw System – Bearing	Slide bearing with gear ring, automatic greasing system

The Project also built a control center and a 230/kV outdoor substation. The control center consists of the following:

- A control room, where the computer control center of the wind farm is housed.
- 13.8 kV (LV) cabinets, (one for each phase of the wind farm).
- Energy meters.
- A warehouse, where the critical spares and other material are located for the operation and maintenance of the wind farm.
- Restrooms and changing rooms for the use of the operation and maintenance personnel and visitors.
- A Meeting Room, for the wind farm personnel and for the reception of any institutional visits to the wind farm.

The outdoor 230 kV substation is equipped with the following electrical components: transformer of power 100 MVA, auto valves, voltage transformers, switch, disconnecting switch with earthing blades. Also, are the corresponding elements of protection and control (such as relays) and metering equipment as well as a short (40 m) 230 kV transmission line that connects to the 230kV line which transverses the site.

Each turbine has a low voltage transformer outside the tower. The electricity produced in the generator at 600 V is delivered to its own transformer where the voltage is increased from 600 v to 13.8 kV. Then this electricity is delivery to the 13.8 kV cabinets at the control room, divided by circuits. This electricity is finally sent to the 100 MVA main transformer at the substation to elevate the voltage to 230 kV so it can be injected to the 230 kV transmission line and distributed to the grid.

Table 3: Technical issues that affected plant availability

Location	Event description	Date	Start time	Restart date	Downtime
PLANT	Grid disturbance tripped lines L9170 and L9030. All plant is out of service	28-Aug-16	15:17:41	17:02:00	1:44:19
	Programmed ground clearance for rehabilitation works in AMAYO's High Voltage switchyard and metalclad	19-Oct-16	5:56:00	19:50:00	13:54:00
	230KV L9030 line tripped. All plant is out of service	9-Jan-17	18:08:48	19:43:03	1:34:15
T08	Yaw drive # 3 Fifth stage replacement		5/12/16 23:43	5/13/16 9:50	10:06:48
T13	Blades replacement		5/20/16 17:12	6/17/16 20:00	674:47:53
T16	Yaw Gear Rim Cog repairment		5/26/16 0:00	5/27/16 20:40	44:40:03
T07	Yaw drive #1 and #3 Fifth stage replacement		6/21/16 5:19	6/21/16 18:03	12:43:34
T16	Yaw Gear Rim Cog repairment		8/11/16 6:34	8/12/16 18:06	35:32:29
T16	Yaw Gear Rim Cog repairment		8/17/16 7:06	8/21/16 19:10	108:03:42
T16	Yaw Gear Rim Cog repairment		8/23/16 7:56	8/26/16 20:00	84:03:41
T16	Yaw Gear Rim Cog repairment		8/31/16 7:52	9/3/16 16:48	80:55:21
T19	Blade #1 repairment		9/1/16 7:53	9/6/16 19:02	131:09:12
T16	Blade #3 repairment		9/22/16 7:16	9/30/16 19:06	203:50:23
T15	Blade #3 repairment		10/5/16 8:40	10/13/16 16:56	200:15:57
T05	600V Circuit box's bars replacement		10/26/16 13:55	10/28/16 15:46	49:51:53
T01	Blade #2 repairment		10/31/16 7:27	11/3/16 7:00	71:32:03
T12	Blade #2 repairment		11/29/16 7:33	12/2/16 3:56	68:22:54
T09	Generator's DE bearing replacement		12/21/16 9:03	12/21/16 19:09	10:05:53
T16	Yaw Gear Rim Cog repairment		12/27/16 9:33	12/31/16 0:30	86:56:03
T16	Yaw Gear Rim Cog repairment		1/3/17 19:15	1/7/17 20:46	97:30:24
T08	Generator's neutral repairment		1/26/17 21:16	1/29/17 23:44	74:27:54
T06	High speed shaft replacement		2/14/17 21:47	3/16/17 17:26	715:38:42
T03	600V Circuit box's switch and bars replacement		2/26/17 3:14	3/1/17 0:16	69:01:52
T11	Generator's DE bearing replacement		3/29/17 8:40	3/29/17 19:14	10:33:49
T16	Generator's NDE bearing replacement		4/3/17 10:46	4/3/17 22:36	11:49:42
T17	600V Circuit box's bars replacement		5/11/17 10:43	5/14/17 18:42	79:58:50
T08	Gearbox's middle axis repairment		6/9/17 17:00	6/30/17 23:59	510:59:58
T09	Yaw Gear Rim Cog repairment		6/26/17 14:25	6/30/17 20:29	102:03:33

Other technical issues related to the metering system:

The last calibration of metering system was performed on October 23rd 2014, therefore, according to local standards by INE regulations, next calibration ought to be performed before October 22nd 2016. However, metering system calibration was performed according to the following schedule:

Meter	Date
Main and Back up Meters (230 kV transmission line)	November 12 th 2016
Main and Back up Meters at Cell 4 and at Cell 5 (13.8 kV meter)	November 14 th 2016
Main and Back up Meters at Cell 3 and at Cell 6 (13.8 kV meter)	November 13 th 2016

B.2. Post-registration changes**B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines**

There have not been any temporary deviations.

B.2.2. Corrections

During the first monitoring period (from April 12th 2016 to June 30th 2017, both days included) verification of the second crediting period, a PRC for the approved 6th version of the PDD was requested, since Parameter **EC^{13.8kV Phase II, y}** accidentally was not included in Section B.7.1 during the updating process of the PDD for the Crediting Period Renewal. An updated version of the PDD, which also included an update of Appendix 1: "Contact information of project participants", was submitted to the DOE for a validation opinion.

B.2.3. Changes to the start date of the crediting period

The project's CDM first crediting period ended on April 11th 2016. Upon approval by the UNFCCC of its Crediting Period Renewal Request on March 11th 2016, project's CDM second crediting period started on April 12th 2016.

B.2.4. Inclusion of monitoring plan

There has not been an inclusion of a monitoring plan.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

During the second monitoring period (October 2009 to August 2010, both months included) a revision of the monitoring plan was requested. The monitoring plan has been revised and it was approved by the CDM - UNFCCC on September 8th 2011.

The tool states that emission factors, values or emission benchmarks that are used and determined only once for the crediting period should be updated. In this project, the relevant factor is the combined margin emission factor (CM), which according to the relevant tool has to be updated for a second crediting period (Tool to calculate the emission factor for an electricity system, Version 04.0, paragraphs 36, 68, 81). Therefore, the current baseline must be updated.

This concludes the application of the tool "*Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period*"

B.2.6. Changes to project design

There have not been any changes to project design of registered project activity.

SECTION C. Description of monitoring systemData Generation

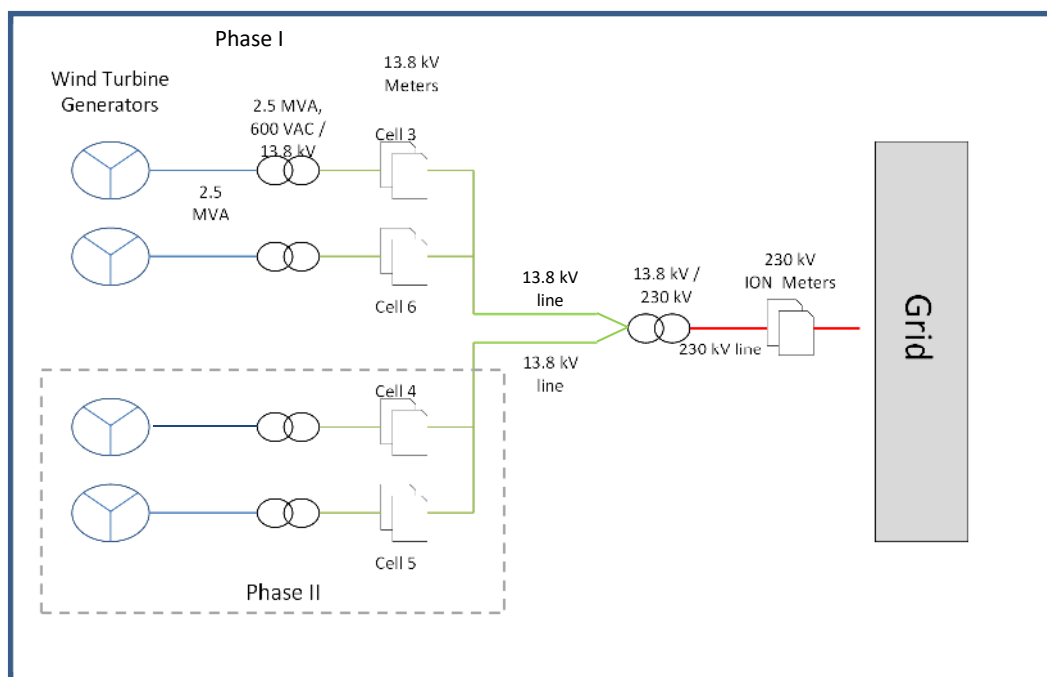
The data is first generated at the metering system of the plant. The main parameter monitored is the electricity supplied to the grid by the project activity (EGy), as indicated in the PDD section B.7.1. The electricity supplied to the national grid is continuously measured and recorded by the metering system which includes:

- The main revenue meter and a backup meter both installed at the high voltage side of the main transformer at the plant facilities.
- Four main meters and four back up meters installed at the 13.8 kV medium voltage side of the main transformer, which measures separately the energy from Phase I and Phase II.

Consorcio Eólico Amayo, S.A. (Phase I) and Consorcio Eólico Amayo Fase II, S.A. (Phase II) are located side by side on the same geographical area of the Department of Rivas. Both have their own collector for energy at 13.8 kV level that goes into one 13.8 kV bus bar at the entrance of the low side of the transformer located at

the 230 kV substation, which is the common point where Phase I and Phase II deliver power to the Nicaraguan Grid. Phase II connects into the same Substation that Phase I does since this is the nearest point to deliver power to grid. Said substation has one main 100 MVA transformer that can handle the total output of Phase I and Phase II, which is approximately 71 MVA at its peak. This way, Phase II has been able to connect to the grid faster by using the same Substation that Phase I is using. The metering scheme is depicted on Figure 1 below.

Figure 1: Metering scheme



The Normative “Normativa de Operación” in place allows two Commercial Agents to deliver energy through the same connection point. In case that the Energy Delivery Point is the same -as in this case- the energy produced by each Agent (Phase I and Phase II) must be identified at each Commercial Agent’s metering point². If the latter are not of the same voltage as the delivery point, a calculation (which must be registered at the CNDC³) may be established in order to account the exact amount of net energy provided by each agent⁴.

Since the commissioning of Phase II, the net amount of energy delivered to the grid can no longer be measured from the high voltage, outside meter, as the latter now indicates the overall generation of the entire wind farm (Phase I and Phase II). The proportion of energy generated by each phase at the 13.8 kV medium voltage side is then applied to the generation by the entire farm measured on the high voltage side, thus allowing to obtain the contribution of energy corresponding to each phase of the project.

It was necessary to paste to the spreadsheet the delivered and received energy values both from the ION Main Revenue Meter and from the meters located at the 13.8 kV low voltage side. In the spreadsheet is possible to easily distinguished the delivered energy (kWh) coming from the main revenue meter (ION Main Meter) which measures the total delivery energy from the total wind farm (Phase I+ Phase II) and the energy values coming from each one of the meters installed at the 13.8 kV voltage side (Cell 3 to Cell 6), where Cell 3 and Cell 6 measures the delivered and received energy corresponding to Amayo Phase I, and Cell 4 and Cell 5 the energy coming from Amayo Phase II (see Figure 1).

² Recall that each Phase of the project is registered as an independent commercial agent.

³ National Load Dispatch Centre

⁴ See section 4.1 (metering location) on page 2 of the Commercial Annex III (Commercial Metering System) of the Operating Regulations (Normativa de Operación), available to the DOE (original document in Spanish).

The second step was to calculate delivered and received energy for the project at the grid delivery point using the values of energy delivered and received by the entire wind farm at the ION 230 kV Main Meter. Each phase's shares of energy generation/consumption measured at the 13.8 kV meters are applied to the overall generation in order to determine how much of the latter corresponds to each. The formulas described in Section E.1 were then used to calculate the delivered energy to the grid (EG) and the energy received (EC).

The description of each parameter will be shown on section D.

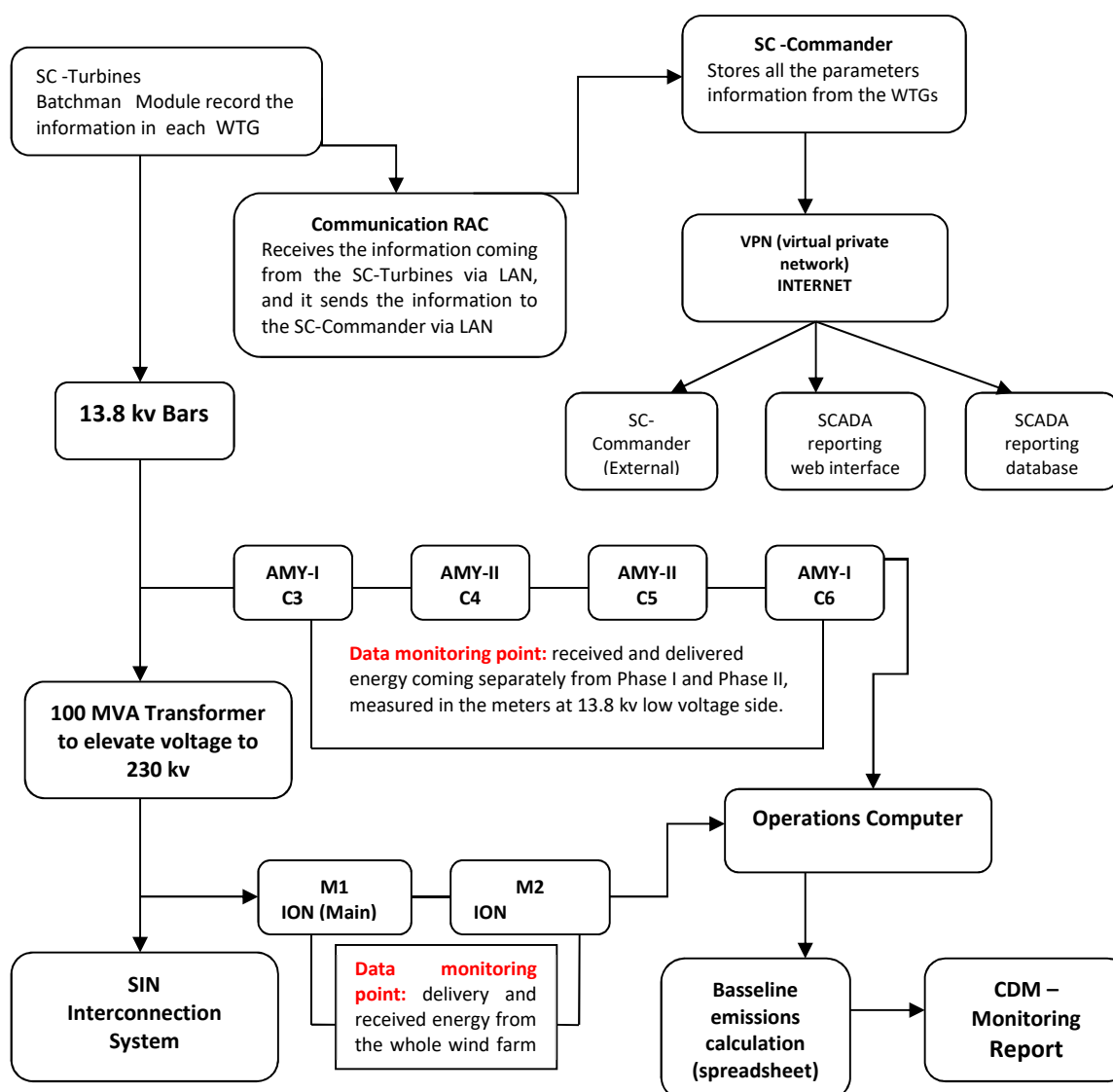
Data Recording and Calculation

All the meters mentioned above keep track of both the electricity supplied and received from the grid. Daily records are kept by the plant operator in the operation data files. Additionally, these same files are kept in back up CD's.

The data readings used for calculation methodology are taken from the metering system, which are the monitoring points. They keep track of both the electricity supplied and received from the grid. In turn, net energy delivered is used to calculate baseline emissions. Net energy is obtained by subtracting the received energy from the delivered electricity to the grid. The net energy delivered in each hour is multiplied by the emission factor to obtain baseline emissions. The emission factor for the first crediting period for Amayo 40 MW Wind Power Project - Nicaragua was 0.7127⁵ tCO₂/MWh, and for the second crediting period the emission factor was updated to 0.6273⁶ tCO₂/MWh.

⁵ As indicated in the PDD version 3, project participants chose an *ex-ante* emission factor, which was calculated and presented in sections B.6.1 and B.6.3 of the above-mentioned document.

⁶ As indicated in the PDD version 6, *ex-ante* emission factor, was recalculated and presented in sections B.6.1 and B.6.3 of the above-mentioned document.

Figure 2: Flow diagram of data recording for baseline emissions calculations.

As it can be seen in the figure above, wind turbines (WTG) data parameters are sent from each WTG to the Suzlon server SC-Commander and to the SCADA, allowing the wind farm to easily follow up the performance of the parameters and generate reports. In turn, the energy generated at each WTG is transported through several circuits to the 13.8 kv Bar, where the electricity coming from each of the two phases is measured in separate cells, which each one has separates meters (one as main meter and another as back up meter). Cells 3 and 6 measures energy from Amayo I, and cells 4 and 5 from Amayo II. After that stage, energy is sent to the main transformer at the 230 kv side, where the voltage is increased from 13.8 kv to 239 kv so it can be delivery to the 230 kv transmission line. At that side of the transformer, both the main revenue Ion meter and the backup meter (M1 and M2 in the figure above) are located.

Quality Assurance (QA) and Quality Control (QC) procedures applied

The emission reductions achieved by the project have to be verified internally, so the following steps are taken to ensure the best possible data quality:

- Ensure that the data is complete and transparent. Ensure that they are in the same format. Make sure that the data is checked on consistency and transposition errors (these can occur when data is transported from one system to another). In case that the delivered energy to the grid (gross energy) records used in the CERs calculation are not in accordance with the delivered energy specified in the invoices, then the most conservative data will be used for the CERs calculation.
- Calibration of the energy meters at least once every two years according to local standards by INE regulations (See page 9 of the Commercial Annex in the Operation Regulations issued by INE (in

Spanish: Normativa de Operación, Anexo Comercial: Sistema de Mediciones Comerciales, inciso VII.: Revisión de los medidores habilitados). The calibration can be performed only by entities that are authorized or certified by the national authority CNDC (in English: National Dispatch Center).

- Storage of project data for at least 2 years after the end of the crediting period or the last issuance of CERs for this project activity.

Organizational structure, roles and responsibilities of personnel for the monitoring plan

The purpose of the monitoring organization is that:

- All staff involved in monitoring know what to do and how often;
- Quality assurance and quality control measures are operated. This ensures that the generated data is complete, transparent and reliable.

The project has implemented a management structure where monitoring responsibilities are explicitly defined. The O&M department's is responsible for ERs monitoring, record keeping and the implementation of proper QA procedures. All O&M procedures have been adapted to include the carbon monitoring component and the adequate accounting of the emission reductions.

The person in charge of the carbon credits monitoring is in charge of the following activities:

- Calculation and record keeping of the emissions reduced by the project activity, according to the general guidelines described in the monitoring plan.
- Managing all the validation, registration and certification process of the project's GHG emission reduction.
- Coordination and management of the marketing of the CERs in the relevant carbon markets.
- Providing reliable evidence during verification allowing the uniquely identification of ER reductions from each phase (e.g. invoices from each company showing the amount sold by each phase of the project).

Table 4: Roles and Responsibilities Matrix

	Plant Manager	CDM Coordinator	Operations Manager
Collect data			
Power delivered to grid	R	I	E
Ensure calibrations and data quality	R	I	E
Process data			
Input of raw data in spreadsheet	I	E	I
Cross check data and correct	I	E	E
Calculate emission reductions	I/R	E	I
Quality check calculated emission reductions	I/R	I	R/E
Reporting and archiving			
Report data gaps and errors (**)	I	R	E
Report emission reductions to date	R/E	R/E	R/E
Archiving of procedures and certificates (***)	R	I	E
Archiving of data	R	I	E

E=Execute
R=Responsible
I= To be informed

Record Keeping Arrangements

The sections below provide an overview of what relevant documents (files, manuals, reports, etc.) are kept and where they are stored.

Table 5: Record Keeping Arrangements

Document	Responsible for generation	Storage location	Update frequency	Remarks

Calibration certificates revenue meters	AMAYO calibration engineer	Office AMAYO	Once every two years	
Power delivered to the grid	AMAYO	Office AMAYO	Monthly (power delivered to the grid), where applicable (meter audits)	Compare measured output against invoiced power
Audits of power meter	External verifier	Office AMAYO	Where applicable	Change of meter and meter problems trigger an external audit.
Calculation worksheet	AMAYO	Office AMAYO	When applicable	Make sure that this sheet holds all relevant data and back up every month.
Back up of the power delivered to the grid data in the company's server	AMAYO	Office AMAYO	Monthly	Make sure that the delivered energy to the grid is also storage in the server in case of any incident with the operation's computer.

Emergency Procedures

Table 6: Emergency Procedures

Measured parameter	Calibration procedures	Maintenance procedures	Procedure in case of failure	Default value to use in case of failure	Relevant documents
Power delivered to the grid [MWh] Main Meters	Every two years with an audit from the grid operator	None	Replacement of the meter by an equivalent unit, upon which an audit must be carried out by grid operator.	Value to be taken from backup meter. In case that both meters fail values to be taken according to the procedures of "Normativa de Operación" using the voltage and current values of the Dispatch Center.	Audit reports commissioned by grid operator in Spanish and meter documentation according to "Normativa de Operación vigente".
Power delivered to the grid [MWh] BackUp Meters	As above	As above	As above	Value to be taken from main meter.	As above

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

The following values are presented on section B.6.2 of the registered PDD (version 06).

Data/Parameter	$NCV_{i,y}$
Unit	TJ/Gg
Description	Net calorific value (energy content) per mass unit of fuel i in year y .
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied	Fuel Oil: 39.8 TJ/Gg Diesel: 41.4 TJ/Gg

Choice of data or measurement methods and procedures	No other data is publicly available. IPCC guidelines have been used in a conservative manner.
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	$EF_{CO_2,i,y}$
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor of fossil fuel <i>i</i> in year <i>y</i> .
Source of data	IPCC default values at the lower limit if the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National Greenhouse Gas Inventories.
Value(s) applied	Fuel Oil: 75.5 tCO ₂ /TJ Diesel: 72.6 tCO ₂ /TJ
Choice of data or measurement methods and procedures	No other data is publicly available. IPCC guidelines have been used in a conservative manner.
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	D_i
Unit	tons/gal
Description	Density of fuel <i>i</i> in year <i>y</i> .
Source of data	IEA Energy Statistics Manual (p. 181)
Value(s) applied	Fuel oil: 0.9634 kg/lit Diesel: 0.8439 kg/lit
Choice of data or measurement methods and procedures	No regional or national data is publicly available. IPCC Guidelines (2006) do not provide information on density so another source had to be sought.
Purpose of data/parameter	Conversion from volume to mass units of fuel consumption data
Additional comments	

Data/Parameter	$FC_{i,m,y}$
Unit	Thousand gals
Description	Amount of fossil fuel <i>i</i> consumed by each power plant/unit <i>m</i> in year <i>y</i> .
Source of data	INE - Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute)
Value(s) applied	Data for the 2012-2014 period is available in the spreadsheet (Amayo_ER Calculation_Val2) in Appendix 4 of the registered PDD (version 6)
Choice of data or measurement methods and procedures	Data is obtained from official sources
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	$EG_{m,y}$
Unit	MWh
Description	Net electricity generated and delivered to the grid by power plant/unit <i>m</i> in year <i>y</i> .
Source of data	INE - Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute)

Value(s) applied	Data for the 2012-2014 period is available in the spreadsheet (Amayo_ER Calculation_Val2) in Appendix 4 of the registered PDD (version 6)
Choice of data or measurement methods and procedures	Data is obtained from official sources
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	<i>Plant name</i>
Unit	Text
Description	Identification of power sources for the OM (all the plants in the grid).
Source of data	INE- Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute)
Value(s) applied	Data for the 2012-2013 period available in section B.6.1 of PDD (version 6)
Choice of data or measurement methods and procedures	Data is obtained from official sources
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	<i>Plant name</i>
Unit	Text
Description	Identification of power sources for the BM (recent additions to the grid).
Source of data	INE- Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute)
Value(s) applied	Data for the 2013 period, as per table 2 in section B.6.1 of PDD (version 6)
Choice of data or measurement methods and procedures	Data is obtained from official sources
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	$EF_{grid,OMsimple,2012-2014}$
Unit	tCO ₂ /MWh
Description	Simple operating margin CO ₂ emission factor in year y
Source of data	Input parameters described in this section.
Value(s) applied	0.6934 tCO ₂ /MWh (generation-weighted average for 2012-2014)
Choice of data or measurement methods and procedures	As per applicable tool.
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	$EF_{grid,BM,2014}$
Unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor in 2014
Source of data	Input parameters described in this section.
Value(s) applied	0.4291 tCO ₂ /MWh

Choice of data or measurement methods and procedures	As per applicable tool.
Purpose of data/parameter	Combined margin emission factor calculation
Additional comments	

Data/Parameter	$EF_{grid,CM,2014}$
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor in 2014
Source of data	Input parameters described in this section.
Value(s) applied	0.6273 tCO ₂ /MWh
Choice of data or measurement methods and procedures	As per applicable tool.
Purpose of data/parameter	Baseline emissions calculation.
Additional comments	

D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

Data / Parameter:	EG_y
Unit:	MWh
Description:	Net Electricity supplied to the grid by the project activity in period y .
Measured/ Calculated / Default:	Calculated
Source of data:	Parameters $EG^{230kV}_{AMAYO,y}$, $EG^{13.8kV}_{PhaseI,y}$, $EG^{13.8kV}_{PhaseII,y}$, $EC^{230kV}_{AMAYO,y}$, $EC^{13.8kV}_{PhaseI,y}$ and $EC^{13.8kV}_{PhaseII,y}$, which are based on on-site metering system (same data submitted to INE / NIS).
Value(s) of monitored parameter:	154,570.99 MWh
Monitoring equipment:	See boxes below.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	$EG_y = EG^{230kV}_{PhaseI,y} - EC^{230kV}_{PhaseI,y}$
QA/QC procedures:	- Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS. - Crosschecking of the data from the spreadsheet by comparing the delivered energy from the spreadsheet with the delivered energy specified in the invoices⁷.
Purpose of data/parameter	Calculation of baseline emissions

⁷ Invoices reflect gross energy delivered to the grid (i.e. the EG^{230kV}_{PhaseI} parameter), which is the main input for determining EG_y

Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period
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Data / Parameter:	$EG^{230kV}_{AMAYO,y}$
Unit:	MWh
Description:	Quantity of electricity delivered to the grid (230 kV transmission line) by the entire wind farm (Phase I + Phase II) in period y.
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	258,872.04 MWh (See table B of Section E.1) ($EG^{230kV}_{AMAYO,y}$ is ultimately used to determine EG_y).
Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	N/A
QA/QC procedures:	Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)
Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period

Data / Parameter:	$EG^{13.8kV}_{PhaseI,y}$
Unit:	MWh
Description:	Gross electricity generation in period y by Phase I, as measured in the 13.8 kV meters.
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	156,449.99 MWh (See table B Section E.1) ($EG^{13.8kV}_{PhaseI,y}$ is ultimately used to determine EG_y).
Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.

Calculation method (if applicable):	N/A
QA/QC procedures:	Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)
Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period

Data / Parameter:	$EG^{13.8kV}_{PhaseII,y}$
Unit:	MWh
Description:	Gross electricity generation in year y by Phase II, as measured in the 13.8 kV meter
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	104,270.83 MWh (See table B of Section E.1) ($EG^{13.8kV}_{PhaseII,y}$ is ultimately used to determine EG_y).
Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	N/A
QA/QC procedures:	Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)
Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period

Data / Parameter:	$EC^{230kV}_{AMAYO,y}$
Unit:	MWh
Description:	Quantity of electricity consumed from the grid at the 230 kV transmission line by the entire wind farm (Phase I + Phase II) in period y
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	777.35 MWh (See table C of Section E.1) ($EC^{230kV}_{AMAYO,y}$ is ultimately used to determine EG_y).

Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	N/A
QA/QC procedures:	- Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS. - Crosschecking of the data from the spreadsheet by comparing the consumed energy from the spreadsheet with the consumed energy specified in the DTE ("Economic Transaction Document", issued by the dispatch center). In the case of differences, the most conservative value (i.e. the one that results in the smallest number of ERs) will be used.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)
Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period.

Data / Parameter:	$EC^{13.8kV}_{PhaseI,y}$
Unit:	MWh
Description:	Electricity consumption in year y by Phase I, as measured in the 13.8 kV meters
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	284.34 MWh (See table C of Section E.1) <i>$EC^{13.8kV}_{PhaseI,y}$ is ultimately used to determine EG_y).</i>
Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	N/A
QA/QC procedures:	- Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS. - Crosschecking of the data from the spreadsheet by comparing the consumed energy from the spreadsheet with the consumed energy specified in the DTE ("Economic Transaction Document", issued by the dispatch center). In the case of differences, the most conservative value (i.e. the one that results in the smallest number of ERs) will be used.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)

Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period.
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Data / Parameter:	$EC^{13.8kV}_{PhaseII,y}$
Unit:	MWh
Description:	Electricity consumption in year y by Phase II, as measured in the 13.8 kV meter
Measured/ Calculated / Default:	Measured
Source of data:	On-site metering system
Value(s) of monitored parameter:	230.53 MWh (See table C of Section E.1) <i>$EC^{13.8kV}_{PhaseII,y}$ is ultimately used to determine EG_y.</i>
Monitoring equipment:	SCADA system registers values automatically from on-site metering system. According to local standards, using the Ethernet ports from the metering system, data readings are taken and sent simultaneously through an IP connection to Operations computer (where SCADA registers them for backup) and to CNDC Commercial Data Base.
Measuring/ Reading/ Recording frequency:	Data will be measured on site on an hourly basis. Monthly records will be kept.
Calculation method (if applicable):	N/A
QA/QC procedures:	- Meters should have a maximum error of $\pm 0.2\%$ and be calibrated periodically according to local standards for electricity transactions in the NIS. - Crosschecking of the data from the spreadsheet by comparing the consumed energy from the spreadsheet with the consumed energy specified in the DTE ("Economic Transaction Document", issued by the dispatch center). In the case of differences, the most conservative value (i.e. the one that results in the smallest number of ERs) will be used.
Purpose of data/parameter	Calculation of baseline emissions (apportioning of electricity between Amayo Phase I and Amayo Phase II)
Additional comments:	Due to delay in calibration of the meters, its maximum error of 0.2% was apply to the records for the months of October and November 2016 to use the most conservative value for CERs calculation during this monitoring period.

D.3. Implementation of sampling plan

This project does not implement a sampling plan.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

According to ACM0002 (version 16), the baseline emissions of the project are equal to:

$$BE_y = EG_y * EF_{grid,CM,y}$$

where EG_y is the electricity generated by the project in period y supplied to the Grid (in MWh), and $EF_{grid,CM,y}$ is the Combined margin CO₂ emission factor (0.6273 tCO₂/MWh for the 2nd monitoring period).

In the context of this project, the revised monitoring plan states the procedure to determine the electricity delivered to the grid:

$$EG_{PhaseI,y}^{230kV} = \frac{EG_{PhaseI,y}^{13.8kV}}{EG_{PhaseI,y}^{13.8kV} + EG_{PhaseII,y}^{13.8kV}} \cdot EG_{AMAYO,y}^{230kV}$$

where:

$EG_{PhaseI,y}^{230kV}$ is the gross energy delivered to the grid by Phase I in period y

$EG_{AMAYO,y}^{230kV}$ is the gross energy delivered by the entire wind farm (Phase I&II) in period y ,

$EG_{PhaseI,y}^{13.8kV}$ is the gross energy delivered by Phase I in period y as measured on the 13.8 kV internal meters,

$EG_{PhaseII,y}^{13.8kV}$ is the gross energy delivered by Phase II in period y as measured on the 13.8 kV internal meters.

Internal consumption (i.e. energy consumed from the grid; EC_y) will be determined in an analogous fashion:

$$EC_{PhaseI,y}^{230kV} = \frac{EC_{PhaseI,y}^{13.8kV}}{EC_{PhaseI,y}^{13.8kV} + EC_{PhaseII,y}^{13.8kV}} \cdot EC_{AMAYO,y}^{230kV}$$

where:

$EC_{PhaseI,y}^{230kV}$ is the electricity consumption from the grid by Phase I in period y

$EC_{AMAYO,y}^{230kV}$ is the electricity consumption by the entire wind farm (Phase I&II) in period y ,

$EC_{PhaseI,y}^{13.8kV}$ is the electricity consumption by Phase I in period y as measured on the 13.8 kV internal meters,

$EC_{PhaseII,y}^{13.8kV}$ is the electricity consumption by Phase II in period y as measured on the 13.8 kV internal meters.

Thus, the net electricity generation will be obtained as:

$$EG_y = EG_{PhaseI,y}^{230kV} - EC_{PhaseI,y}^{230kV}$$

Baseline emissions are thus:

Table A – Baseline emissions

Month	Net energy (KWh)	Total Baseline Emissions (tCO ₂ e) (@0.6273 tCO ₂ /MWh)
Apr-2016	6,617,219	4,151
May-2016	9,382,268	5,885
Jun-2016	7,217,255	4,527
Jul-2016	12,958,500	8,129
Aug-2016	7,593,045	4,763
Sep-2016	6,140,812	3,852
Oct-2016	3,030,824	1,901
Nov-2016	7,463,761	4,682
Dec-2016	15,686,473	9,840
Jan-2017	19,063,357	11,958
Feb-2017	15,891,737	9,969
Mar-2017	21,096,575	13,234
Apr-2017	13,273,650	8,327
May-2017	4,962,797	3,113
Jun-2017	4,192,724	2,630
Total	154,570,998	96,962

Table B: Delivery energy

Month	Delivered Energy			
	Phase I, @ 13.8 kV meter (KWh)	Phase II, @ 13.8 kV meter (KWh)	Total wind farm @ 230 kV substation (KWh)	Conservative value ⁸ (kWh)
	<i>EG^{13.8kV}_{PhaseI}</i>	<i>EG^{13.8kV}_{PhaseII}</i>	<i>EG^{230kV}_{AMAYO,y}</i>	<i>EG^{230kV}_{PhaseI}</i>
Apr-2016	6,681,825.0	4,484,976.4	11,089,792.0	6,632,913.3
May-2016	9,522,178.8	6,509,794.3	15,919,104.0	9,451,065.3
Jun-2016	7,348,049.9	5,196,637.6	12,447,872.0	7,287,136.2
Jul-2016	13,065,925.8	9,242,107.2	22,157,952.0	12,967,634.9
Aug-2016	7,726,234.2	5,459,126.3	13,091,456.0	7,663,938.5
Sep-2016	6,272,009.2	4,581,553.3	10,762,880.0	6,205,650.9
Oct-2016	3,149,884.0	2,260,837.1	5,352,466.4	3,111,940.3
Nov-2016	7,582,798.7	5,150,500.5	12,586,580.7	7,495,426.5
Dec-2016	15,805,531.60	10,146,744.83	25,788,544.0	15,705,814.8
Jan-2017	19,206,263.7	12,021,288.2	31,033,728.0	19,086,938.4
Feb-2017	16,018,099.3	10,250,629.1	26,101,248.0	15,915,847.6
Mar-2017	21,234,175.1	13,502,287.0	34,523,008.0	21,103,089.7
Apr-2017	13,401,074.2	8,554,995.3	21,814,656.0	13,314,125.4
May-2017	5,098,205.4	3,755,134.5	8,775,936.0	5,050,693.8
Jun-2017	4,337,741.0	3,154,215.0	7,426,816.0	4,297,059.5
Total in kWh	156,449,996.0	104,270,826.8	258,872,039.2	155,289,274.9
Total in MWh	156,449.99	104,270.83	258,872.04	155,289.27

Table C: Received Energy

Month	Received Energy			
	Phase I, @ 13.8 kV meter (KWh)	Phase II, @ 13.8 kV meter (KWh)	Total wind farm @ 230 kV substation (KWh)	Conservative value ⁹ (kwh)
	<i>EC^{13.8kV}_{PhaseI}</i>	<i>EC^{13.8kV}_{PhaseII}</i>	<i>EC^{230kV}_{AMAYO,y}</i>	<i>EC^{230kV}_{PhaseI}</i>
Apr-2016	11,750.4	8,376.7	26,882.8	15,694.5
May-2016	24,134.0	20,239.4	68,797.0	68,797.0
Jun-2016	22,843.6	20,117.1	69,880.8	69,880.8
Jul-2016	5,837.8	3,462.5	9,134.8	9,134.8
Aug-2016	26,954.7	20,476.9	70,893.5	70,893.5
Sep-2016	26,424.5	19,945.6	64,839.0	64,839.0
Oct-2016	35,642.4	30,057.4	102,672.3	81,116.5
Nov-2016	20,077.1	16,692.5	57,992.9	31,665.5
Dec-2016	6,690.3	5,856.4	19,341.5	19,341.5
Jan-2017	7,134.2	6,252.4	23,581.3	23,581.3
Feb-2017	7,704.7	7,043.2	24,110.3	24,110.3
Mar-2017	4,200.0	2,304.7	6,514.8	6,514.8
Apr-2017	15,518.1	11,954.2	40,475.5	40,475.5
May-2017	33,687.2	26,654.4	87,896.5	87,896.5

8 Conservative value for delivered energy of the project between invoices and spreadsheet calculation.

9 Conservative value for consumed energy of the project between DTE (economic transaction document) and spreadsheet calculation.

Jun-2017	35,745.1	31,099.9	104,335.3	104,335.3
Total in kWh	284,344.3	230,533.2	777,347.9	718,276.5
Total in MWh	284.34	230.53	777.35	718.28

E.2. Calculation of project emissions or actual net removals

There are no project emissions attributable to wind projects. Consequently $PE_y = 0$.

E.3. Calculation of leakage emissions

There is no leakage attributable to wind projects. Consequently $L_y = 0$.

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	96,962	0	0	0	96,962	96,962

According to ACM0002 (version 16), emission reductions are given by:

$$ER_y = BE_y - PE_y - L_y$$

Table D –Emission reductions

Month	Net energy (KWh)	Total Baseline Emissions (tCO ₂ e) (@ 0.6273 tCO ₂ /MWh)	Total Project Emissions (tCO ₂ e)	Total Leakage	Total Emission Reductions (tCO ₂ e)
Apr-2016	6,617,219	4,151	0	0	4,151
May-2016	9,382,268	5,885	0	0	5,885
Jun-2016	7,217,255	4,527	0	0	4,527
Jul-2016	12,958,500	8,129	0	0	8,129
Aug-2016	7,593,045	4,763	0	0	4,763
Sep-2016	6,140,812	3,852	0	0	3,852
Oct-2016	3,030,824	1,901	0	0	1,901
Nov-2016	7,463,761	4,682	0	0	4,682
Dec-2016	15,686,473	9,840	0	0	9,840
Jan-2017	19,063,357	11,958	0	0	11,958
Feb-2017	15,891,737	9,969	0	0	9,969
Mar-2017	21,096,575	13,234	0	0	13,234
Apr-2017	13,273,650	8,327	0	0	8,327
May-2017	4,962,797	3,113	0	0	3,113
Jun-2017	4,192,724	2,630	0	0	2,630
Total	154,570,998	96,962	0	0	96,962

A project's emissions reduction for any year y is calculated as the difference between baseline and project emissions, the latter of which includes any leakage attributable to the project. As there are no project emissions or leakage attributable to wind projects, the total emissions reductions of the Amayo Wind Farm are identical to the estimated baseline emissions.

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO₂e)	Amount estimated ex ante (t CO₂e)
96,962	129,640 ¹⁰

E.6. Remarks on increase in achieved emission reductions

Actual emissions reduction achieved during this monitoring period are lower than the values estimated in ex-ante calculation of registered PDD (version 6).

¹⁰ According to PDD version 6, the amount of GHG emission reductions for a year is 106,335, therefore for a monitoring period of fifteen months, the amount is 129,640.1 (106,335CERs / 12mo = 8,861.3 CERs/mo * 14.63mo = 129,640.1 CERs).

Attachment. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☒ Project participant ☒ Responsible person/ entity for completing the CDM-MR-FORM
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Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Shell Trading International Limited
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