



Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	La Venta II
Reference number of the project activity	0846
Version number of the monitoring report	1
Completion date of the monitoring report	08/02/2013
Registration date of the project activity	25/06/2007
Monitoring period number and duration of this monitoring period	Monitoring Period 5 1/01/2012 – 31/12/2012
Project participant(s)	Comisión Federal de Electricidad (CFE) International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund (SCF)
Host Party(ies)	Mexico
Sectoral scope(s) and applied methodology(ies)	1 : Energy industries (renewable - / non-renewable sources) ACM0002 ver. 6 - Consolidated methodology for grid-connected electricity generation from renewable sources
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	192,545 tCO ₂
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	114,901 tCO ₂

SECTION A. Description of project activity**A.1. Purpose and general description of project activity**

The project's purpose is renewable electricity generation to be supplied to the Interconnected Mexican National Grid (IMNG). The project is expected to displace 192,545 tons of carbon dioxide equivalent (tCO₂e) per year, which will account to 1,347,815 tCO₂e for the first crediting period (7 years), generating the equivalent amount of greenhouse gasses emissions reductions (ERs). As per the registered PDD, the project's greenhouse gasses (GHG) emissions are negligible, thus there is no need to monitor leakage and it is not taken into account when calculating the ERs.

La Venta II wind power plant (La Venta II) consists of 98 wind turbine-generator engines (WTGs) each of 0.85 MW capacity, adding up to a total installed capacity of 83.3 MW. The WTGs are distributed in 4 rows approximately 600 meters away from each other. The WTGs are approximately 130 meters away from each other; the height of the WTGs is 44 meters. The maximum estimated generation is 307,728 MWh.

The project was fully commissioned on January 5, 2007, and has been in continuous operation since then. Total emission reductions for this monitoring period are 114,901 tCO₂e.

A.2. Location of project activity

- (a) Mexico
- (b) Southern State of Oaxaca
- (c) Ejido La Venta, Juchitan de Zaragoza Municipality
- (d) Latitude 16.59 and Longitude -94.819722

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 if the Party involved wishes to be considered as project participant (Yes/No)
Mexico (host)	Comisión Federal de Electricidad (CFE)	No
Spain	International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund (SCF)	Yes

A.4. Reference of applied methodology

ACM0002, version 6, Consolidated baseline methodology for grid-connected generation from renewable sources

A.5. Crediting period of project activity

Type: Renewable crediting period

Starting date: 01/07/2007

Duration: 7 years 0 months

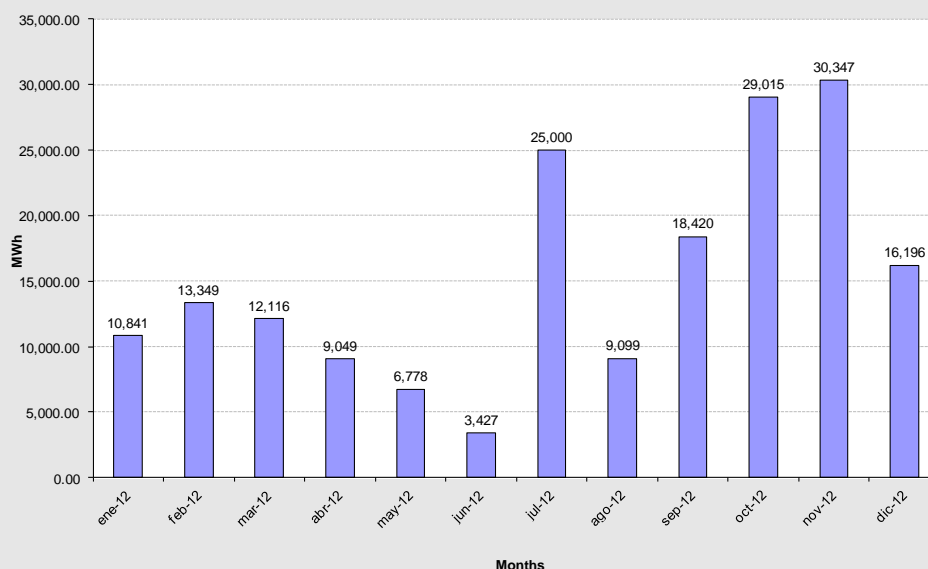
SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

Implementation Status

La Venta II was commissioned on January 5th, 2007, and it has been in continuous operation since then. During this monitoring period La Venta II net generation registered at 34.5 kV was 183,636 MWh. The chart below shows the monthly generation, which varied mainly due to the variability of the wind regimes.

Fig. 1. Monthly Electricity Generation



There were no events that occurred during the current monitoring period that would impact the applicability of the methodology.

In terms of events that impacted negatively the electricity production, the turbine generators were affected by at least one of the following:

- Wind speed outside the operating margin (4 – 25 m/s);
- Downtime periods due to maintenances;
- Overhaul time due to damage in the wings (due to lighting strikes or fatigue);
- Disconnection from the grid by the system operator (CENACE) to balance demand and supply.

These events lead to an increase in the number of downtime hours. The ER calculations reflect these events.

Description of the Installed Technology

La Venta II has a total installed capacity of 83.3 MW and consists of 98 Gamesa G52 wind turbines with 850 kW of rated capacity installed in towers of 44 meters high. Each rotor has a diameter of 52 meters with 3 blades of 25.3 meters long each. The WTGs are distributed in 4 rows about 600 meters away from each other and each WTG is approximately 130 meters away from the adjacent ones.

The cut-in and cut-out wind speeds for these wind turbines are 4 m/s and 25 m/s respectively (for a wind density of 1.225 kg/m³). The output voltage of each generator is 690 V. The voltage is increased from 690 V to 34.5 kV through a transformer located in each of the towers of the wind turbines before sending the electricity to the substation. The wind farm is integrated by 5 electric circuits which collect the electricity generated by the 98 WTGs and sends it to La Venta II substation. The total generated electricity is delivered to the grid and commercialized by CFE, which is the project developer, operator and owner of La Venta II. La Venta II's minimum expected plant operating life is 21 years.

B.2. Post registration changes**B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

N/A

B.2.2. Corrections

N/A

B.2.3. Permanent changes from registered monitoring plan or applied methodology

N/A

B.2.4. Changes to project design of registered project activity

N/A

B.2.5. Changes to start date of crediting period

N/A

B.2.6. Types of changes specific to afforestation or reforestation project activity

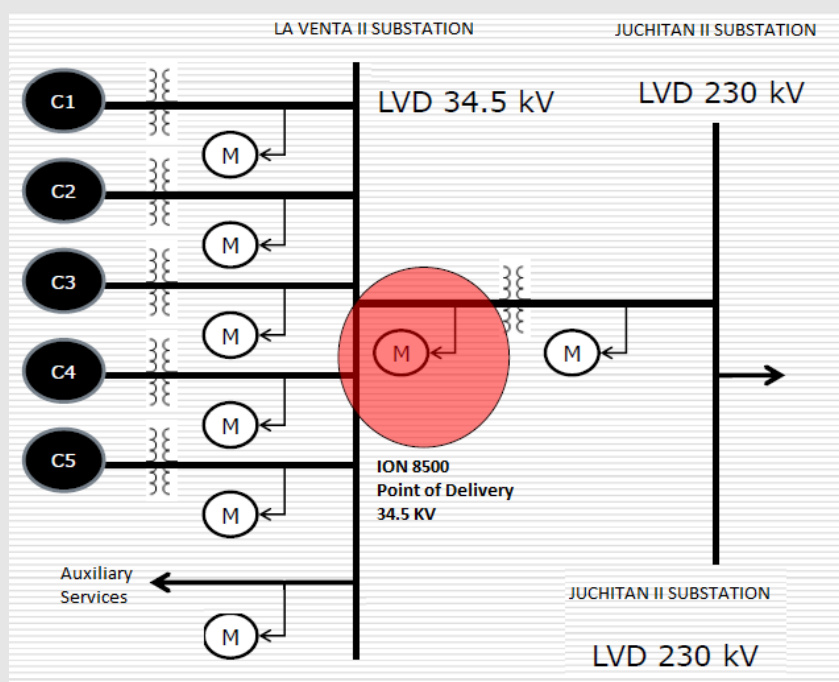
N/A

SECTION C. Description of monitoring system

As per the registered PDD, the only parameter to be monitored for the ERs calculation is La Venta II's electricity generation.

The PDD specifies that Centro Nacional de Control de Energia (CENACE, the system operator) will be the solely provider of La Venta II's generation data. The hourly measurements of the electricity generated by La Venta II are recorded by CENACE from the ION 8500 meter located in La Venta II substation (serial number PQ-0604A002-03).

Fig. 2. One line diagram and monitoring point

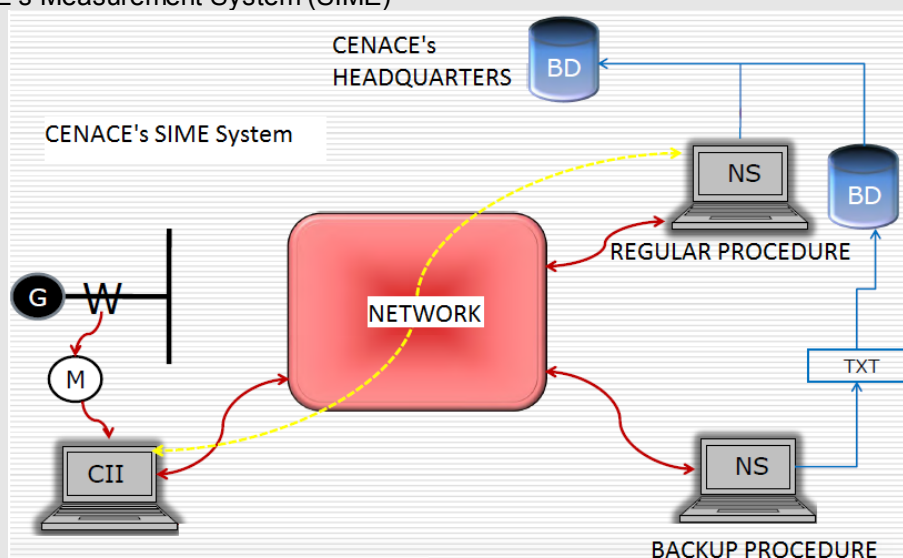


CENACE's measurement system for the electricity delivered by La Venta II is named Sistema Integral de Medicion (SIME, Integral Measurement System). This is a very reliable system that uses the communication

Protocol DNP 3.0. The hourly measurements are stored in a concentrator named Concentrador de Informacion de Instalacion (CII), placed at La Venta II substation. This concentrator also sends the hourly generation information to a regional concentrator named Nodo Secundario (NS), placed in CENACE's Area de Control Oriental in Puebla (CENACE's control office for the western area of Mexico, several hundred kilometers away). Three times per day NS extracts from its local database the hourly generation of La Venta II and stores the information in a file named Hoja de Marcha. The Area de Control Oriental sends the information to CENACE headquarters in Mexico City, where it is stored in a file named Balance Diario de Energía (BD, daily balance).

In case of a transmission failure of the files to CENACE, there is a backup procedure to transfer the data in a text format. All servers at CENACE are protected through firewalls and antivirus software to prevent attacks from external sources.

Fig. 3. CENACE's Measurement System (SIME)



The ION 8500 meter is subjected to regular maintenance and testing regime, which includes:

- Daily monitoring by Internet, and in real time, of the power, tension and other variables;
- Processing per month the historical record of the generation measured by the meter;
- A monthly energy balance per installation;
- Cleaning of the meter and turning of the screws further if they needed to.

With these checks it is possible to detect any errors that the meters may be presenting.

All monitored data will be archived up to two years after the end of the crediting period of the project.

Data Crosschecking

According to CFE, there are no receipts of sales of the energy generated by La Venta II delivered to the next recipient of this energy: CFE Transmission Area. Thus, receipt of sales cannot be used for cross-checking of La Venta's II generation.

Instead, CFE Transmission and Generation Areas conciliate every month the energy delivered by La Venta II at the official point of delivery at 34.5 kV. This conciliation consists of an agreement for the energy delivered from Generation Area to Transmission Area. Every month, both parties sign an official internal document named "Cédula de Registro de Lecturas Mensual" that specifies the amount of delivered. This is the official document used in the cross-checking process.

Roles and Responsibilities

As per the registered PDD, CFE has a Emissions Reduction Calculation Procedure (ERCP) with a defined

organizational structure for La Venta II Project. This also includes a Quality Assurance and Control procedures in line with CDM requirements.

Fig. 4. ERCP Organizational Structure

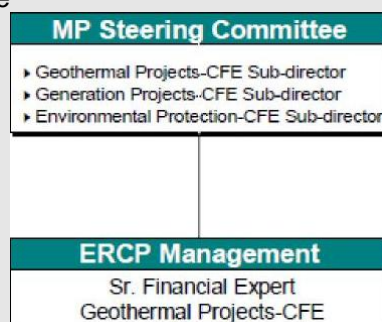


Fig. 5. QA /QC procedures

Data	<ul style="list-style-type: none"> ▶ The project generation data. ▶ Make coordination with CENACE to be able to implement this document. ▶ Check calibration of electricity meters, periodically.
Quality of Data Collection	<ul style="list-style-type: none"> ▶ Which data comes? The above ▶ By what means does it come? By E-mail/ CD ▶ How does it come? In Excel ▶ How frequently does it come? Yearly ▶ From whom does it come? From CENACE ▶ To whom does it come? ERCP Manager
Quality of Data Processing	<ul style="list-style-type: none"> ▶ Original Data ▶ Organized Data ▶ Entered Data ▶ Processed Data ▶ Result
Quality of Data Storage	<ul style="list-style-type: none"> ▶ Prevent Excel versioning problem, by keeping "a new" Excel software package. ▶ Keep all data for 2 years after the first crediting period (9 years). ▶ Save the ERCP file with the last date in which an alteration was made. ▶ Keep all written documentation in a folder.
Quality of Data Delivery	<ul style="list-style-type: none"> ▶ Provide to the verifier e-mails /CD through which the data provider (CENACE) delivered the original data ▶ Provide to the verifier receipt of sales to final clients ▶ Provide to the verifier all calculations made (all steps of data processing) by showing all preliminary versions of spreadsheets saved in disk

Roles and responsibilities for the monitoring and reporting activities are divided among the different areas of CFE, as follows:

CFE Generation Area at La Venta II

- General operation of the plant.
- Preparation of the "Cédula de Registro de Lecturas Mensual".

CFE Transmission Area at La Venta II Substation

- Calibration and maintenance of the meters.
- Validation of the information in the "Cédula de Registro de Lecturas Mensual" (Data Cross-Checking process for the energy delivered to the grid).

CFE CENACE

- Operation and maintenance of SIME system.
- Measurement of the electricity delivered by La Venta II.

CFE Geothermal Projects Area

- Data gathering from CENACE, Generation and Transmission Areas.
- Quality control of the information provided.
- Calculation of the project GHG emission reductions.
- Data processing and preparation of the Monitoring Report.

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

Data / Parameter:	EF_{GRID}
Unit:	tCO ₂ /MWh
Description:	Grid Emission Factor
Source of data:	Registered PDD
Value(s) applied:	0.62570
Purpose of data:	Baseline emissions
Additional comment:	N/A

D.2. Data and parameters monitored

Data / Parameter:	EGy
Unit:	MWh
Description:	Electricity generation of the Project delivered to grid (net of internal consumption at La Venta II)
Measured/ Calculated / Default:	Measured
Source of data:	Plant data (La Venta II and CENACE)
Value(s) of monitored parameter:	183,636.7
Monitoring equipment:	Name: power meter Type: ION 8500 Accuracy Class: 0.2 Serial Number: PQ-0604A002-03 Calibration Frequency: Once a year Date of last calibration: 20/11/2012 Validity: 19/11/2013 Previous calibration: 13/11/2012
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording.
Calculation method (if applicable):	N/A

QA/QC procedures:	The metering equipment is properly calibrated and checked periodically for accuracy. To guarantee QA/QC CFE Transmission and Generation Areas conciliate every month the energy delivered by La Venta II. This cross-checking process consists of an official agreement stating the energy delivered from Generation Area to Transmission Area. Both parties sign an official internal document named "Cedula de Registro de Lecturas Mensual". The conciliation is done comparing the energy measured at La Venta II ION 85000 meter located on the 34.5kV side and the information collected by CENACE.
Purpose of data:	Baseline emissions
Additional comment:	

D.3. Implementation of sampling plan

Not applicable; the PDD does not contain a sampling plan.

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

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

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

Baseline emissions for the Project are calculated by using the formula:

$$BE_y = EG_y \times EF_{GRID}$$

$$= 183,636 \text{ MWh} \times 0.62570 \text{ tCO}_2\text{e/MWh} = 114,901 \text{ tCO}_2\text{e}$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

EG_y = Electricity generation delivered to grid, net of internal consumptions at La Venta II (MWh)

EF_{GRID} = Grid emission factor (tCO₂/MWh).

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

There are no project emissions (PE_y) for the project activity as per the registered PDD.

E.3. Calculation of leakage

There are no leakage emissions (LE_y) for the project activity as per the registered PDD.

E.4. Summary of calculation of emission reductions or net anthropogenic 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)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	114,901	0	0	114,901

E.5. Comparison of actual emission reductions or net anthropogenic 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
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Emission reductions or GHG removals by sinks (t CO₂e)	192,545	114,901
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E.6. Remarks on difference from estimated value in registered PDD

There total emissions reductions for the period are lower than the ex-ante calculations due to lower energy productions during the monitored period. This was mainly due to the variability of the wind and the following:

- Downtime periods due to general maintenance and performance tests;
- Overhaul time due to damage in the wings (due to lighting strikes or fatigue); and
- Disconnection from the grid by the system operator (CENACE).

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO₂e)	N/A	N/A

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