

MONITORING REPORT FORM (CDM-MR)
Version 01 - in effect as of: 28/09/2010

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MONITORING REPORT
Version 1 - 23/02/2012

La Venta II
UNFCCC Reference No. 0846
4th Monitoring Report
(01/01/2011 - 31/12/2011)

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

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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"). 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, which add up to 83.3 MW total capacity. 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 ("megawatts hours"). The project was fully commissioned on January 5, 2007, and has been in continuous operation since that date.

The emissions reductions achieved in this monitoring period (01/01/2011 - 31/12/2011) have been 63,298 tCO₂e.

A.2. Project Participants

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Name of Party involved (*) (host) indicated a host Party)	Private and/or public entity (ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
México (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.3. Location of the project activity:

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The project is located in the Southern State of Oaxaca, in the Municipality of Juchitan de Zaragoza, in the Ejido La Venta. The project site is 30 km northeast from Juchitan de Zaragoza City (capital of the Municipality of Juchitan de Zaragoza) and 310 km southeast from Oaxaca City capital of the state. The site coordinates are Latitude: **16.59** Longitude: **-94.819722**.

A.4. Technical description of the project

>> La Venta II wind power plant ("La Venta II") consists of 98 wind turbine-generator engines ("WTGs") each of 0.85 MW capacity, which add up to 83.3 MW total capacity. 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 spatial extent of La Venta II boundary is the Integrated Mexican National Grid (“IMNG”). La Venta II is integrated by 5 electric circuits which collect the energy generated by the 98 WTGs and send it to the substation of the plant named La Venta II substation. The total expected generated electricity is delivered to the grid and commercialized by CFE, which is the developer, operator and owner of La Venta II. La Venta II’s minimum expected plant operating life is 21 years. The one line diagram is shown in figure 2, at Section C.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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

Methodology Used : ACM0002 ver. 6 - Consolidated methodology for grid-connected electricity generation from renewable sources

Reference: <http://cdm.unfccc.int/methodologies/view?ref=ACM0002>

As per the registered PDD, the use of additional tools is not required.

A.6. Registration date of the project activity:

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The project was registered on 25 June 2007 with a renewable crediting period of 7 years.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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Start date of the crediting period is 01/07/2007. The crediting period for the project has been considered as renewable 7 years and no changes to the start date of the crediting period post-registration were proposed.

A.8. Name of responsible person(s)/entity(ies):

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Eng. Carlos Sánchez Cornejo
Geothermal Projects Division
Comisión Federal De Electricidad
Alejandro Volta 655 Colonia Electricistas
Morelia, Michoacan 58290, Mexico
Tel. no.: +52 443 322 7036
Fax: +52 443 322 7010
Email: carlos.sanchez04@cfe.gob.mx

Javier Freire Coloma
Carbon Finance Unit
World Bank (IBRD)
1818 H Street NW
Washington, DC 20433, USA
Tel. no.: + 1 202 458 8156
Fax: + 1 202 522 7432
Email: jfreirecoloma@worldbank.org

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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La Venta II was commissioned on January 5th, 2007, and it has been in continuous operation since then. During the period covered in the fourth monitoring report (January 1st, 2011 to December 31st, 2011), La Venta II net generation registered at 34.5 kV by CENACE was 101,165MWh. The chart below shows the monthly generation, which varied mainly due to the variability of the wind regimes.

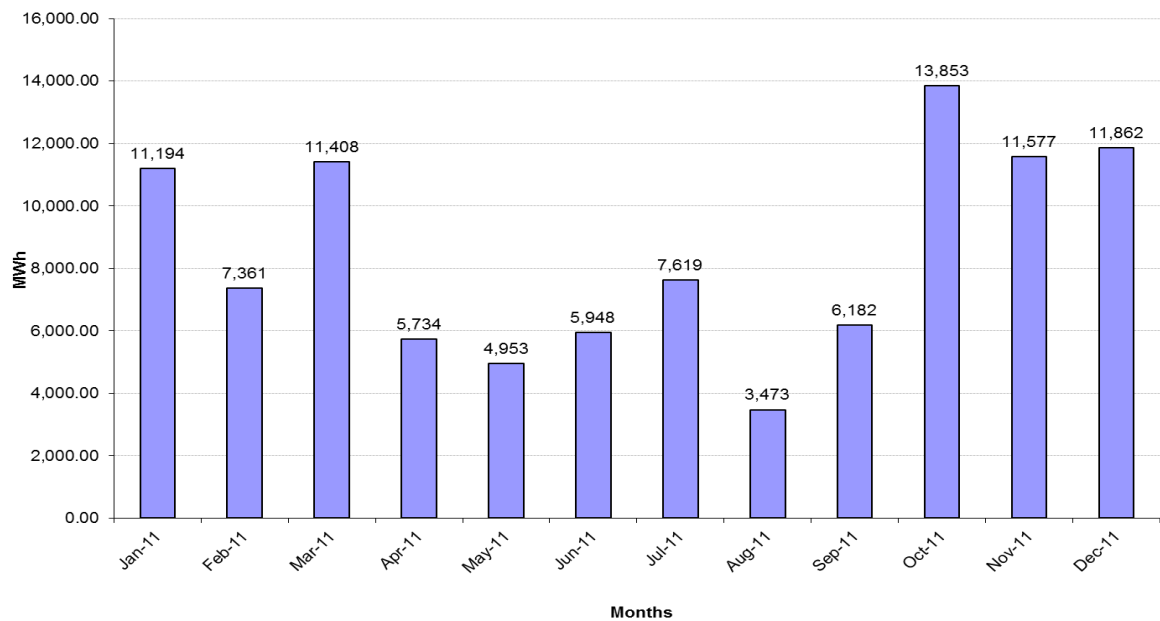


Figure 1.- La Venta II Net Generation at 34.5 kV (Jan 11 – Dec 11)

There were no events or situations during the monitoring period that could 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 caused for failures in electromechanical system;
- Overhaul time due to damage in the wings (due to lightning 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. La Venta II currently has a maintenance program for short-term recovery the generation levels obtained during the first years of operation.

B.2. Revision of the monitoring plan

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The monitoring plan has not been revised.

B.3. Request for deviation applied to this monitoring period

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No request for deviation has been applied to this monitoring period.

B.4. Notification or request of approval of changes

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No notification or request of approval of changes from the project activity as described in the registered CDM-PDD has been made.

SECTION C. Description of the monitoring system

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Emissions Reductions Calculation Procedure (“ERCP”)

Following ACM0002-Version 6, the emission reductions (“ERs”) calculation is the emission factor (“EF”) times the electricity generation delivered to the IMNG. In the PDD, the EF for La Venta II was established at 0.62570 tCO₂e/MWh, and is to be kept fixed for the first crediting period. Therefore the only parameter to be monitored for the ERs calculation is La Venta II’s electricity generation.

Source and Data Reliability

In La Venta II Design Document (“PDD”) it is specified that Centro Nacional de Control de Energia (“CENACE”) will be the solely provider of La Venta II’s generation. The hourly measurement of the electricity generated by La Venta II that is recorded by CENACE is obtained in the ION 8500 meter located in La Venta II substation (see Figure 2). The features of this meter, which will be used for the ERs calculation, are as follow:

Voltage (L-L) (L-N)	0.1%
Frequency (47 - 63Hz)	±0.01Hz
Current (I1, I2, I3)	0.1% + 0.002%
Current (I4)	0.4%
kW, kVAR, kVA (Unity PF)	0.2% + 0.001%
kW, kVAR, kVA (±0.5 PF)	0.3% + 0.003%
kWh, kVARh, kVAh Class	0.2
Power Factor at Unity PF	0.5%
Harmonics (to 63rd)	1%
Harmonics (to 40th)	IEC 61000-4-7
K Factor	5%
Crest Factor	1% Full Scale

This meter registers the hourly generation at 34.5 kV.

One Line Diagram of La Venta II Power Station.

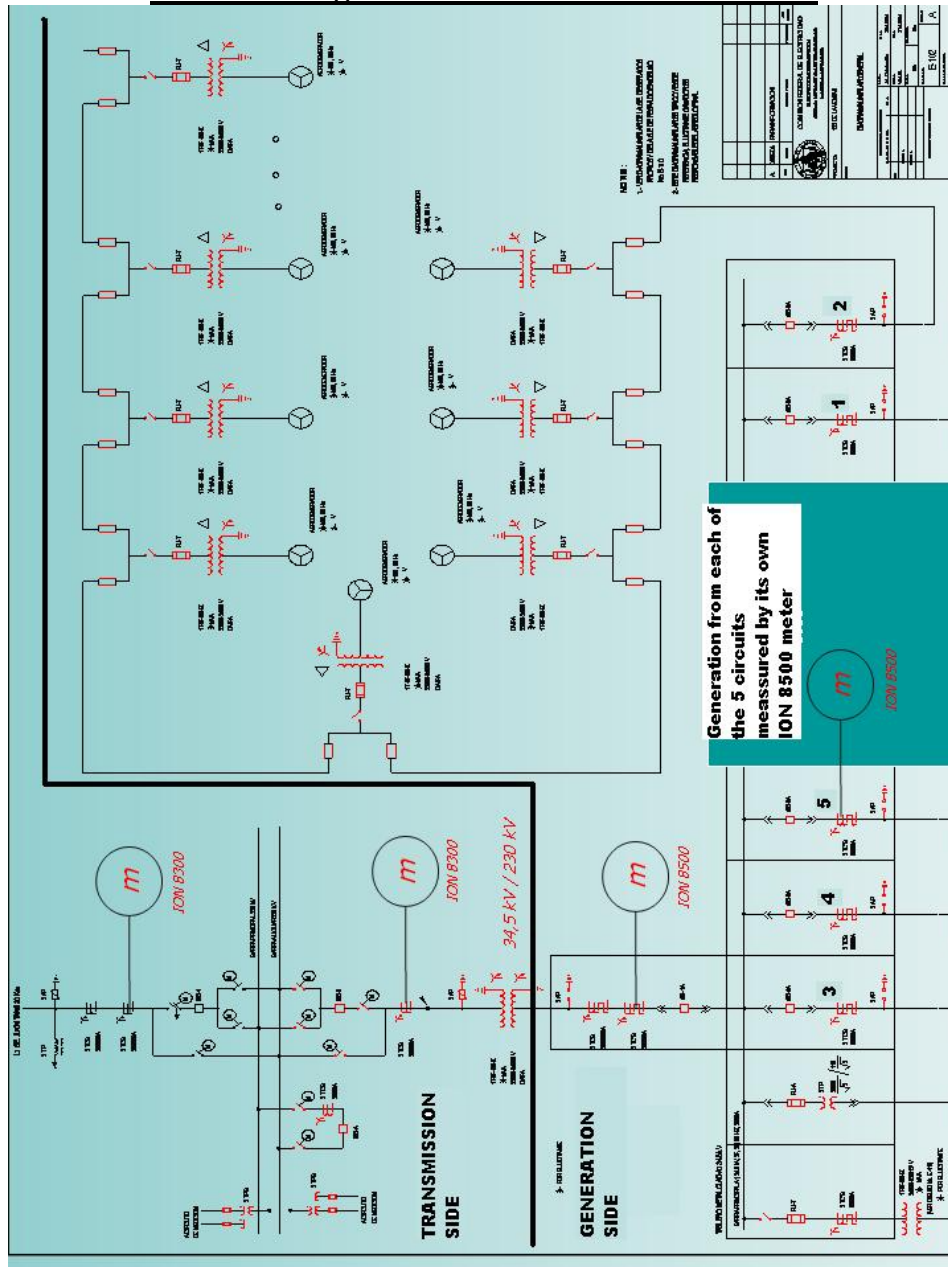


Figure 2.- One Line Diagram of La Venta II Power Station indicating the location of ION8500 in the 34.5kV side. Source: CENACE

The measurement system in La Venta II is named Sistema Integral de Medicion (SIME), which uses the communication Protocol DNP 3.0. The hourly measurement is stored in a concentrator placed in the same substation named Concentrador de Informacion de Instalacion ("CII"), this concentrator aside from recording the hourly generation sends the hourly generation information to a regional concentrator named Nodo Secundario, placed in Area de Control Oriental in Puebla . Three times per day the Nodo Secundario extracts from its local base the hourly generation of La Venta II data and stores the information in a file named Hoja de Marcha. The Area de Control Oriental sends the information to CENACE in Mexico City, where it is stored in a file named Balance de Energía.

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.

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: Transmission Area of CFE. Thus, receipt of sales cannot be used for cross-checking of La Venta's II generation. According to CFE, there is not any type of document (replacing a receipt of sales but it is treated as an internal CFE transaction) given by the Transmission Area of CFE to the Generation Area of CFE confirming the receipt of a certain quantity of energy delivered by La Venta II, so the only assurance the Transmission Area counts with of having received a specific quantity of energy from La Venta II is the measurement of such energy in the Generation Area meter placed in La Venta II at 34,5 kV (below specified). Therefore, this latter meter is taken for data crosschecking.

CFE Transmission and Generation Areas every month conciliate the energy generated by La Venta II at 34,5 kV, it consists in an agreement for the energy delivered from Generation Area to Transmission Area. They sign an official internal document named "Cédula de Registro de Lecturas Mensual". This document will be used in the cross-checking process (see table below). The table below shows the cross check between values for the Net Generation¹ (generation from each of the 5 circuits at 34.5kV) as measured by CENACE and the values measured by La Venta II in "Cédula de Registro de Lecturas Mensual".

La Venta II's Generation at 34.5 kV (MWh) Monthly Cross-Check

	CENACE Net Generation	CEDULA Net Generation	Difference, %
Jan-11	11,194	11,194	0
Feb-11	7,361	7,361	0
Mar-11	11,408	11,408	0
Apr-11	5,734	5,734	0
May-11	4,953	4,953	0
Jun-11	5,948	5,948	0
Jul-11	7,619	7,619	0
Aug-11	3,473	3,473	0
Sep-11	6,182	6,182	0
Oct-11	13,853	13,853	0
Nov-11	11,577	11,577	0
Dec-11	11,862	11,862	0
	101,164	101,164	0

Source: CENACE, Transmission and Generation Areas.

As per DOE request and for the purpose of double-checking the above information, the net table compares the Net Generation measured at 34.5 kV and the difference of the Gross Generation², as the sum of each of the 5 independent circuits, less the auxiliary consumptions³ at La Venta II Substation.

¹ Net Generation = electricity delivered to the grid net of internal consumptions at the plant and distribution and transformation losses from the generators to La Venta II Substation.

² Gross Generation = electricity from each of the 5 circuits at 34.5kV.

³ Auxiliary Consumptions = internal consumptions at La Venta II.

Monthly Energy Balance versus Measured Net Generation (MWh) at 34.5 kV

	A Gross Generatio (5 circuits)	B Auxiliary Consumption (1 circuit)	C = A – B Energy Balance (calculated)	D Net Generation (main circuit)	E = (C-D)/D Difference %
Jan-11	11,253.20	24.60	11,228.60	11,193.60	0.31%
Feb-11	7,410.37	19.02	7,391.34	7,361.06	0.41%
Mar-11	11,440.65	26.83	11,413.82	11,408.22	0.05%
Apr-11	5,766.44	25.01	5,741.44	5,733.98	0.13%
May-11	4,993.92	26.66	4,967.26	4,953.13	0.29%
Jun-11	5,973.81	27.70	5,946.11	5,947.61	-0.03%
Jul-11	7,653.33	28.19	7,625.14	7,619.49	0.07%
Aug-11	3,506.72	28.92	3,477.80	3,472.51	0.15%
Sep-11	6,215.52	27.99	6,187.54	6,182.15	0.09%
Oct-11	13,884.34	27.98	13,856.36	13,853.22	0.02%
Nov-11	11,602.69	28.29	11,574.40	11,577.18	-0.02%
Dec-11	11,883.56	29.24	11,854.32	11,862.45	-0.07%
	101,584.56	320.43	101,264.13	101,164.58	0.10%

Source: Transmission and Generation Areas

The table above shows that the calculated energy balance at 34.5 kV for any given month is higher than the measurements done for the Net Generation at the main circuit. This implies that the values used for the cross-checking process are conservative.

ERCP Organizational Structure, Quality Assurance and Control Procedure

ERCP Organizational Structure

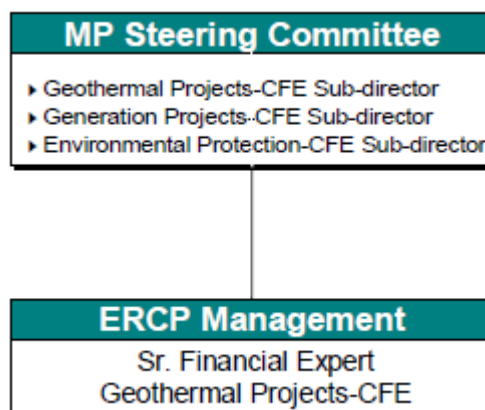


Figure 3.- ERCP Organizational Structure.
Source: World Bank/CFE

ERCP Quality Control

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 comes? 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

Figure 4.- ERCP Quality Control. Source: World Bank/CFE

SECTION D. Data and parameters**D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors**

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Data / Parameter:	
Data unit:	tCO₂/MWh
Description:	Grid Emission Factor
Source of data used:	Registered PDD
Value(s) :	0.62570
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Additional comment:	-

D.2. Data and parameters monitored

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Data / Parameter:	
Data 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:	101,165 MWh
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: Two ION 8500 Power Meters Accuracy class: 0.2 Serial No: PQ-0604A002-03 Calibration frequency: Once a year Date of last calibration: Nov 13, 2011 <i>Validity: Up to Nov 12, 2012</i>
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording.
Calculation method (if applicable):	Not Applicable
QA/QC procedures applied:	CFE Transmission and Generation Areas every month conciliate the energy generated by La Venta II at 34,5 kV, it consists in an agreement for the energy delivered from Generation Area to Transmission Area. They 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. The hourly measurement is stored in a concentrator placed in the same substation named Concentrador de Informacion de Instalacion ("CII"), this concentrator aside from recording the hourly generation sends the hourly generation information to a regional concentrator named Nodo Secundario, placed in Area de Control Oriental in Puebla . Three times per day the Nodo Secundario extracts from its local base the hourly generation of La Venta II data and stores the information in a file

	<p>named Hoja de Marcha. The Area de Control Oriental sends the information to CENACE in Mexico City, where it is stored in a file named Balance de Energía.</p> <p>The calibrations performed to La Venta II's ION 8500 meter, which measures the energy produced at 34.5 kV consisted in:</p> <ul style="list-style-type: none"> -Cleaning of the meter and turning of the screws further if they needed to. -Processing per month the historical record of the generation measured by the meter. -A monthly energy balance per installation. -Daily remotely monitoring (by Internet) and in real time of the power, tension and other variables through a Nodo de Energia. <p>With these checks it is plausible to detect any errors that the meters may be presenting. Calibration certificates are available to the verifier.</p> <p>CFE calibrations to La Venta II are performed by <i>the Laboratorio de Metrología Sureste de la Gerencia Regional de Transmisión Sureste</i>, which is certified by CFE's <i>Laboratorio de Pruebas de Equipos y Materiales (LAPEM)</i>, which is certified by Centro Nacional de Metrología ("CENAM"), which follows various international measurements standards.</p> <p>Monitored data shall be archived for 2 years following the end of the crediting period.</p>
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SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

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Baseline emissions (BEy) for the Project are calculated by using the formula:

BEy = Electricity generation of the Project delivered to grid (net of internal consumption at La Venta II), MWh x Baseline emission factor (tCO₂/MWh)

The ex-ante baseline emission factor as per the registered PDD is: 0.62570 tCO₂/MWh

The values for the electricity supplied to the grid are given below:

MONTH	Net electricity delivered to the grid (MWh)
January-11	11,194
February-11	7,361
March-11	11,408
April-11	5,734
May-11	4,953
June-11	5,948
July-11	7,619
August-11	3,473
September-11	6,182
October-11	13,853
November-11	11,577
December-11	11,862
Total	101,164

From January 1st, 2011 up to December 31st, 2011, the electricity generation of La Venta II (net of internal consumption) was: 101,164 MWh at 34.5 kV. Generation of 101,164 MWh has been considered for the ER Calculation. Baseline emissions are calculated as follow:

$$BE_y = 101,164 \text{ MWh} \times \text{CEFex-ante tCO}_2\text{e/MWh}$$

$$BE_y = 101,164 \text{ MWh} \times 0.62570 \text{ tCO}_2\text{e/MWh}$$

$$BE_y = 63,298 \text{ tCO}_2\text{e}$$

E.2. Project emissions calculation

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

E.3. Leakage calculation

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

E.4. Emission reductions calculation / table

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Total emission reductions (ER_y) = Total baseline emissions (BE_y) - Total project emissions (PE_y) - Total leakage (LE_y)

$$\text{Total baseline emissions (BE}_y) = 63,298 \text{ tCO}_2\text{e}$$

$$\text{Total project emissions (PE}_y) = 0 \text{ tCO}_2\text{e}$$

$$\text{Total leakage (LE}_y) = 0 \text{ tCO}_2\text{e}$$

$$\text{Total emission reductions (ER}_y) = 63,298 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e} = 63,298 \text{ tCO}_2\text{e}$$

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

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Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO ₂ e)	192,545 per year	63,289

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

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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);
- Disconnection from the grid by the system operator (CENACE);

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		

Monitoring Plan Steering Committee:

Ing. Roberto Cadenas Tovar
Gerencia de Proyectos Geotermoeléctricos

Ing. Sergio Rosas D.
Subdirección de Generación

Ing. Federico López de Alba
Gerencia de Protección Ambiental

ERCP Management:

Ing. Carlos Sánchez Cornejo
Gerencia de Proyectos Geotermoeléctricos