Monitoring report form

(Version 04.0)

MONITORING REPORT	
Title of the project activity	Bii Nee Stipa
Reference number of the project activity	0107
Version number of the monitoring report	1
Completion date of the monitoring report	03/10/2014
Registration date of the project activity	25/12/2005
Monitoring period number and duration of this monitoring period	2nd monitoring period (01/09/2011 – 30/05/2014)
Project participant(s)	Gamesa Energía S.A. Impulsora Nacional de Electricidad S. de R.L. de C.V
Host Party(ies)	Mexico
Sectoral scope and selected methodology(ies), and where applicable, applied standardized baseline(s)	Sectoral scope: Energy industries (renewable - / non-renewable sources) Methodology used: ACM0002 ver. 2
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	569,882 tCO2
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	590,820 tCO2
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	146,767 tCO2
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	444,053 tCO2

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>> The purpose of this project activity is to generate renewable energy coming from wind resources, in order to sell it to Mexican partners willing to consume this sort of energy. With this aim, the project activity will reduce greenhouse gas (GHG) emission by avoiding electricity generation otherwise produced at fossil-fuel fired power plants, and thus CO_2 emissions associated to it. The Project is expected to be responsible for reducing 2,057,557 tCO_2 during the crediting period.

The wind farm has a power capacity of 170.35 MW and it is comprised by three phases with different specifications.

Total Power	170.35 MW
Turbine	Phase 1: 31 turbines G52 (850 kW) Phase 2: 37 turbines G80 (2 MW) Phase 3: 20 turbines G87 (2 MW) + 15 turbines G80 (2 MW)
Rated Power per turbine	850 kW - 2000 kW
Rated output Voltage	690V
No. of turbines	31 turbines of 850 kW and 72 turbines of 2 MW

Table 1. Power plant characteristics

The Bii Nee Stipa project environmental impact evaluation (MIA) received the approval by the Mexican environmental institution SEMARNAT for the Phase I (26.35 MW) in July 2008. Then the second MIA was obtained for the Phase II (74 MW) in February 2011. Finally the third MIA for Phase III (70 MW) was issued in January 2012.

Starting operations calendar:

Name	**Power Plant Operating**
Bii Nee Stipa I	26.35 MW on 1st April 2010
Bii Nee Stipa II	74 MW on 1st July 2012
Bii Nee Stipa III	70 MW on 1st January 2013
Cumulative power installed	**170.35 MW**

Table 2. Commissioning calendar

This Monitoring Report is made for the three phases of the wind farm and covers the period from September 1st 2011 to May 30th 2014. The total emission reduction achieved in this monitoring period is of 590,820 tCO2e.

A.2. Location of project activity

>> The project is located in La Ventosa area, in Juchitán de Zaragoza Council, Tehuantepec Isthmus, in the Pacific Coast of Oaxaca State, Mexico.

Figure 1. Project location

The coordinates for the centre of the project will be, Longitude (º) -94.9815 and Latitude(º) 16.5408. Also the perimeter of the wind farm based on its vertex will be:

WTG	Longitude(º)	Latitude(º)
V1	-94.9593	16.5652
V2	-94.9764	16.5612
V3	-95.0040	16.5499
V4	-95.0092	16.5467
V5	-95.0141	16.5376
V6	-95.0124	16.5360
V7	-95.0073	16.5323
V8	-94.9746	16.5170
V9	-94.9689	16.5172
V10	-94.9604	16.5305
V11	-94.9600	16.5430

Table 3. Perimeter of the Project Activity

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)	Gamesa Energia, S.A. (private entity)	NO
	Impulsora Nacional de Electricidad S. de R.L. de C.V (private entity)	NO
Spain	Gamesa Energia, S.A. (private entity)	NO

A.4. Reference of applied methodology and standardized baseline

>> At the time when PDD was registered the next documents were available:

- Approved consolidated baseline methodology ACM0002, "*Consolidated methodology for grid-connected electricity generation from renewable sources"*, version 02.

"https://cdm.unfccc.int/methodologies/DB/M0CSBFOF8RQG5I84XU5Y4WX0I5LHS1"

- For demonstrating its additionality, the "*Tool for demonstration and assessment of additionality*", version 1. (EB 16 Annex 1)

"https://cdm.unfccc.int/EB/archives/meetings_04.html"

A.5. Crediting period of project activity

>> The crediting period in the registered PDD is from January 1st 2007 to December 31st 2016 (ten years fixed). Nevertheless, due to a delay in the construction of the transmission line and substation by CFE, the evacuation line could not be ready on schedule, and a delay of the starting date of the crediting period was requested for 2 years.

The request for delay was approved and the single 10-year crediting period covers the period from 31/12/2008 to 30/12/2018.

A.6. Contact information of responsible persons/ entities

>> CDM Manager: Oswaldo Álvarez García. Organization name: Gamesa Energia, S.A. (Madrid)
See contact information in Appendix 1

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>> The PDD of the project was registered in December 25th 2005 (25/12/2005). The first phase of the project (for which this monitoring report is made) started its operation in April 1st 2010 (01/04/2010). During the monitoring period no special events or situations which could impact the applicability of the methodology have been detected. The commissioning of the 2nd and 3rd phases of the project took place in January 2012 and January 2013 respectively.

The 1st phase of the project involves the installation of 31 G52 turbines of 850 kW of capacity each one, resulting in a total capacity of 26.35 MW for this phase. These wind turbines are manufactured by the Spanish firm GAMESA, and are three-bladed rotor machines, with a rated voltage of generator of 690 V, assuring optimal performance, maximum output from existing wind resource, robustness and reliability. The output transformer of this phase is of 34.5/115 KV and 25/30 MVA. The line to connect this phase to the grid is a 115 kV and 4.8 km long line, from the 1st phase of the wind farm control house to the national grid.

The 2nd phase will consist of 37 G80 wind turbines, with 2 MW of capacity each one (which results in a total capacity of 74 MW for this phase). A 3rd phase is also expected with 20 G87 turbines and 15 G80 turbines, with a total capacity of 70 MW. The commissioning of the second and third phases will be expected for January 1st 2012 and January 1st 2013, and so these two phases have not been generating electricity during this monitoring period.

Next, a simplified diagram of the wind farm is shown:

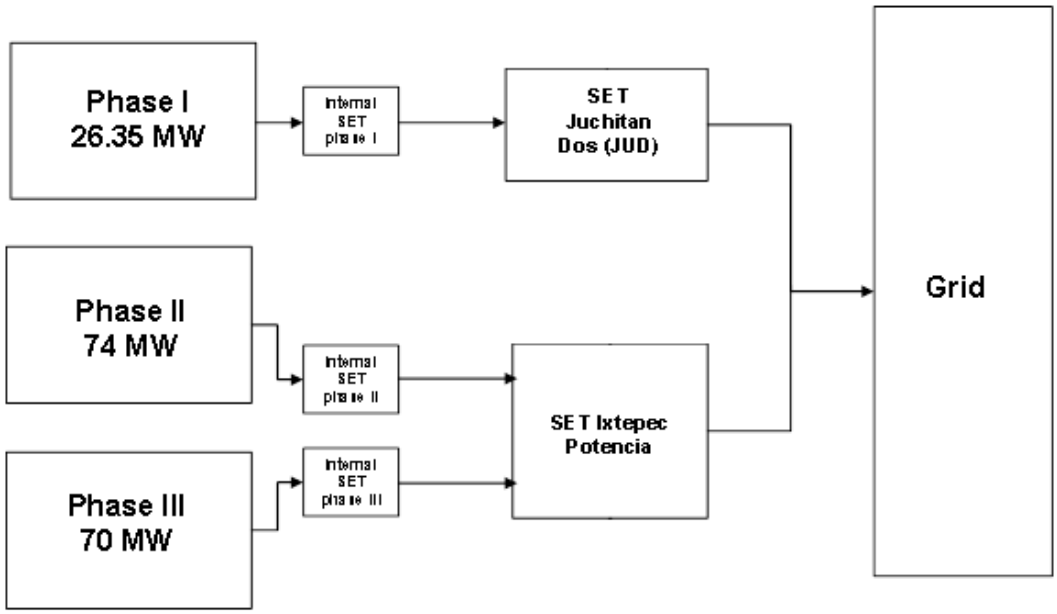

Figure 1. Simplified diagram of the wind farm

SET= Electrical Substation

As it can be seen in Figure 1, the electric lines that evacuate the power generation of the wind farm come to a first electrical substation, inside the wind farm perimeter. Then they come to "Juchitán Dos" electrical substation in the case of Phase I and to "Ixtepec Potencia" electrical substation in the case of Phases II & III, where the power is finally switched to the grid.

B.2. Post registration changes

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

>> N/A

B.2.2. Corrections

>> N/A

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

>> Changes from registered monitoring plan were approved on 13 September 2013 with reference number PRC-0107-001.

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

>> Changes to project design of registered project activity plan were approved on 13 September 2013 with reference number PRC-0107-001.

B.2.5. Changes to start date of crediting period

>> Changes to start date of crediting period were requested and approved. See: http://cdm.unfccc.int/Projects/DB/AENOR1129213791.04/view
The starting date of the initial crediting period was January 1st 2007 (01/01/2007). Due to a delay in the construction of a transmission line and electrical substation by the CFE, the start of operation of the project was inevitably postponed. Therefore, a delay on the start of the crediting period was requested, in a way that this date was moved from January 1st 2007 to December 31st 2008 (31/12/2008). The delay on the start of the crediting period was approved on January 30th 2012.

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

>> N/A

SECTION C. Description of monitoring system

>> As the Mexican power grid relies on a regulated metering setup established by the Federal Electricity Commission (CFE), which is required for the invoicing of power generation, monitoring will be carried out by CFE.

Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project is hence determined on the basis of CFE monthly reports sent by CENACE, and called “Conciliación Mensual” report, in which CFE provides generation data measured by the main meter located at the sub-station. These reports are monthly delivered by email to the responsible person of gathering and analysing this information in the wind farm. Project participant will keep copies of monthly reports as well as bills provided by CFE.

According to methodology ACM0002 no leakage is expected from project activity and projects emissions are equal to 0. The ER will be calculated based on recorded value of electricity generation monitored by CFE periodically checked meters.

Monitoring procedures:

The characteristics of the meters which measure the electricity generation of the farm are shown in the Table 4:

PHASE	METER	TYPE OF METER	SERIES NUMBER	PRECISION CLASS
Phase I	Main meter (1st meter)	Schneider ION 8600	PT-0903A042-01	0.2
	Secondary meter (2nd meter)	Schneider ION 8600	PT-0903A108-01	0.2
Phase II	Main meter (1st meter)	Schneider ION 8600	MT-1108A589-01	0.2
	Secondary meter (2nd meter)	Schneider ION 8600	MT-1108A592-01	0.2
Phase III	Main meter (1st meter)	Schneider ION 8600	MT-1108A590-01	0.2
	Secondary meter (2nd meter)	Schneider ION 8600	MT-1011A454-01	0.2

Table 4. Series numbers of the meters.

The meters meet all the CFE requirements. Measurements are done continuously. The readings of the main meter have been used in the calculations of the emissions reductions (see section E), through CFE monthly reports providing the net amount of electricity provided to the grid.

The parameter EGy is calculated from two sub-parameters included in the monthly CFE reports “Conciliación Mensual”.

1- “ENERGÍA NETA RECIBIDA DE Bii Nee Stipa EN EL PI” (net energy received by CFE from Project Activity) and

2- "ENERGÍA NETA ENTREGADA A Bii Nee Stipa EN EL PI" (net energy delivered by CFE to Project Activity).

EGy = 1 – 2

Data storage and management:

Hourly data provided by CFE are kept archived during the crediting period and for two years after the end of the last crediting period.

Quality Control and Quality Assurance (QC/QA):

The quality of the net generation is assured by carrying out double measurement by means of a main meter and secondary or back-up meter. These meters are located at the entrance of the electrical substation "Juchitán Dos" for the first phase of the project and in the "Ixtepec Potencia" electrical substation in the case of Phases II & III. The meters location is shown in the next figure:

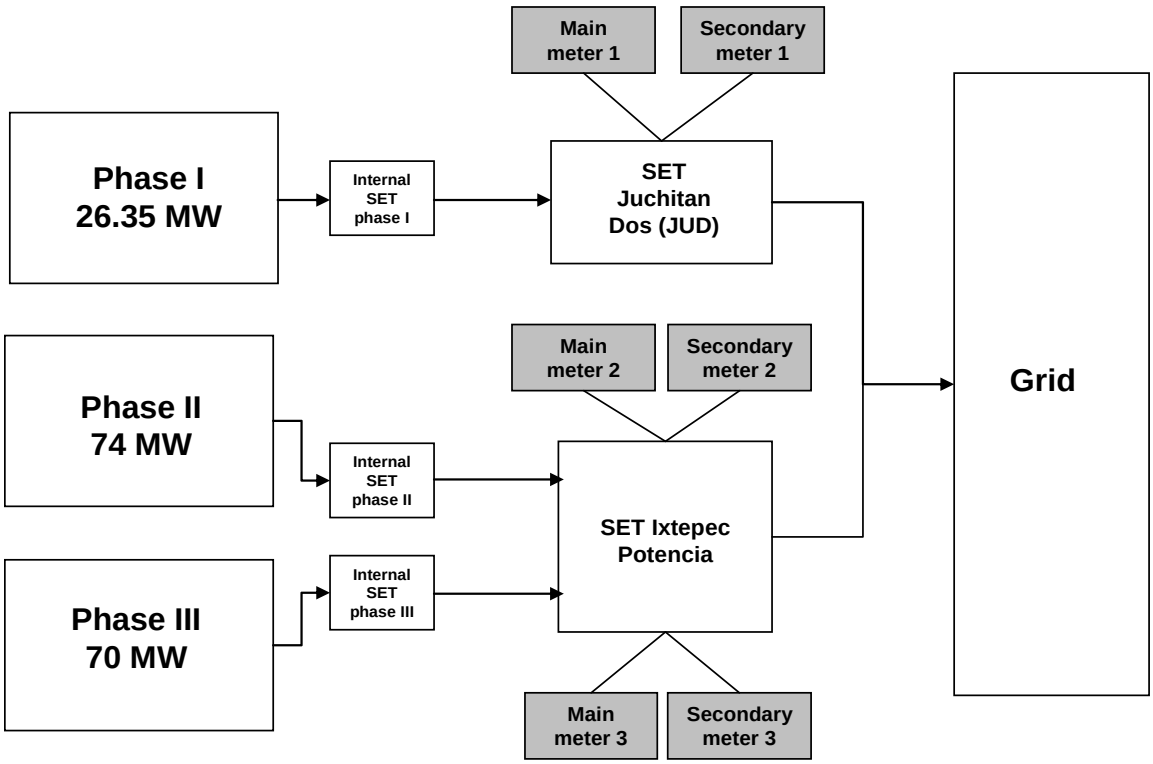

Figure 2. Meters location of the first phase of the project.

Moreover, data provided by CFE monthly reports will be cross checked with CFE bills in order to check data reliability.

Crosscheck of parameter 1 (net energy received by CFE from Project Activity) is done by considering the generation data measured by the main meter located at the sub-station and the sum of all electricity delivered to the clients + the excess of electricity from each month (banked by CFE).

Crosscheck of parameter 2 (net energy delivered by CFE to Project Activity) is done by considering the consumption data of the PA measured by the main meter located at the sub-station and the measurement of the electricity delivered by CFE to the Project Activity.

Organisational structure and responsibilities:

The supervisor of Operation and Maintenance of the wind farm is in charge of receiving, analysing and compiling all CFE monthly reports and bills. This person is also in charge of doing monthly/annual reports regarding the electricity generated by the project.

All these reports (internal and external) shall be sent to the responsible of coordination of CDM projects of Gamesa Energía in Madrid who is in charge of writing the MR as well as baseline calculation. Responsible of coordination of CDM projects of Gamesa Energía in Madrid will carry out an annual internal audit consisting in checking both documents with final data provided for baseline calculations. The CDM supervisor will check and approve monitoring report.

The responsibilities structure is shown in the Figure 3:

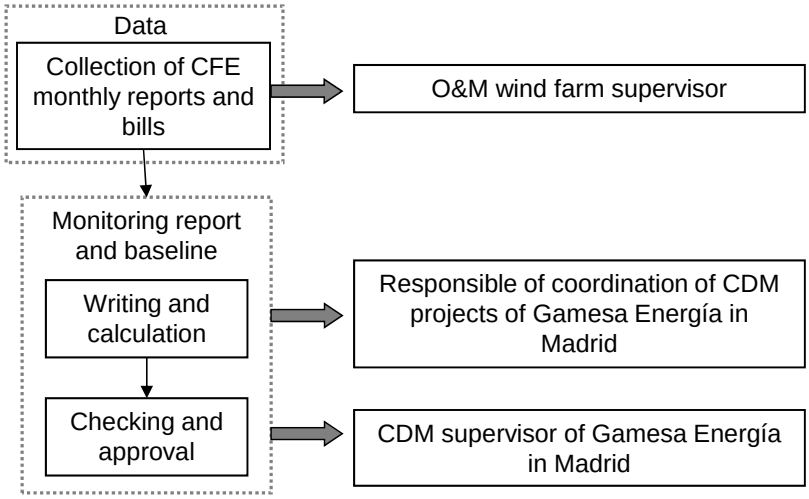

Figure 3. Monitoring responsibilities structure.

Calibration:

Periodic calibration has been carried out in both main and secondary meters with positive results. Last calibration was held in 13/09/2013, showing that power meters are working correctly.

CFE is the only responsible and authorized entity to have access to the meters and hence, is in charge of meters calibration.

Training:

Monitoring of electricity delivered to the grid is carried out by CFE which is the only that can read electricity meters.

Wind farm staff is trained for operation and maintenance works, as well as monitoring procedures in order to be able to read CFE reports and register electronically the provided data.

Emergency procedure:

Monitoring will be carried out by CFE and project participant will keep copies of the monthly reports which provide net generation supplied to the grid data necessary for calculations and bills for checking data.

In the cases of failure of the main meter, back up meter would be used for power generation measurements while the grid officials would immediately replace the main meter with a new calibrated meter. If both main and back up meters would fail, CFE is expected to carry out a conservative and reliable estimation. It should be pointed that, from the beginning to the end of the monitoring period, no failure of the meters occurred.

SECTION D. Data and parameters

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

>> N/A

D.2. Data and parameters monitored

Electricity generation:

<table>
<tr><td>Data / Parameter: 1</td><td>EG_y</td></tr>
<tr><td>Unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>Electricity supplied by the project activity to the grid during the monitoring period (September 1st 2011-May 30st 2014).</td></tr>
<tr><td>Measured/ Calculated / Default:</td><td>Measured</td></tr>
<tr><td>Source of data:</td><td>CFE monthly reports providing readings of the main meters located at the two electrical substations. All data were monitored and electronically archived.</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>1,087,003 MWh</td></tr>
<tr><td>Monitoring equipment:</td><td>Electricity meters</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>The power meters are annually calibrated by the CFE.

Phase 1:
<table>
<tr><th>Meter</th><th>Type and serial number</th><th>Accuracy class</th><th>Calibrations</th></tr>
<tr><td>Main meter</td><td>Schneider ION 8600 (PT-0903A042-01)</td><td>0.2%</td><td>-</td></tr>
<tr><td>Back-up meter</td><td>Schneider ION 8600 (PT-0903A108-01)</td><td>0.2%</td><td>-</td></tr>
</table>
Phase 2:
<table>
<tr><th>Meter</th><th>Type and serial number</th><th>Accuracy class</th><th>Calibrations</th></tr>
<tr><td>Main meter</td><td>Schneider ION 8600 (MT-1108A589-01)</td><td>0.2%</td><td>13/09/2013</td></tr>
<tr><td>Back-up meter</td><td>Schneider ION 8600 (MT-1108A592-01)</td><td>0.2%</td><td>13/09/2013</td></tr>
</table>
Phase 3:
<table>
<tr><th>Meter</th><th>Type and serial number</th><th>Accuracy class</th><th>Calibrations</th></tr>
<tr><td>Main meter</td><td>Schneider ION 8600 (MT-1108A590-01)</td><td>0.2%</td><td>13/09/2013</td></tr>
<tr><td>Back-up meter</td><td>Schneider ION 8600 (MT-1011A454-01)</td><td>0.2%</td><td>13/09/2013</td></tr>
</table></td></tr>
</table>

Calculation method (if applicable):	CFE is responsible for meter measurement (hourly recording) and provide generation data to the project participant by means of monthly reports. Data provided by CFE monthly reports will be cross checked with CFE bills in order to check data reliability. Crosscheck of parameter 1 (net energy received by CFE from PA) is done by considering the generation data measured by the main meter located at the sub-station and the sum of all electricity delivered to the clients + the excess of electricity from each month (banked by CFE). Crosscheck of parameter 2 (net energy delivered by CFE to PA) is done by considering the consumption data of the PA measured by the main meter located at the sub-station and the measurement of the electricity delivered by CFE to the PA.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions
Additional comment:	Data are kept archived during the crediting period and until two years later. In the cases of failure of the main meter, CFE will use the back-up meter measurement. In case that both meters would not work correctly, net generation supplied to the grid will be estimated by CFE in a conservative and reliable way.

Ex-post grid emission factor:

According to ACM0002 v.02, the ex-post simple OM and ex-post BM emission factors are calculated using data for the year in which project generation occurs. Generation for this project occurred from September 2011 to May 2014, hence OM and BM are calculated for 2011 (see EF calculation spreadsheet). No calculations have been done for 2011 onwards due to the absence reliable data released by SENER.

Data / Parameter: 2	**EF_y**
Unit:	tCO_2/MWh
Description:	Baseline emission factor calculated as the weighted average of the Operating Margin and the Building Margin emission factors in year y
Measured/ Calculated / Default:	Calculated
Source of data:	ACM0002 methodology “Consolidated methodology for grid-connected electricity generation from renewable sources”, version 02.
Value(s) of monitored parameter:	2011: 0.544 tCO_2/MWh
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	Calculated as the weighted average of the OM and the BM.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 3	**$EF_{OM,y}$**
Unit:	tCO_2/MWh

Description:	Operating Margin Emission Factor for Mexican grid in year y
Measured/ Calculated / Default:	Calculated
Source of data:	ACM0002 methodology "Consolidated methodology for grid-connected electricity generation from renewable sources", version 02.
Value(s) of monitored parameter:	2011: 0.679 tCO_2/MWh
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	Equation provided by ACM0002 v.02.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (CM ex-post emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 4	**$EF_{BM,y}$**
Unit:	tCO_2/MWh
Description:	Build Margin Emission Factor for Mexican grid in year y
Measured/ Calculated / Default:	Calculated
Source of data:	ACM0002 methodology "Consolidated methodology for grid-connected electricity generation from renewable sources", version 02.
Value(s) of monitored parameter:	2011: 0.408 tCO_2/MWh
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	Equation provided by ACM0002 v.02.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post CM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 5	**$F_{i,y}$**
Unit:	TJ
Description:	Amount of each fossil fuel consumed by each power plant in year y
Measured/ Calculated / Default:	Measured (provided by official sources)
Source of data:	*Balance Nacional de Energía 2011*, graph 52, page 127 (www.energia.gob.mx/res/PE_y_DT/pub/2012/BNE_2011.pdf) Official national data published by SENER (Energy Secretariat of the Mexican Government)

Value(s) of monitored parameter:	<table><tr><th></th><th>2011 Fuel consumption ($F_{i,y}$) [TJ]</th></tr><tr><td>Fuel oil</td><td>420,920</td></tr><tr><td>Natural Gas</td><td>1,203,090</td></tr><tr><td>Natural Gas Liquids</td><td>2,710</td></tr><tr><td>Diesel</td><td>20,090</td></tr><tr><td>Coal</td><td>303,020</td></tr><tr><td>Petroleum Coke</td><td>31,770</td></tr></table>
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	As in other registered PDD (for example Eurus Wind Farm) the total fuel consumption for generation is divided into the different types of power plants, in order to determine the weighted average of the actual CO_2 emissions in Mexico.
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor).
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 6	**$COEF_i$**
Unit:	tCO_2/TJ
Description:	CO_2 emission coefficient of each fuel type *i*
Measured/ Calculated / Default:	Calculated/default
Source of data:	2006 IPCC Guidelines on National GHG Inventories, Volume 2, Chapter 1, table 1.4 (lower limit of the uncertainty at 95% confidence interval)
Value(s) of monitored parameter:	<table><tr><th></th><th>$COEF_i$ (tCO_2/TJ)</th></tr><tr><td>Fuel oil</td><td>75.5</td></tr><tr><td>Natural Gas</td><td>54.3</td></tr><tr><td>Natural Gas Liquids</td><td>58.3</td></tr><tr><td>Diesel</td><td>72.6</td></tr><tr><td>Coal</td><td>87.3</td></tr><tr><td>Petroleum Coke</td><td>82.9</td></tr></table>
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	The CO_2 emission coefficient is obtained as: $COEF_i = NCV_i \cdot EF_{CO2,i} \cdot OXID_i$ As local values or country-specific values are not available, IPCC default values are used. As the amount of fuel is already provided in TJ, the emission factor provided by IPCC does not need to be multiplied by NCV_i. Also, default emission factors provided by IPCC already include the oxidation factor ($OXID_i$). Hence, $COEF_i = EF_{CO2,i}$.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor and ex-post BM emission factor)

Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 7	**$GEN_{i,y}$**
Unit:	MWh/year
Description:	Electricity generation of each power source in year y In OM calculation: j refers to the power sources delivering electricity to the grid, not including low cost/must run power plants/units and including imports to the grid. In BM calculation: j refers to the power plants capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently.
Measured/ Calculated / Default:	Measured/Calculated (provided by official sources)
Source of data:	SENER, "Prospectiva del Sector Eléctrico 2012-2026" (table 23, page 113) (http://www.aiest.unam.mx/biblio/PSE_2012_2026.pdf)
Value(s) of monitored parameter:	For $GEN_{i,y}$ (used for OM calculations): 2011: Electricity delivered to the grid ($GEN_{i,y}$) excluding low cost/must run and including imports (GWh): 188,290 For $GEN_{i,y}$ (used for BM calculations): see Table 8 and 9.
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	In OM calculation: yearly electricity generation is only provided by SENER per type of power plants, hence calculation is carried out with available data (see excel calculation spreadsheet).
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor and ex-post BM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 8	**Plant name**
Unit:	Text
Description:	Identification of power source for the OM
Measured/ Calculated / Default:	Estimated
Source of data:	SENER "Prospectiva del Sector Eléctrico 2012-2026" (table 23, page 113) (http://www.aiest.unam.mx/biblio/PSE_2012_2026.pdf)
Value(s) of monitored parameter:	See Table 6 below.
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly

Calculation method (if applicable):	As fuel consumption is not provided for each power plant, calculations are carried out in relation to types of power plants. Hence plant names are not needed; plants have been put into groups per type of fuel used.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 9	**Plant name**
Unit:	Text
Description:	Identification of power source for the BM
Measured/ Calculated / Default:	Estimated
Source of data:	SENER "Prospectiva del Sector Eléctrico 2010-2025" (graph 12, page 90 and table 5, page 195) and "Prospectiva del Sector Eléctrico 2012-2026" (table 61, page 196, 197).
Value(s) of monitored parameter:	See Table 8 and Table below.
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post BM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 10	**$F_{j,y}$**
Unit:	TJ
Description:	Amount of fuel consumption for the new installed plants in year y
Measured/ Calculated / Default:	Calculated (provided by official sources)
Source of data:	For 2011 data: • Installed capacity and type of fuel: "Prospectiva del Sector Eléctrico 2012-2026" (table 61, page 196, 197). • Self-use rate (%):"Prospectiva del Sector Eléctrico 2012-2026" (table 63, page 203), "Usos propios" for CC, GT, CAR, IC and NUC. Average value for power plant types. • Efficiency (%):"Prospectiva del Sector Eléctrico 2012-2026" (table 63, page 203), "Eficiencia bruta". Average value for power plant types.
Value(s) of monitored parameter:	2011

Tecnology	Self-use (%)	Efficiency (%)
CC	2.17%	51.03%
GT	1.37%	35.16%
CAR	7.20%	37.87%
IC	6.79%	41.93%
NUC	3.50%	34.92%

Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	As yearly fuel consumption by power plant is not provided by official sources, this parameter is calculated through power plants installed capacity, self-consumption rate and efficiency, as per next equation: Fuel consumption (TJ) = 3.6 TJ/GWh_{therm} * [Annual Generation (GWh_e) / E (GWh_e/GWh_{therm})] (see excel calculation spreadsheet).
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post BM emission factor).
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 11	**New capacity additions**
Unit:	Text
Description:	New capacity additions in the electric sector
Measured/ Calculated / Default:	Measured
Source of data:	SENER "Prospectiva del Sector Eléctrico 2010-2025" (graph 12, page 90 and table 5, page 195) and "Prospectiva del Sector Eléctrico 2012-2026" (table 61, page 196, 197).
Value(s) of monitored parameter:	See Table 8 and Table below.
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	**-**
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post BM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 12	**GEN_{imp}**
Unit:	MWh
Description:	Electricity imports to the project electricity system
Measured/ Calculated / Default:	Calculated
Source of data:	SENER, "Prospectiva del Sector Eléctrico 2012-2026" (table 23, page 113).
Value(s) of monitored parameter:	**2011** Imports (GWh) 596
Monitoring equipment:	
Measuring/ Reading/ Recording frequency:	Yearly

Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

Data / Parameter: 13	**$COEF_{imp}$**
Unit:	tCO_2/MWh
Description:	CO_2 emission coefficient of fuels used in connected electricity systems.
Measured/ Calculated / Default:	Default
Source of data:	As per established by ACM0002 v.02: "*For imports from connected electricity system located in another country, the emission factor is 0 tCO_2/MWh*"
Value(s) of monitored parameter:	0
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions (ex-post OM emission factor)
Additional comment:	Electronic archived data kept during the crediting period and two years later

D.3. Implementation of sampling plan

>> N/A

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

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

>> The baseline scenario represents the electricity that would have otherwise been generated by the operation of the grid-connected power plants and by the addition of new generation sources.

According to the methodology ACM0002 (version 02), the baseline emissions are to be calculated as follows:

$$BE_y = EG_y \cdot EF_y$$

Where:

BE_y = Baseline emissions (tCO_2/yr)
EG_y = Electricity supplied to the grid by the project (MWh)
EF_y = CO_2 emission factor for grid (tCO_2/MWh)

Next is shown the methodology used for baseline emissions calculations:

1) Calculation of EF_y

Operating margin (OM) emission factor

ACM0002 v.02 methodology provides four methods to calculate the operating margin. For the Bii Nee Stipa Project, option (a) "Simple OM" has been chosen because:

i) sufficient data is not available for using the Dispatch Data Analysis option, and

ii) low-cost/must-run resources in Mexico have represented less than 50% of total grid generation over the 5 most recent years as it is shown in Table 5:

%	2007	2008	2009	2010	2011	Average 5 most recent years
Renewable + Hydro + Nuclear	19.4%	23.7%	18.7%	20.4%	20.3%	20.5%
Others	80.6%	76.3%	81.3%	79.6%	79.7%	79.5%

Table 5. Percentage of electricity generation by energy source. Source: SENER "Prospectiva del Sector Eléctrico 2012-2026" (table 23, page 113)[1].

As shown in the Table , the average share of low-cost/must run generation (e.g.; hydro, geo/wind and nuclear plants) for the last five years has been 21%, significantly below 50%.

As it was pointed in the project PDD, the Simple OM emission factor is calculated ex-post for each year in which the project generation displaces grid electricity. The Operating Margin calculation is based on yearly statistics provided by SENER (Mexican Energy Secretariat).

The Simple OM Emission Factor ($EF_{OM,simple,y}$) is calculated as the generation-weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants.

$$EF_{OM,simple,y} = \frac{\sum_{i,j} F_{i,j,y} \cdot COEF_{i,j}}{\sum_{j} GEN_{j,y}} \quad (1)$$

where

$F_{i,j,y}$ is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in year(s) y,

j refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports[5] to the grid,

$COEF_{i,j,y}$ is the CO_2 emission coefficient of fuel i (tCO_2 / mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y, and

$GEN_{j,y}$ is the electricity (MWh) delivered to the grid by source j.

[1] http://www.sener.gob.mx/res/PE_y_DT/pub/2012/PSE_2012_2026.pdf

The CO_2 emission coefficient $COEF_i$ is obtained as

$$COEF_i = NCV_i \cdot EF_{CO2,i} \cdot OXID_i \quad (2)$$

where:
NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i,
$OXID_i$ is the oxidation factor of the fuel (see page 1.29 in the 1996 Revised IPCC Guidelines for default values),
$EF_{CO2,i}$ is the CO_2 emission factor per unit of energy of the fuel i.
Where available, local values of NCV_i and $EF_{CO2,i}$ should be used. If no such values are available, country-specific values (see e.g. IPCC Good Practice Guidance) are preferable to IPCC world-wide default values.

In the CO_2 emission coefficient $COEF_i$ calculation, NCV_i and $OXID_i$ are not needed as the amount of fossil fuel is already provided by SENER in terajoules (TJ) and emission factor EF_{CO2} provided by IPCC default values already includes oxidation factor. Hence, the obtained amount of fuel can be directly multiplied by the emission factor EF_{CO2} provided by IPCC.

On another hand, fuel consumption data provided by SENER are aggregated by type of fuel. The amount of fuel consumed by each plant is not publicly available and hence, amount of fuel consumed per type of fuel is used for calculations.

Hence, formula applied is:

$$EF_{OM,y} = \frac{\sum_{i,j} F_{i,y} \cdot EF_{CO2,i}}{GEN_y}$$

Emissions by type of fuel in the year 2011 are:

	2011		
	Fuel consumption ($F_{i,y}$) [TJ]	CO2 emission coefficient ($COEF_i$) [tCO2/TJ]	CO2 emissions [tCO2]
Fuel oil	420,920	75.5	31,779,460
Natural Gas	1,203,090	54.3	65,327,787
Natural Gas Liquids	2,710	58.3	157,993
Diesel	20,090	72.6	1,458,534
Coal	303,020	87.3	26,453,646
Petroleum Coke	31,770	82.9	2,633,733
Total	-	-	**127,811,153**
EF_{OM} (tCO2/MWh)	**0.679**		

Table 6. Operating margin emission factor 2011. Source: Balance Nacional de Energía 2011, graph 52, page 127[2] for fuel consumption and 2006 IPCC Guidelines on National GHG Inventories, Volume 2, Chapter 1, Table 1.4 for fuel emission factors.

Where electricity delivered to the grid (GEN_y) is:

[2] Balance Nacional de Energía 2011: http://www.energia.gob.mx/res/PE_y_DT/pub/2012/BNE_2011.pdf

	2011
Electricity delivered to the grid ($GEN_{i,y}$) excluding low cost/must run and including imports (GWh)	188,290

Table 7. Electricity delivered to the grid 2011. Source: SENER, "Prospectiva del Sector Eléctrico 2012-2026" (table 23, page 113)[3].

As per ACM0002 v.02 methodology, imports from connected electricity systems located in other countries are included in OM calculations taking into account an emission factor of 0tCO_2/MWh. Also, exports are not subtracted from electricity generation data. (Please see EF calculation spreadsheet).

Build margin (BM) emission factor

The building Margin emission factor is calculated as the generation-weighted average emission factor (tCO_2/MWh) of a sample of power plants m.

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \cdot COEF_{i,m}}{\sum_{m} GEN_{m,y}}$$

where $F_{i,m,y}$, $COEF_{i,m}$ and $GEN_{m,y}$ are analogous to the variables described for the simple OM method above for plants *m*.

As per ACM0002 v.02 methodology, option 2 is chosen: "*for the first crediting period, the Build Margin emission factor $EF_{BM,y}$ must be updated annually ex post for the year in which actual project generation and associated emissions reductions occur*" (this is to say 2011).

The sample group *m* consists of either:

- the five power plants that have been built most recently, or
- the power plants capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Project participants should use from these two options that sample group that comprises the larger annual generation.

a) Generation of the five power plants that have been built most recently (excluding CDM project activities) for 2011

2011							
Power plants characteristics					Gross generation (GWh)	Self-use rate (%)	Net generation (GWh)
Name of the power plant	Start of operation	Technology *	Fuel	Installed capacity (MW)			
Yuumil iik	01/07/2011	EOL	-	1.5	0	0.0%	0
Petacalco	21/03/2010	CAR	Coal	678.4	3,760	7.2%	3,489
Norte Durango	01/01/2010	CC	Natural Gas	450	3,787	2.2%	3,705
San Lorenzo Potencia	30/12/2009	CC	Natural Gas	116	890	2.2%	871
San Lorenzo Potencia	30/12/2009	CC	Natural Gas	133	1,021	2.2%	999
Annual electricity generation (5 units) (GWh)							**9,064**

Table 8. Generation of the five power plants that have been built most recently (excluding CDM project activities) for 2011. Source: see Table 11.

CAR= Coal power
EOL= Wind power
CC= Combined cycle

[3] Prospectiva del Sector Eléctrico 2012-2026: http://www.aiest.unam.mx/biblio/PSE_2012_2026.pdf

b) Generation of the power plants capacity additions that comprise 20% of the system generation and that have been built more recently (excluding CDM project activities) for 2011

2011	Power plants characteristics					Gross generation (GWh)	Self-use rate (%)	Net generation (GWh)	Accumulated net generation (GWh)	Accumulated net generation over total SIN 2010 net generation (%)
	Name of the power plant	Start of operation	Technology *	Fuel	Installed capacity (MW)					
Additions 2011	Yuumil iik	01/07/2011	EOL	-	1.5	0	0.0%	0	0	0.00%
Additions 2010	Aragón (Ext. LyFC)	07/08/2010	GT	Natural Gas	32	0	0.0%	0	0	0.00%
	Petacalco	21/03/2010	CAR	Coal	678.4	3,760	7.2%	3,489	3,489	1.48%
	Norte Durango	01/01/2010	CC	Natural Gas	450	3,787	2.2%	3,705	7,194	3.06%
Additions 2009	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	116	890	2.2%	871	8,065	3.43%
	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	133	1,021	2.2%	999	9,064	3.85%
	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	133	1,021	2.2%	999	10,062	4.28%
	Coapa	24/09/2009	GT	Natural Gas	32	0	0.0%	0	10,062	4.28%
	Santa Cruz	24/09/2009	GT	Natural Gas	32	0	0.0%	0	10,062	4.28%
	Magdalena	24/09/2009	GT	Natural Gas	32	0	0.0%	0	10,062	4.28%
	Iztapalapa	20/08/2009	GT	Natural Gas	32	0	0.0%	0	10,062	4.28%
	Presidente Juárez	15/07/2009	CC	Natural Gas	185					
	Presidente Juárez	12/07/2009	CC	Natural Gas	92					
Additions 2008	Humeros	07/04/2008	GEO	-	40.00	336	0.0%	336	10,398	4.42%
	Ciudad del Carmen	01/05/2008	GT	Diesel	16.00	0	0.0%	0	10,398	4.42%
	Ciudad del Carmen	01/05/2008	GT	Diesel	17.00	0	0.0%	0	10,398	4.42%
Additions 2007	Santa Rosalía	01/10/2007	IC	Diesel	1.60					
	Santa Rosalía	01/10/2007	IC	Diesel	1.60					
	Santa Rosalía	01/10/2007	IC	Diesel	1.60					
	Vallejo (LFC)	09/08/2007	GT	Natural Gas	32.00	0	0.0%	0	10,398	4.42%
	Holbox	01/07/2007	IC	Diesel	0.80	0	0.0%	0	10,398	4.42%
	Holbox	01/07/2007	IC	Diesel	0.80	0	0.0%	0	10,398	4.42%
	Tamazunchale (PIE)	21/06/2007	CC	Natural Gas	1,135.00	8,434	2.2%	8,251	18,650	7.92%
	Baja California Sur I	11/06/2007	IC	Diesel	41.90					
	El Cajón (Leonardo	01/06/2007	HY	-	750.00	604	0.0%	604	19,254	8.18%
	Coyotepec (LFC)	30/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Coyotepec (LFC)	30/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Cuautitlán (LFC)	30/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	La Venta II	05/01/2007	EOL	-	83.30					
	Villa de las Flores	04/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Victoria (LFC)	04/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Remedios (LFC)	04/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Ecatepec (LFC)	04/01/2007	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
Additions 2006	Atenco (LFC)	2006	GT	Natural Gas	32.00	0	0.0%	0	19,254	8.18%
	Chihuahua II (El	2006	CC	Natural Gas	619.00	4,816	2.2%	4,712	23,965	10.18%
	Los Cabos	2006	GT	Natural Gas	27.20					
	Altamira V (PIE)	2006	CC	Natural Gas	1,121.00	8,385	2.2%	8,203	32,169	13.67%
	Tuxpan V (PIE)	2006	CC	Natural Gas	495.00	3,993	2.2%	3,906	36,075	15.33%
	Valladolid III (PIE)	2006	CC	Natural Gas	525.00	2,503	2.2%	2,449	38,524	16.37%
Additions 2005	Hermosillo	2005	CC	Natural Gas	227.00	1,397	2.2%	1,367	39,891	16.95%
	Ixtaczoquitlan	2005	HY	-	1.60	0	0.0%	0	39,891	16.95%
	Yecora	2005	IC	Diesel	0.70	0	0.0%	0	39,891	16.95%
	Baja California Sur I	2005	IC	Diesel	42.90					
	Botello	2005	HY	-	9.00	0	0.0%	0	39,891	16.95%
	Rio Bravo IV PIE	2005	CC	Natural Gas	500.00	3,514	2.2%	3,438	43,328	18.41%
	La Laguna II PIE	2005	CC	Natural Gas	498.00	3,671	2.2%	3,591	46,920	19.93%
	Holbox	2005	IC	Diesel	0.80	0	0.0%	0	46,920	19.93%
Additions 2004	Guerrero Negro II	2004	IC	Diesel	10.80					
	El Sauz	2004	CC	Natural Gas	128.00	590	2.2%	577	47,497	20.18%
	Annual electricity generation (20%) (GWh)							**47,497.40**		

Table 9. Generation of the power plants capacity additions that comprise 20% of the system generation and that have been built more recently (excluding CDM project activities) for 2011. Source: see Table 11.

GT= Gas turbine
GEO= Geothermal power
IC= Diesel combustion power
HY= Hydro power

Annual generation for 2011 is large for sample group of power plants capacity additions that comprise 20% of the system generation than for the five power plants that have been built most recently. Hence, BM calculation equation will be applied to power plants installed in Mexico that comprise the yearly last 20% system generation:

$$EF_{BM,y} = \frac{\sum_{i,j} F_{i,j,y} \cdot EF_{CO2,i}}{\sum_{j} GEN_{j,y(20\%)}}$$

As mentioned before, fuel consumption is not available for each power plant, it will be estimated through the power plants generation, self-use rate and efficiency, as per next equation:

Fuel consumption (TJ) = 3.6 TJ/GWh_{therm} * [Net generation (GWh_e) / Efficiency (GWh_e/GWh_{therm})]

Where net generation is calculated by subtracting the self-use percentage to the gross generation.

BM calculations for year 2011 are presented next:

2011	Power plants characteristics				Gross generation (GWh)	Self-use rate (%)	Net generation (GWh)	($\eta_{m,y}$) Efficiency (%)	Fuel consumption (TJ)	$EF_{CO2,i}$ [tCO_2/ TJ]	Emissions [tCO_2]
	Name of the power plant	Start of operation	Technology *	Fuel							
Additions 2011	Yuumil iik	01/07/2011	EOL	-	0	0.0%	0		0	0.0	0
Additions 2010	Aragón (Ext. LyFC)	07/08/2010	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Petacalco	21/03/2010	CAR	Coal	3,760	7.2%	3,489	37.9%	33,166	87.3	2,895,424
	Norte Durango	01/01/2010	CC	Natural Gas	3,787	2.2%	3,705	51.0%	26,136	54.3	1,419,195
Additions 2009	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	890	2.2%	871	51.0%	6,145	54.3	333,661
	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	1,021	2.2%	999	51.0%	7,045	54.3	382,560
	San Lorenzo Potencia	30/12/2009	CC	Natural Gas	1,021	2.2%	999	51.0%	7,045	54.3	382,560
	Coapa	24/09/2009	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Santa Cruz	24/09/2009	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Magdalena	24/09/2009	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Iztapalapa	20/08/2009	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Presidente Juárez	15/07/2009	CC	Natural Gas							
	Presidente Juárez	12/07/2009	CC	Natural Gas							
Additions 2008	Humeros	07/04/2008	GEO	-	336	0.0%	336		0	0.0	0
	Ciudad del Carmen	01/05/2008	GT	Diesel	0	0.0%	0	35.2%	0	72.6	0
	Ciudad del Carmen	01/05/2008	GT	Diesel	0	0.0%	0	35.2%	0	72.6	0
Additions 2007	Santa Rosalía	01/10/2007	IC	Diesel							
	Santa Rosalía	01/10/2007	IC	Diesel							
	Santa Rosalía	01/10/2007	IC	Diesel							
	Vallejo (LFC)	09/08/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Holbox	01/07/2007	IC	Diesel	0	0.0%	0	41.9%	0	72.6	0
	Holbox	01/07/2007	IC	Diesel	0	0.0%	0	41.9%	0	72.6	0
	Tamazunchale (PIE)	21/06/2007	CC	Natural Gas	8,434	2.2%	8,251	51.0%	58,208	54.3	3,160,680
	Baja California Sur I	11/06/2007	IC	Diesel							
	El Cajón (Leonardo	01/06/2007	HY	-	604	0.0%	604		0	0.0	0
	Coyotepec (LFC)	30/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Coyotepec (LFC)	30/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Cuautitlán (LFC)	30/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	La Venta II	05/01/2007	EOL	-							
	Villa de las Flores	04/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Victoria (LFC)	04/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Remedios (LFC)	04/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Ecatepec (LFC)	04/01/2007	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
Additions 2006	Atenco (LFC)	2006	GT	Natural Gas	0	0.0%	0	35.2%	0	54.3	0
	Chihuahua II (El	2006	CC	Natural Gas	4,816	2.2%	4,712	51.0%	33,238	54.3	1,804,818
	Los Cabos	2006	GT	Natural Gas							
	Altamira V (PIE)	2006	CC	Natural Gas	8,385	2.2%	8,203	51.0%	57,870	54.3	3,142,317
	Tuxpan V (PIE)	2006	CC	Natural Gas	3,993	2.2%	3,906	51.0%	27,558	54.3	1,496,395
	Valladolid III (PIE)	2006	CC	Natural Gas	2,503	2.2%	2,449	51.0%	17,275	54.3	938,011
Additions 2005	Hermosillo	2005	CC	Natural Gas	1,397	2.2%	1,367	51.0%	9,641	54.3	523,532
	Ixtaczoquitlan	2005	HY	-	0	0.0%	0		0	0.0	0
	Yecora	2005	IC	Diesel	0	0.0%	0	41.9%	0	72.6	0
	Baja California Sur I	2005	IC	Diesel							
	Botello	2005	HY	-	0	0.0%	0		0	0.0	0
	Rio Bravo IV PIE	2005	CC	Natural Gas	3,514	2.2%	3,438	51.0%	24,252	54.3	1,316,887
	La Laguna II PIE	2005	CC	Natural Gas	3,671	2.2%	3,591	51.0%	25,336	54.3	1,375,724
	Holbox	2005	IC	Diesel	0	0.0%	0	41.9%	0	72.6	0
Additions 2004	Guerrero Negro II	2004	IC	Diesel							
	El Sauz	2004	CC	Natural Gas	590	2.2%	577	51.0%	4,074	54.3	221,206
	Annual electricity generation (20%) (GWh)						**47,497.40**				**19,392,969**
	EF_{BM} (tCO2/GWh)	**0.408**									

Table10. BM calculation 2011. Source: see Table 11.

Sources of data used for BM calculations for year 2011 are presented next:

BM input data	Sources of input data for 2011
Name of the power plant	"Prospectiva del Sector Eléctrico 2012-2026" (table 61, page 196, 197).
Technology	
Installed capacity (MW)	
Fuel	
Gross generation (GWh)	
Start of operation	"Prospectiva del Sector Eléctrico 2012-2026" (table 6, page 65). "Prospectiva del Sector Eléctrico 2010-2025" (graph 12, page 90). "Prospectiva del sector eléctrico 2010-2025" (table 17, page 103), "Prospectiva del sector eléctrico 2009-2024" (table 18, page 96), "Prospectiva del sector eléctrico 2008-2017" (table 19, page 101), "Prospectiva del sector eléctrico 2007-2016" (table 19, page 77), "Prospectiva del sector eléctrico 2006-2015" (table 13, page 57), "Prospectiva del sector eléctrico 2005- 2014" (table 14, page 51)
Self-use rate (%)	"Prospectiva del Sector Eléctrico 2012-2026" (table 63, page 203), "Usos propios" for CC, GT, CAR, IC and NUC. Average value for power plant types
Efficiency (%)	"Prospectiva del Sector Eléctrico 2012-2026" (table 63, page 203), "Eficiencia bruta". Average value for power plant types

Table 11. Sources of data used for 2011 BM calculations.

Plants included in Baja California and Baja California Sur isolated grids, as well as CDM project activities, have been excluded (see cells with grey shading in the BM calculation tables).

Baseline emission factor (EF_y):

The calculation of the baseline emission factor (EF_y) is calculated as the weighted average of the OM and the BM as per:

$$EF_y = EF_{OM,y} \times w_{OM} + EF_{BM,y} \times w_{BM}$$

Where:

$EF_{BM,y}$ = Build Margin CO_2 emission factor in year y (t CO_2/MWh)

$EF_{OM,y}$ = Operating Margin CO_2 emission factor in year y (t CO_2/MWh)

w_{OM} = Weight of Operating Margin emissions factor (%)

w_{BM} = Weight of Build Margin emissions factor (%)

According to ACM0002 v.02, default values of 50% should be chosen ($w_{OM} = w_{BM} = 0.5$). Final grid emission factors are obtained:

$$EF_{CM,2011} = 0.679 \times 0.5 + 0.408 \times 0.5 = 0.544 tCO2 / MWh$$

1) Quantity of net electricity generation fed into the grid by the project in the monitoring period

The electricity exported to the grid by the project during the monitoring period was measured by CFE electricity main meter located at the CFE sub-station and provided to the project participant through monthly reports.

The parameter EGy is calculated from two sub-parameters included in the monthly CFE reports "Conciliación Mensual".

1- "ENERGÍA NETA RECIBIDA DE Bii Nee Stipa EN EL PI" (net energy received by CFE from Project Activity) and

2- "ENERGÍA NETA ENTREGADA A Bii Nee Stipa EN EL PI" (net energy delivered by CFE to Project Activity).

EGy = 1 – 2

Monitored data are shown next:

Month	Net Energy Exported to the Grid (MWh)
Sep-11	4367
Oct-11	7733
Nov-11	9567
Dec-11	13177
Jan-12	10857
Feb-12	10488
Mar-12	9014
Apr-12	5232
May-12	5080
Jun-12	1520
Jul-12	38998
Aug-12	14006
Sep-12	23285
Oct-12	36516
Nov-12	48820
Dec-12	31373
Jan-13	59187
Feb-13	46979
Mar-13	64849
Apr-13	34426
May-13	32828
Jun-13	23363
Jul-13	44904
Aug-13	49505
Sep-13	6068
Oct-13	38156
Nov-13	71498
Dec-13	69213
Jan-14	75204
Feb-14	56362
Mar-14	48806
Apr-14	46961
May-14	48662
Total	**1,087,003**

Table 12. Electricity exported to the grid by the project.

The total electricity exported to the grid by the project during the monitoring period is of 1,087,003 MWh.

1) Emissions reductions from the project activity

The total baseline emissions of the project from September 1st 2011 to May 30st 2014 are calculated as per the following formula:

$$BE_y(tCO_2) = EF_y(CO_2 / MWh) \cdot EG_y(MWh)$$

In the table below, the monthly and total baseline emissions are calculated and shown:

Crediting period Months	Net energy exported to the grid (MWh)	Emission Factor ex-post (tCO2/MWh)	Baseline Emissions (tCO2)
Sep-11	4367	0.544	2,373
Oct-11	7733	0.544	4,203
Nov-11	9567	0.544	5,199
Dec-11	13177	0.544	7,162
Jan-12	10857	0.544	5,901
Feb-12	10488	0.544	5,700
Mar-12	9014	0.544	4,899
Apr-12	5232	0.544	2,843
May-12	5080	0.544	2,761
Jun-12	1520	0.544	826
Jul-12	38998	0.544	21,196

Aug-12	14006	0.544	7,613
Sep-12	23285	0.544	12,656
Oct-12	36516	0.544	19,848
Nov-12	48820	0.544	26,535
Dec-12	31373	0.544	17,052
Jan-13	59187	0.544	32,170
Feb-13	46979	0.544	25,535
Mar-13	64849	0.544	35,248
Apr-13	34426	0.544	18,711
May-13	32828	0.544	17,843
Jun-13	23363	0.544	12,698
Jul-13	44904	0.544	24,407
Aug-13	49505	0.544	26,908
Sep-13	6068	0.544	3,298
Oct-13	38156	0.544	20,739
Nov-13	71498	0.544	38,862
Dec-13	69213	0.544	37,620
Jan-14	75204	0.544	40,876
Feb-14	56362	0.544	30,635
Mar-14	48806	0.544	26,528
Apr-14	46961	0.544	25,525
May-14	48662	0.544	26,450
Total	**1,087,003**	0.544	**590,820**

Table 13. Baseline emissions of the project.

As it can be seen, the total baseline emissions achieved by the project activity are 590,820 tCO2.

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

>> According to the methodology ACM0002, the project emissions are 0 tons of CO2.

E.3. Calculation of leakage

>> According to the methodology ACM0002, the leakage is 0 tons of CO2.

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_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	590,820	0	0	590,820

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
Emission reductions or GHG removals by sinks (t CO_2e)	569,882[4]	2011: 18,937 tCO2 2012: 127,830 tCO2 2013: 294,039 tCO2 2014: 150,014 tCO2

[4] The value obtained in the ex-ante calculation of the revised CDM-PDD corresponds to the emissions released from September 1st 2011 to May 30st 2014. That is to say: 4 months generation in 2011, 12 months

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

>> Actual emission reductions during the monitoring period have been 3.7% higher than estimated in ex-ante calculation of registered PDD. This is due to a higher production of electricity plus a higher emission factor that previously calculated. Either way this is a usual deviation taking into account that wind power generation depends on the level of wind.

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 CO_2e)	146,767	444,053

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in 2012-13 and 5 months in 2014 multiplied by the estimated correspondent emission factors (see next foot page):

Emission reductions in 2011:
- (26.35 MW * 3,960 h/year) * 4/12 months * 0.4925 tCO_2/MWh = 17,130 tCO_2

Emission reductions in 2012:
- (26.35 MW * 3,960 h/year + 74 MW *3,831 h/year * 6/12 months) * 0.4859 tCO_2/MWh = 119,577 tCO_2

Emission reductions in 2013:
- (26.35 MW * 3,960 h/year + 74 MW *3,831 h/year + 70 MW * 3,612 h/year) * 0.4792 tCO_2/MWh = 307,014 tCO_2

Emission reductions in 2014:
- (26.35 MW * 3,960 h/year + 74 MW *3,831 h/year + 70 MW * 3,612 h/year) * 5/12 months * 0.4726 tCO_2/MWh = 126,161 tCO_2

Total emission reductions for the crediting period: 17,130 + 119,577 + 307,014 + 126,161 = **569,882 tCO_2**

Appendix 1. 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
Organization name	GAMESA ENERGIA S.A.
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Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for completing the CDM-MR-FORM
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Direct tel.	
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Document information

Version	*Date*	*Description*
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

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