



**Monitoring report form
(Version 05.1)**

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

MONITORING REPORT

Title of the project activity	Los Santos Wind Power Project	
UNFCCC reference number of the project activity	6275	
Version number of the monitoring report	3.2	
Completion date of the monitoring report	08/09/2016	
Monitoring period number and duration of this monitoring period	02 (01/07/2014 – 30/04/2016 – both days included)	
Project participant(s)	Cooperativa de Electrificación Rural Los Santos (COOPESANTOS) Carbonbay GmbH & Co. KG	
Host Party	Costa Rica	
Sectoral scope(s)	01	
Selected methodology(ies)	AMS-I.D.ver. 17- Grid connected renewable electricity generation.	
Selected standardized baseline(s)	Not Applicable	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	27,413	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	Not applicable	27,193

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project consists of fifteen 850kW GAMESA wind power turbines installed in Cooperativa de Electrificación Rural Los Santos' (COOPESANTOS) concession area in El Guarco and Desamparados, Costa Rica. The project requires a total investment of approximately US\$ 38 million for an installed capacity of 12.75 MW.

The technology applied is: The project activity utilizes 15 horizontal axis GAMESA G52-850 WTGs with a rated capacity of 850 kW each. Table A.1. shows the detail specifications of the turbines. The turbine lifetime according to the detailed datasheets for the GAMESA G52-850 is of 20 years.

During this monitoring period turbine #5 had its generator replaced by GAMESA due to a problem with the original one. Also, the original back up meter installed was replaced by another one that can be calibrated, in order to meet governmental standards regarding calibration of meters. This meter was also replaced by later by another model of the same make due to technical issues that were identified.

The project feasibility study calculated a plant load factor of 42.68% and the turbine supply contract guarantees a minimum of 42 GWh per year.

To most relevant dates in the development of the project are: The WTG Purchase contract is dated on 05/05/2010. The construction contract was signed on 27/05/2010. The initial ERPA was signed on 16/06/2010.

The installed WTGs were handed over to COOPESANTOS on 30/09/2011. The final inauguration of the project activity was performed on 11/11/2011.

The first monitoring period of the project activity was from 01/07/2012 until 30/06/2014 and generated 27,444 CERs (UNFCCC Ref. No. 6275.).

The proposed project has generated and supplied 76,475 Mwh net to the grid during the presented monitoring period. The GHG emission reductions achieved in this monitoring period, from 01/07/2014 to 30/04/2016, are 27,193 tCO₂.

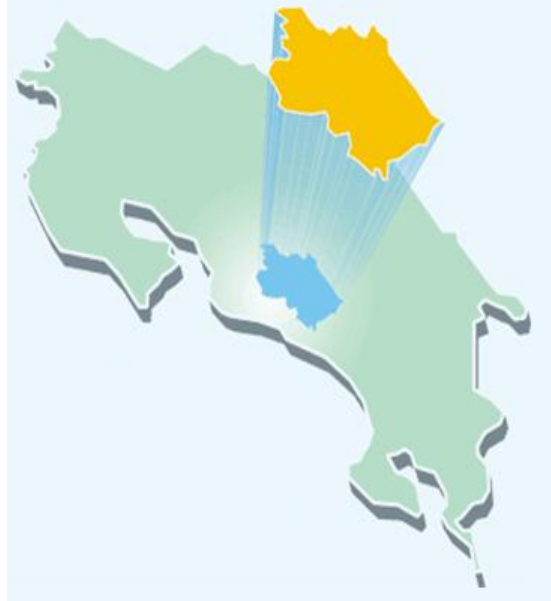
A.2. Location of project activity

The project is located in the Cooperativa de Electrificación Rural Los Santos (COOPESANTOS) concession; specifically near the villages of La Paz y Casamata in Costa Rica, Central America.

Figure 1: Overall location of the Project Activity



Figure 2: Precise location of the Project Activity



The coordinates of each of the turbines are:

Los Santos WPP WTG location per WGS-84 in Decimal Degrees		
WTG	Point X	Point Y
1	-83.988589825	9.7897531113
2	-83.98860966	9.7883634826
3	-83.989456506	9.7873123643
4	-83.994728062	9.7804501239
5	-83.995051061	9.77956023
6	-83.995144276	9.7785940543
7	-83.995391708	9.7778119651
8	-83.995728875	9.7770686646
9	-83.989123902	9.7765678523
10	-83.988797486	9.7756851295
11	-83.978657513	9.7599926323
12	-83.979018405	9.759236338

13	-83.978944143	9.7552176092
14	-83.977049062	9.7540770716
15	-83.977161488	9.7532034666

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Costa Rica (Host Party)	Cooperativa de Electrificación Rural Los Santos (COOPESANTOS) (Private Entity)	No
Germany	Carbonbay GmbH & Co. KG.	No

A.4. Reference of applied methodology and standardized baseline

The project applies following methodology:

AMS-I.D – Grid connected renewable electricity generation (version 17).
<https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

The project is a small scale project activity and falls under the category I.D as per the Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities.

The applicable tools are:

- “Tool to calculate the emission factor for an electricity system” – Version 02.2.1.

A.5. Crediting period of project activity

Renewable crediting period, starting on 01/07/2012, 7 years twice renewable

A.6. Contact information of responsible persons/entities

The overall responsibility for the preparation of the Monitoring Report is under:

Christian Giles

Anaconda Carbon S.A.

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www.anacondacarbon.com

Tel: +504 2550 0387

Anaconda Carbon S.A. is not a project participant.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The project is completely installed and was under operation during the monitoring period.

The technical specifications of the installed equipment are as follows:

Parameter	Specification
Operating Data	
Rated power	850 kW
Cut-in wind speed	4 m/s
Rated wind speed	13 m/s
Cut-off wind speed	25 m/s
Rotor	
Type	3 Blades, Upwind / Horizontal axis
Diameter	52 m
Rotational speed at rated power	14.6 to 30.8 rpm
Swept area	2,124 m ²
Gearbox	
Type	1 planetary stage / 2 helical stages
Ratio	1: 74.5
Nominal Load	850 kW
Generator	
Type	Double feed generator
Speed at rated power	1.320:2.340 rpm
Rated power	850 kW
Rated voltage	690 V AC (phase to phase)
Frequency	60 Hz

There were no relevant downtimes during the presented monitoring period. All downtimes are recorded at the site and for each turbine and the electricity meters worked properly during the presented monitoring period.

Below is a table with the downtimes that have resulted in the stoppage of a turbine:

Date	Duration	Description
29/07/2014	10 days	Mechanical failure due to prematurely worn parts.
17/11/2014	6 ½ days	Mechanical failure due to worn parts.
11/03/2015	11 ½ days	Mechanical failure due to worn parts.
01/08/2015	½ day	Mechanical failure due to worn parts.
18/08/2015	1 ½ days	Mechanical failure due to worn parts.
13/11/2015	14 ½ days	Generator replacement and alignment.
07/03/2016	2 ½ days	Mechanical failure due to worn parts.
25/04/2016	1 ½ days	Mechanical failure due to worn parts.

B.2. Post registration changes

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

No deviation was observed for the project activity during the monitoring period.

B.2.2. Corrections

Not applicable

B.2.3. Changes to start date of crediting period

No change to the start date of the crediting period has been requested.

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

Not applicable

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

The monitoring plan has not been revised

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

No changes apply for the project activity.

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

Not applicable

SECTION C. Description of monitoring system**Management Structure and Responsibilities**

Overall responsibility for daily monitoring and reporting lies with the project owner. The manager of the proposed project is responsible for review the monthly reported results/data and checks the calibration certificates.

Data Collection: The electricity supplied by the project activity to the grid is measured by calibrated electricity meters 0.2 class. The parameter is monitored at the control room with a Supervisory Control and Data Acquisition (SCADA) system and crosschecked with review of the receipts of electricity sales to Cooperativa de Electrificación Rural Los Santos (COOPESANTOS) co-operative members and invoices of electricity purchase from the grid company ICE.

It shall be mentioned that a discrepancy between the records on delivered electricity to the grid and the invoices to the ICE can occur due to the following reason:

The Los Santos Wind Park has been build based on the national law 8345 "Participation of Rural Electrification Cooperatives in the National Development". As per Article 9, the national grid can buy the surplus of generated electricity which is not consumed by the members of the cooperative, but is not force to do so. Therefore, not all generated electricity which is delivered to the grid is also paid by ICE, generating for some months a discrepancy between the metered electricity and the invoices.

Data is measured continuously and recorded at least hourly as required by the applicable methodology.

Data Recording: All data collected is recorded monthly into an electronic spreadsheet.

Data Calibration: All measurements are conducted with calibrated measurement equipment according to relevant industry or national standards. As per the country regulations (RRG-2440-2001), the electricity meters shall be tested or calibrated every 5 years (see section 9.1).

Data Report: Data recorded and the receipts will be consolidated on a monthly basis and will be checked for quality control purposes with official reports or statistics. If there are discrepancies in the data, the source of the variation will be identified. The data report will be concluded monthly and will be verified by the Project Developer's Head Office.

Data Archives: The data recording, the data report and the invoices are archived, together with this monitoring plan. All data collected as part of monitoring are archived electronically and be kept at least for 2 years after the end of the last crediting period or the last issuance of CERs, whichever is later.

Data Quality Control: An internal procedure to secure the correctness of data is regularly carried out. Data and reports are checked internally to secure correctness of data. In case of mistakes, the source of the variation will be identified, whether it is the main measured value or the control value. The data report is concluded monthly and verified by the Project Developer's Head Office. Corrective actions will be applied to avoid future similar mistakes wherever appropriate.

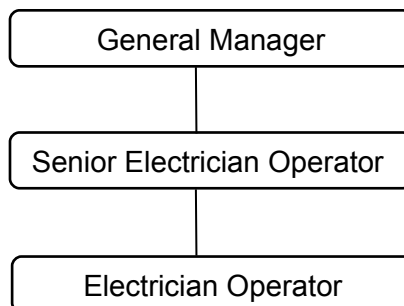
Training and Monitoring Personnel: All people that participate in the monitoring process are suitably qualified and trained in the operation and maintenance of the plant. They will also receive instructions of the monitoring plan.

Emission factor calculation: The combined margin emission factor is fixed for the first crediting period, using ex-ante data for OM and BM as described in section B.6.3. of the registered PDD.

Verification and Monitoring Results: The monitoring report is prepared by the monitoring personnel and/or the designed consulting company, in this case Anaconda Carbon S.A. It contains the data report, the emission factor calculation and the results of the emissions reductions of the project for a certain period.

Leakage monitoring: No energy generating equipment is transferred from another activity to this project and there is no existing equipment to be transferred to another activity. The project activity involves electricity generation from wind. The employed wind energy generator can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus, in no ways and means are required to monitor leakage from the project activity. The project owner can adjust and modify the monitoring plan accordingly in order to meet operational requirements. These changes need to be approved by the verifier during the periodic verifications.

The relevant company personnel involved in the monitoring activities are:



The responsibilities of each function are as follows:

General Manager

1. Signs off on the written statement for each month.
2. Designates the representative for precision testing and calibration.
3. Attaches seals to the meters or designates the appropriate person for this function.

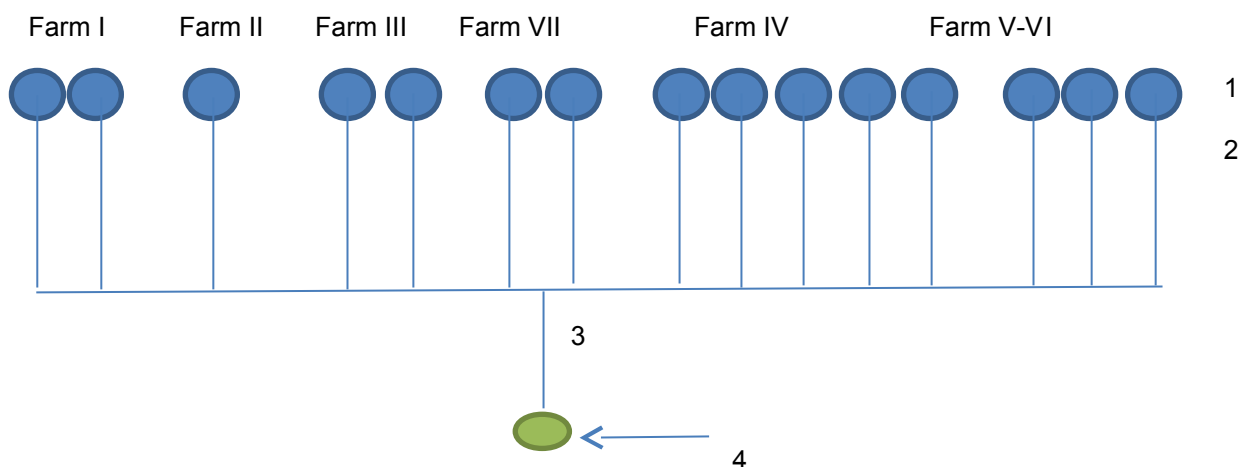
Senior Electrician Operator

1. Drafts the written statement for each month to be delivered to the General Manager for signature.
2. Verifies the readings carried out by the Electrician Operator.
3. Maintains communication with the energy buyer.

Electrician Operator

1. Carries out readings from meters.
2. Stores readings in electronic database.
3. Sends meter readings to Senior Electrician Operator for the monthly written statement.

Metering diagram for the project Los Santos:



- 1: Generator 1-15
- 2: Underground three phase line
- 3: Air three phase circuit
- 4: “La Lucha” substation with ION main and backup meters.

SECTION D. Data and parameters

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

Data/parameter:	EF_{grid,CM,y}
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the electricity system in year y
Source of data	Calculated
Value(s) applied)	0.35559
Choice of data or measurement methods and procedures	Calculated as per “Tool to calculate the emission factor for an electricity System

Purpose of data	To calculate baseline emissions.
Additional comments	Calculated as weighted sum of the OM and BM emission factors, as explained in section B.6.3. of the registered PDD. This data will be archived electronically and according to internal procedures, until 2 years after the end of the crediting period.

Data/parameter:	EF_{grid,BM,y}
Unit	tCO2/MWh
Description	Build margin CO2 emission factor for the project electricity system in the year y
Source of data	Calculated
Value(s) applied)	0.0612
Choice of data or measurement methods and procedures	This data will be archived electronically and according to internal procedures, until 2 years after the end of the crediting period.
Purpose of data	To calculate baseline emissions.
Additional comments	Calculated as explained in section B.6.3 of the registered PDD

Data/parameter:	EF_{grid,OM,y}
Unit	tCO2/MWh
Description	Operating margin CO2 emission factor for the project electricity system in year y
Source of data	Calculated
Value(s) applied)	0.4537
Choice of data or measurement methods and procedures	This data will be archived electronically and according to internal procedures, until 2 years after the end of the crediting period.
Purpose of data	To calculate baseline emissions.
Additional comments	Calculated as explained in section B.6.3 of the registered PDD

Data/parameter:	FC_{i,m,y}
Unit	Mass or volume unit
Description	Amount of fossil fuel type i consumed by power plant / unit m
Source of data	Data provided by ICE (Instituto Costarricense de Electricidad), state own company.
Value(s) applied)	See EF Calculation
Choice of data or measurement methods and procedures	Simple adjusted OM: For each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option); BM: For the first crediting period, ex ante option is chosen, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period
Purpose of data	To calculate baseline emissions
Additional comments	None

Data/parameter:	NCV_{i,y}
Unit	GJ/mass or volume unit
Description	Net calorific value (energy content) of fossil fuel type i in year y

Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied)	See EF Calculation
Choice of data or measurement methods and procedures	Simple adjusted OM: For each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option); BM: For the first crediting period, ex ante option is chosen, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period
Purpose of data	To calculate baseline emissions
Additional comments	None

Data/parameter:	EF_{CO₂,j,y}
Unit	tCO ₂ /GJ
Description	CO ₂ emission factor of fossil fuel type i used in power unit m in year y
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied)	See EF calculation
Choice of data or measurement methods and procedures	Simple adjusted OM: For each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option); BM: For the first crediting period, ex ante option is chosen, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period
Purpose of data	To calculate baseline emissions
Additional comments	None

Data/parameter:	EG_{m,y}
Unit	MWh
Description	Net electricity generated by power plant/unit m in year y
Source of data	Data provided by ICE (Instituto Costarricense de Electricidad), state own company.
Value(s) applied)	See EF Calculation
Choice of data or measurement methods and procedures	Simple adjusted OM: For each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option); BM: For the first crediting period, ex ante option is chosen, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period
Purpose of data	To calculate baseline emissions
Additional comments	Calculated as weighted sum of the OM and BM emission factors, as explained in section B.6.3 of the registered PDD

D.2. Data and parameters monitored

Data/Parameter	EG_{facility,y}					
Unit	MWh					
Description	Net quantity of electricity produced by the wind farm and supplied to the Grid.					
Measured/calculated/default	Measured.					
Source of data	Electricity meter.					
Value(s) of monitored parameter	76,475 Mwh					
Monitoring equipment	Description	Model	Serial #	Dates	Last Calibrated	Calibration validity
	Main Meter	Schneider Electric ION 7650	PJ-1103A527-02	Project Start Date – Current date	29/09/2014	5 years
	Back up meter (Old)	Nexus 1252	412-99939	Project Start Date – 29/06/2015	Initial calibration	Meter cannot be calibrated
	Back up meter (Old)	Schneider Electric ION 7650	PJ-1103A523-02	29/06/2015 - 06/06/2016	12/05/2015	5 years
	Back up meter (Present)	Schneider Electric ION 7650	MJ1501A45 605	06/06/2016 – Current date	11/05/2015	5 years
Measuring/Reading/ Recording frequency	Continuously monitored and at least monthly recording.					
Calculation method (if applicable)	Net electricity is defined as the electricity produced minus the imported electricity.					
QA/QC procedures	<p>As per the country regulations (RRG-2440-2001), the electricity meters shall be tested or calibrated every 5 years (see section 9.1). To guarantee QC/QA, it will be double checked by receipts for electricity sales.</p> <p>The planification department of the Cooperative reads data from the tabular reports of the main and back up meters and makes a consolidated report on a monthly basis, which is then utilized to make invoices for electricity sold.</p>					
Purpose of data	Calculation of emission reductions.					
Additional comment	<p>The net electricity is defined as the electricity produced minus the imported electricity. In this case, the meters show automatically the net electricity generated, as they are bidirectional.</p> <p>This data will be archived electronically and according to internal procedures, until 2 years after the end of the crediting period.</p>					

D.3. Implementation of sampling plan

Not applicable

SECTION E. Calculation of emission reductions or GHG removals by sinks**E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

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

Where:

BE_y = Baseline emissions in year y (tCO₂)

$EG_{\text{facility},y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (Mwh)

$EF_{\text{grid,CM},y}$ = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the “Tool to calculate the emission factor for an electricity system” (tCO2/MWh)

$$BE_y = 76,475.00 \text{ MWh} * 0.35559 \text{ tCO}_2/\text{MWh}$$

$$BE_y = 27,193 \text{ tCO}_2$$

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

No project emissions apply for the project activity as per the applied methodology. No relevant emission source applies for the project activity that has not been reported.

E.3. Calculation of leakage

No leakage is accounted as per the applied methodology. Summary of calculation of emission reductions or net GHG removals by sinks.

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

Item	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	27,193	0	0	0	27,193	27,193

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

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO ₂ e)	27,413	27,193

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

The achieved emission reductions are lower than the expectations of the PDD, therefore, no further assessment is required.

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

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Cooperativa de Electrificación Rural Los Santos (COOPESANTOS)
Street/P.O. Box	
Building	
City	San Marcos de Tarrazu
State/region	
Postcode	
Country	Costa Rica
Telephone	+506 2546-2525
Fax	+506 2546-6173
E-mail	info@coopesantos.com
Website	www.coopesantos.com
Contact person	
Title	General Manager
Salutation	Mr.
Last name	Calderon
Middle name	
First name	Elías
Department	
Mobile	+506 8391-2375
Direct fax	
Direct tel.	+506 2546-2525
Personal e-mail	info@coopesantos.com

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Carbonbay GmbH & Co. KG.
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City	Hamburg
State/region	
Postcode	20459
Country	Germany
Telephone	
Fax	
E-mail	
Website	http://www.mabanaft.com
Contact person	
Title	Mr.
Salutation	
Last name	Huenteler
Middle name	

First name	Henning
Department	
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Direct fax	+49 40 37004 829
Direct tel.	+49 40 37004 846
Personal e-mail	henning.huenteler@carbonbay.com

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Anaconda Carbon S.A.
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E-mail	info@anacondacarbon.com
Website	www.anacondacarbon.com
Contact person	Mr. Christian Giles
Title	President
Salutation	Mr.
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Middle name	Drummond
First name	Christian
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