



**Monitoring report form for CDM programme of activities
(version 01.0)**

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

MONITORING REPORT

Title of the programme of activities (PoA)	Green Power for South Africa	
UNFCCC reference number of the PoA	7167	
Version number(s) of the PoA-DD(s) applicable to this monitoring report	Version 10	
Coordinating/managing entity (CME)	Additional Energy Limited	
Version number of this monitoring report	03	
Completion date of this monitoring report	22/06/2016	
Monitoring period number and dates covered by this monitoring report	Monitoring Period Number: 01 Dates Covered: 01/06/2013 to 30/06/2015	
Monitoring report number for this monitoring period	02	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a specific-case CPA covered in this monitoring report?(yes/no)
	Republic of South Africa	Yes
Sectoral scope(s)	1:Energy industries (renewable / non-renewable sources)	
Selected methodology(ies)	ACM0002 ver. 12.3.0- Consolidated baseline methodology for grid-connected electricity generation from renewable sources	
Selected standardized baseline(s)	N/A	
Total amount of GHG emission reductions or net GHG removals by sinks for all specific-case CPAs in the PoA covered in this monitoring report	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
	N/A	257,077

PART I - Programme of activities

SECTION A. Description of PoA

A.1. Brief description of the PoA

The Green Power for South Africa Programme of Activities ("PoA") consists of a series of projects consisting of wind and solar power, implemented by participating organisations.

Additional Energy Limited is the Coordinating/Managing Entity ("CME") of the PoA, and has provided an open platform for different technology and service suppliers to participate in the PoA by developing their own CPAs. The emission reductions in this programme therefore arise from the substitution of grid electricity, which mainly comes from centralised coal-fired power stations, with the utilisation of solar and wind energy. The renewable energy plants will provide electricity into the national grid system.

The PoA is designed in such a way that individual, national and international project developers and financiers are able to join the programme to improve the financial viability of the projects with the introduction of carbon revenues. Each CPAs are technology specific, i.e. either solar power or wind power, and will be developed as separate facilities. Additional Energy Limited as the coordinating entity will ensure that all participating organisations/ subcontractors and technologies meet the specified standards of the programme, thereby ensuring that the quality of both the systems and the installations are not compromised

The stated goals of the PoA are to supply, install and finance wind and solar CPAs to provide renewable energy into the South African grid and reduce greenhouse gas ("GHG") emissions through the avoidance of electricity generated by the combustion of fossil fuel

A.1.1. Generic CPA(s)

Title, identification/reference number and/or version number of the generic CPA(s) of the PoA	Sectoral scope(s)	Applied methodology(ies) or combination of methodologies and/or standardized baseline(s)
CPA[XXX], Version 10 Title of the generic CPA is described as CPA [XXX] in the PoA-DD (Version 10).	1:Energy industries (renewable / non-renewable sources)	ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.3.0) Tool to calculate the emission factor for an electricity system (Version 02.2.1) Combined tool to identify the baseline scenario and demonstrate additionality (Version 04.0.0) Tool for the demonstration and assessment of additionality (Version 06.1.0) Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion (Version 02)

A.1.2. Specific-case CPA(s) covered in this monitoring report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Title, identification/reference number and version number of the generic CPA to which the specific-case CPA applies	Crediting period dates of the specific-case CPA	Is this specific-case CPA covered in this monitoring report? (yes/no)
7167-0001:Scatec Solar Linde CPA-001 ("SSL CPA-001")	CPA[XXX], Version 10	01/07/2014 - 30/06/2024	No
7167-0002:Scatec Solar Kalkbult CPA-002 ("SSK CPA-002")	CPA[XXX], Version 10	01/06/2013 - 31/05/2023	Yes
7167-0003:AE-AMD Herbert CPA-003 ("AEH CPA-003")	CPA[XXX], Version 10	09/12/2013 - 08/12/2023	No
7167-0004:Erika Energy Soutpan CPA-004 ("EES CPA-004")	CPA[XXX], Version 10	09/12/2013 - 08/12/2023	No

CPA-004")			
7167-0005:Core Energy Witkop CPA-005 ("CEW CPA-005")	CPA[XXX], Version 10	10/03/2014 - 09/03/2024	No
7167-0006:Solar Capital De Aar 1 CPA-006 ("SCDA1 CPA-006")	CPA[XXX], Version 10	0/03/2014 – 29/02/2024	No
7167-0007:Solar Capital De Aar 3 CPA-007 ("SCDA3 CPA-007")	CPA[XXX], Version 10	01/01/2015 - 31/12/2024	No
7167-0008:Lesedi 74.96 MW Solar PV Project CPA-008	CPA[XXX], Version 10	01/01/2014 - 31/12/2023	No
7167-0009:Letsatsi 74.96 MW Solar PV Project CPA-009	CPA[XXX], Version 10	01/01/2014 - 31/12/2023	No
7167-0010:Scatec Solar Dreunberg CPA-010	CPA[XXX], Version 10	01/07/2014 - 30/06/2024	No
7167-0011:Boshof Solar Park CPA-011	CPA[XXX], Version 10	01/12/2014 - 30/11/2024	No

A.2. Contact information of the coordinating/managing entity (CME) and/or responsible persons(s)/entity(ies)

Anil Bhatta
Additional Energy Limited
anil@additionalenergy.com

Additional Energy Limited Plc is the CME of the PoA.

SECTION B. Implementation of PoA

B.1. Implementation of the management system of the PoA

As the CME for this PoA, Additional energy Limited is responsible for managing the CDM cycle and coordinating the issuance of CERs.

Record keeping system for each CPA and systems/procedures to avoid double counting

All CPAs under the Green Power for South Africa Programme will be technology specific (i.e. either solar or wind power) and will be fixed or non-transferable, commercial plants that can be easily identified with GPS coordinates, which will prevent incidences of double counting. In addition, Additional Energy has a recordkeeping system which maintains data relating to each CPA such as project developer details, site addresses, GPS Coordinates which are compared against the record of projects under the CDM undergoing validation or those that are registered to further avoid double counting.

The management of this system is relatively simple considering the nature of the programme activities which will limit each CPA to a small number of installations. Operation and management of the various projects is at the CPA level and each CPAs are provided with the monitoring manual

that provides guidelines on monitoring requirements, roles and responsibilities of the CME and the CPA implementer.

In line with the paragraph 19 of the CDM Project Standard (ver. 03.0, EB74, 26 Jul 2013), Additional Energy has developed a “CME Management System” that is made available to the Designated Operational Entity (DOE). The “CME management system” provides the processes and tools necessary to ensure compliance of the PoA and CPAs with the CDM Project Standard (ver. 03.0).

B.2. Implementation of single sampling plan(s)

The CPA is monitored individually. Therefore, sampling plan is not required for the CPA.

SECTION C. Post-registration changes to the PoA (including the generic CPA(s))

C.1. Corrections

N/A

C.2. Inclusion of a monitoring plan to the registered PoA-DD (including its generic CPA-DD(s)), if a monitoring plan was not included at the time of registration

N/A

C.3. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

N/A

C.4. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

N/A

C.5. Types of changes specific to afforestation and reforestation activities

N/A

PART II - Specific-case component project activity(ies)

SECTION D. Description of specific-case CPA(s)

D.1. Brief description of implemented specific-case CPA(s)

SSK CPA-002 comprise of 75 MWp (Kalkbult) solar PV plant located between Potfontein and De Aar in the Northern Cape Province of South Africa. The PV design incorporates a single axis tracking system. Description of technical parameters of Solar PV plant is provided in Table A.2 below.

Table A.2: Description of Technical Parameters of CPA 002 Solar PV Plant

Parameter	Value	Unit
Technology	-	Solar PV
Installed Capacity	75	MWp
Average Yield	1,935	kWh/kWp
System Uptime	98.5	%
Grid Downtime	5	%
Net Average Yield	1,811	kWh/kWp
Capacity Factor	20.67	%

Parameter	PV Modules	Inverters
Manufacturer	BYD	SMA
Model	BYD 240P6C-30	SMA SC 800CP XT
Individual power in KW	240Wp	800 kW
Number of equipment installed	312,504	84

The construction of the plant was commenced from 02/11/2012 and the plant started feeding electricity into the grid from 01/09/2013. In this monitoring period, the CPA reduced 257,077 tCO_{2e}. The CME has a recordkeeping system which has maintained data relating to each CPA such as project developer details, GPS Coordinates of the project site that has avoided double counting.

D.2. Geographical references or other means of identification of the location of the specific-case CPA(s)

CPA	Host Party(ies)	Location/Province	City/Town/Municipality	Geographical Location(GPS Coordinates)
CPA 7167-0002	Republic of South Africa	Northern Cape Province	Between Potfontein and De Aar Town	S 30°09' 34" E 24°07' 50"

SECTION E. Post-registration changes to specific-case CPA(s)

E.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

N/A

E.2. Corrections

N/A

E.3. Changes to the start date of the crediting period of the specific-case CPA(s)

N/A

E.4. Inclusion of a monitoring plan into the specific-case CPA(s) that was not included at registration

N/A

E.5. Permanent changes to the monitoring plan as described in the registered specific-case CPA-DD(s), applied methodology or standardized baseline

N/A

E.6. Changes to project design of the specific-case CPA(s)

N/A

E.7. Types of changes specific to afforestation and reforestation specific-case CPA(s)

N/A

SECTION F. Description of the monitoring system of specific-case CPA(s)

The following parameters were monitored for CPA 7167-0002.

$EG_{facility, y}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y .

$EG_{imported, y}$: Quantity of electricity imported into the power plant/used by the power plant and supplied by the grid in year y .

The diagram below depicts the monitoring system showing the monitoring point of CPA 7167-0002. Import and export electricity for the CPA are measured by the electricity meters located at the grid substation near the project site, which is shown as "Meter" in the diagram below.

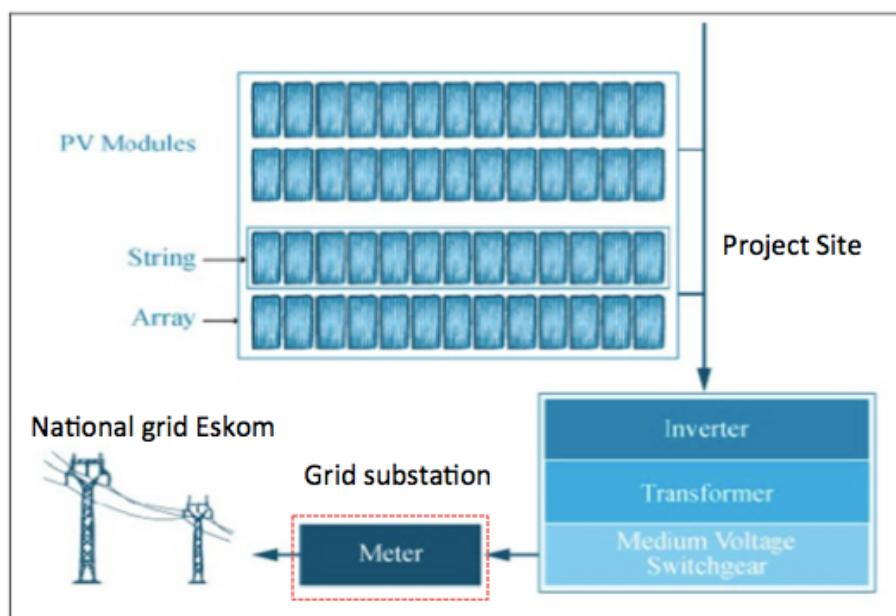


Figure 1. Monitoring system showing the monitoring point of the CPA 7167-0002

The following flow chart depicts the roles and responsibility of CPA Developer and the CME in terms of data monitoring.

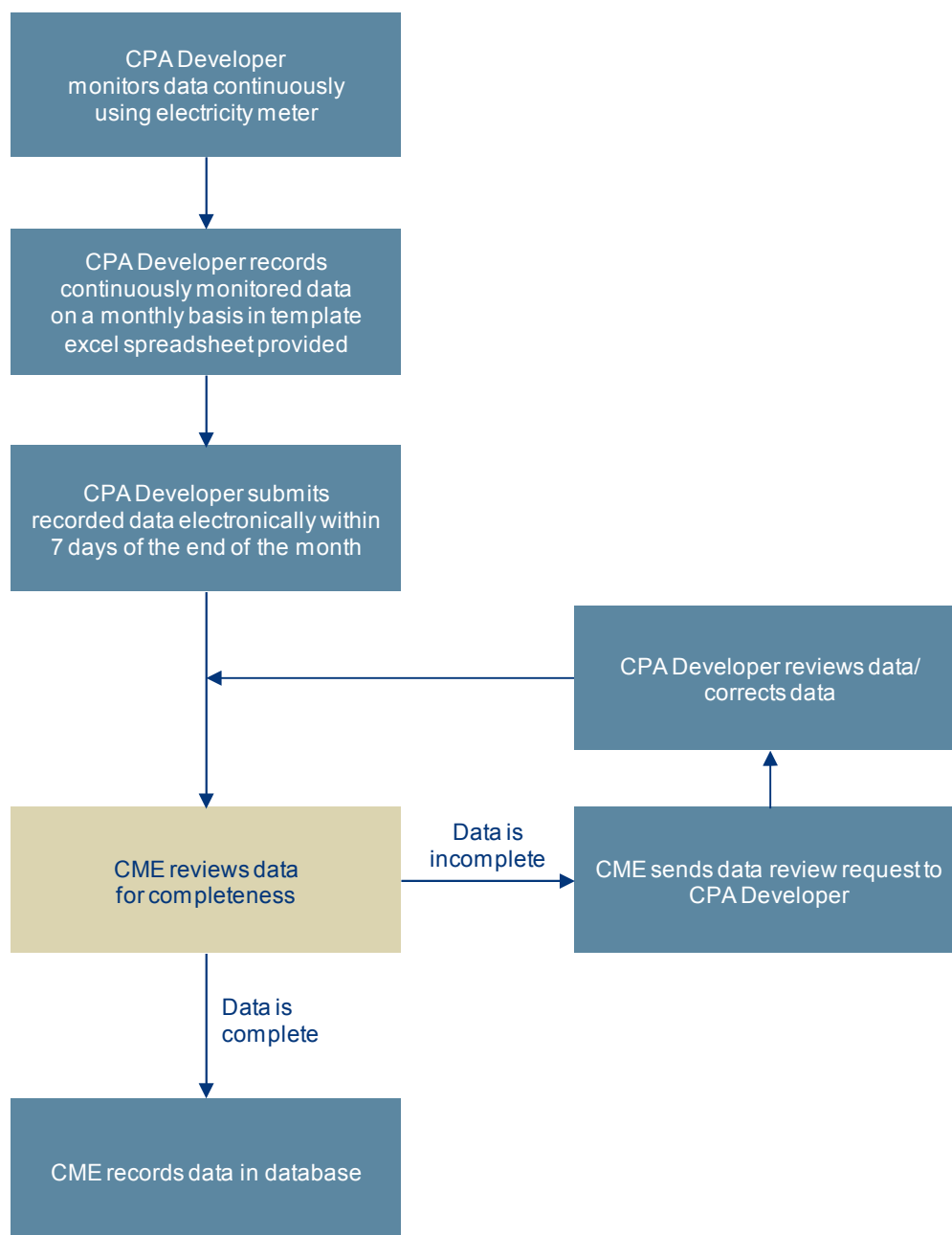


Figure 2. Monitoring Roles and Responsibility and Data Flow

In terms of data flow, the CPA implementer sends the project data to the CME who reviews and records the data in the CME database. If CME finds any issues or have any questions in the data, it goes back to the respective CPA implementer for clarification or correction. The CME has utilized the monitored data for calculating emissions reductions and preparing monitoring reports for the CPAs.

The CME has provided trainings to CPA implementers on data monitoring and recording methods that is in compliance with CDM requirements. The CPA implementer was trained on CDM and project monitoring requirements on 6 August 2014.

As part of QA/QC process, the CME has developed a manual called “Monitoring Guideliness for CPA Developers” that outlines information on project data to be collected, data to be reported and managed. Furthermore, the CME has developed a data template for the CPA implementes to record and report project data to the CME. Both these two documents were provided to the CPA implementer. The CME would cross-check project data provided by the CPA implementer. If any inconsistency in data were found, the CME would go back to the CPA implementer and ask for clarification or request for the correct data. The CME has utilised its internal QA/QC guidelines to cross-check the reported data. The CPA is monitored individually. Therefore, sampling plan is not required for the CPA.

SECTION G. Data and parameters

G.1. Data and parameters fixed ex ante, at registration, inclusion or renewal of crediting period

Data/parameter	$EF_{grid,CM,y}$
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the project electricity system applicable to the wind and solar power generation
Source of data	Grid emission factor calculated in the registered PoA-DD
Value(s) applied	0.9721
Choice of data or measurement methods and procedures	Grid emission factor calculated in the registered PoA-DD
Purpose of data	Calculation of Baseline Emissions
Additional comments	N/A

G.2. Data and parameters monitored

Data/parameter	$EG_{facility,y}$
Unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y.
Measured/calculated/ default	Measured
Source of data	Direct, physical measurements as recorded by metering equipment (electricity meter) at project site
Value(s) of monitored parameter	264,456

Monitoring equipment	Electricity data are monitored by the bi-directional electricity meter installed at the TRF-1 and TRF-2 lines, respectively. Information on electricity meter is as follows:		
	TRF-1 line		
	Description	Main Meter	Check Meter
	Manufacturer	Elster	Elster
	Type	A1700	A1700
	Serial Number	3514811200069	3514811200093
	Accuracy Class	0.2S	0.2S
	Calibration Frequency	5 years	5 years
	Date of last calibration	15/01/2014	15/01/2014
	Validity of meters	14/01/2019	14/01/2019
	TRF-2 line		
	Description	Main Meter	Check Meter
	Manufacturer	Elster	Elster
	Type	A1700	A1700
	Serial Number	3514811200077	3514811200085
	Accuracy Class	0.2S	0.2S
Calibration Frequency	5 years	5 years	
Date of last calibration	15/01/2014	15/01/2014	
Validity of meters	14/01/2019	14/01/2019	
Measuring/reading/recording frequency	Continuous measurement and at least monthly recording.		
Calculation method (if applicable)	$EG_{facility, y}$ = Total electricity exported to the grid – $EG_{imported, y}$		
QA/QC procedures	Monitored data is cross-checked with sales/purchase invoices. The electricity meter is periodically calibrated according to the national standard NRS 057: 2009.		
Purpose of data	Calculation of baseline emissions		
Additional comments	--		

Data/parameter	$EG_{imported, y}$
Unit	MWh/y
Description	Quantity of electricity imported into the power plant/used by the power plant and supplied by the grid in year y.
Measured/calculated/ default	Measured
Source of data	Direct, physical measurements as recorded by metering equipment (electricity meter) at project site
Value(s) of monitored parameter	999

Monitoring equipment	<p>Electricity data are monitored by the bi-directional electricity meter installed at the TRF-1 and TRF-2 lines, respectively. Information on electricity meter is as follows:</p> <p>TRF-1 line</p> <table border="1"> <tr> <th>Description</th><th>Main Meter</th><th>Check Meter</th></tr> <tr> <td>Manufacturer</td><td>Elster</td><td>Elster</td></tr> <tr> <td>Type</td><td>A1700</td><td>A1700</td></tr> <tr> <td>Serial Number</td><td>3514811200069</td><td>3514811200093</td></tr> <tr> <td>Accuracy Class</td><td>0.2S</td><td>0.2S</td></tr> <tr> <td>Calibration Frequency</td><td>5 years</td><td>5 years</td></tr> <tr> <td>Date of last calibration</td><td>15/01/2014</td><td>15/01/2014</td></tr> <tr> <td>Validity of meters</td><td>14/01/2019</td><td>14/01/2019</td></tr> </table> <p>TRF-2 line</p> <table border="1"> <tr> <th>Description</th><th>Main Meter</th><th>Check Meter</th></tr> <tr> <td>Manufacturer</td><td>Elster</td><td>Elster</td></tr> <tr> <td>Type</td><td>A1700</td><td>A1700</td></tr> <tr> <td>Serial Number</td><td>3514811200077</td><td>3514811200085</td></tr> <tr> <td>Accuracy Class</td><td>0.2S</td><td>0.2S</td></tr> <tr> <td>Calibration Frequency</td><td>5 years</td><td>5 years</td></tr> <tr> <td>Date of last calibration</td><td>15/01/2014</td><td>15/01/2014</td></tr> <tr> <td>Validity of meters</td><td>14/01/2019</td><td>14/01/2019</td></tr> </table>	Description	Main Meter	Check Meter	Manufacturer	Elster	Elster	Type	A1700	A1700	Serial Number	3514811200069	3514811200093	Accuracy Class	0.2S	0.2S	Calibration Frequency	5 years	5 years	Date of last calibration	15/01/2014	15/01/2014	Validity of meters	14/01/2019	14/01/2019	Description	Main Meter	Check Meter	Manufacturer	Elster	Elster	Type	A1700	A1700	Serial Number	3514811200077	3514811200085	Accuracy Class	0.2S	0.2S	Calibration Frequency	5 years	5 years	Date of last calibration	15/01/2014	15/01/2014	Validity of meters	14/01/2019	14/01/2019
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Purpose of data	Calculation of baseline emissions																																																
Additional comments	--																																																

G.3. Implementation of specific-case CPA level sampling plan

The CPA is individually monitored and no sampling plan was implemented.

SECTION H. Calculation of GHG emission reductions or net GHG removals by sinks

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

The baseline emissions (BE_y) are calculated using **equation (6)** of ACM0002 ver.12.3.0 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Where:

BE_y = Baseline Emissions in year y (tCO_2)

$EG_{PJ,y}$ = 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)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y (tCO_2/MWh)

If CPA is a greenfield renewable energy power plant, $EG_{PJ,y}$ for the CPA is expressed as follows;

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

Therefore, the baseline emissions are calculated by the following equation:

$$\begin{aligned} BE_y &= EG_{facility,y} * EF_{grid,CM,y} \\ &= 264,456 \text{ MWh} * 0.9721 tCO_2/MWh \\ &= 257,077 tCO_2 \end{aligned}$$

Summary of Baseline Emissions):

<i>Period</i>	<i>BE_y (tCO₂)</i>
01/09/2013-30/06/2015	257,077

Detailed calculation has been provided to the DOE in a separate spreadsheet.

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

CPA 7167-0002 generates electricity through solar PV technology. For solar PV power generation, project emissions $PE_y = 0$ as per ACM0002.

H.3. Calculation of leakage

There are no relevant leakage emissions associated with all CPAs covered in this monitoring period. Therefore, leakage is not considered.

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

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	GHG emission reductions or net GHG removals by sinks (tCO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
7167-0002	257,077	0	0	0	257,077	257,077
Total	257,077	0	0	0	257,077	257,077

H.5. Comparison of GHG emission reductions or net GHG removals by sinks with estimates in the included CPA-DD(s)

Specific-case CPA reference number	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
7167-0002	239,797 (01/09/2013 - 30/06/2015)	257,077 (01/09/2013 - 30/06/2015)
Total	239,797	257,077

Note: The values estimated in *ex ante* calculation is based on the annual GHG emission reductions for each year in the CPA-DDs during this monitoring period.

H.6. Remarks on difference from the estimated value in the included CPA-DD(s)

The actual emission reductions for the 1st monitoring period is higher by 7.21 % as compared to estimated GHG emission reductions for the monitoring period.

The main reason for higher than estimated emission reduction is due to higher Performance Ratio achieved by the plant during the monitoring period. The plant's performance ratio was estimated to be 81.79%, however, in actual the plant achieved performance ratio of 83.73%. The higher performance ratio achieved during the monitoring period resulted in higher electricity production and hence higher emission reduction.

Furthermore, the plant availability was estimated to be 98.5%, however, in actual higher plant availability of 98.89% was achieved. Similarly, budgeted grid availability for the 1st monitoring period was estimated to be 95%, however, in actual higher grid availability of 99.99% was achieved. These factors ultimately resulted in higher net electricity production and hence higher emission reductions.

Appendix 1. Contact information of coordinating/managing entity and/or responsible persons/entities

Coordinating/managing entity and/or responsible person/entity	<input checked="" type="checkbox"/> Coordinating/managing entity <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Additional Energy Limited
Street/P.O. Box	34B York Way
Building	
City	London
State/Region	
Postcode	N1 9AB
Country	United Kingdom of Great Britain and Northern Ireland
Telephone	
Fax	
E-mail	geoff@additionalenergy.com
Website	www.additionalenergy.com
Contact person	Geoff Sinclair
Title	
Salutation	Mr
Last name	Sinclair
Middle name	
First name	Geoff
Department	
Mobile	+44 7780 706728
Direct fax	
Direct tel.	
Personal e-mail	

Coordinating/managing entity and/or responsible person/entity	<input type="checkbox"/> Coordinating/managing entity <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Additional Energy Limited
Street/P.O. Box	34B York Way
Building	
City	London
State/Region	
Postcode	N1 9AB
Country	United Kingdom
Telephone	+61 402643154
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E-mail	anil@additionalenergy.com
Website	www.additionalenergy.com
Contact person	Anil Bhatta
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	1 April 2015	Initial publication.

Decision Class: Regulatory
 Document Type: Form
 Business Function: Issuance
 Keywords: monitoring report, programme of activities