



Monitoring report form for CDM project activity
(Version 06.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

Title of the project activity	Recovery and Utilization of Associated Gas at Pondok Tengah LPG Plant – PT. Yudistira Energy	
UNFCCC reference number of the project activity	6008	
Version number of the PDD applicable to this monitoring report	9.1	
Version number of this monitoring report	01	
Completion date of this monitoring report	18/05/2019	
Monitoring period number	05	
Duration of this monitoring period	01/01/2018 to 31/12/2018 (first and last days included)	
Monitoring report number for this monitoring report	Not applicable as not batch project/monitoring report	
Project participants	1. PT Yudistira Energy (Indonesia) 2. Agrinergy Pte Ltd. (United Kingdom of Great Britain and Northern Ireland, Switzerland)	
Host Party	Indonesia	
Sectoral scopes	10 : Fugitive emissions from fuels (solid, oil and gas)	
Applied methodologies and standardized baselines	AM0009 ver. 6 - Recovery and utilization of gas from oil wells that would otherwise be flared or vented	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0	221,294
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	231,792	

SECTION A. Description of project activity**A.1. General description of project activity**

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1. The purpose of the proposed project activity is utilization of associated gas.
2. The project activity involves the installation of a new pipeline to recover and transport the associated gas and the construction of a LPG Plant to utilize it.
3. The project activity encompasses the establishment and operation of a new LPG Plant to recover and utilise the associated gas which had been flared at Tambun and Pondok Tengah Gas Collection stations owned by Pertamina EP Station - Pertagas (Pertamina EP and Pertagas are subsidiaries of PT Pertamina, the State Owned Oil & Gas Company), and also installation of new pipeline to connect Pondok Tengah- Pertamina EP Station with Yudistira's LPG Plant. The recovered gas is processed into LPG, Condensate and Lean Gas.
4. Total emission reductions achieved in this monitoring period is 221,294 tCO₂e.

A.2. Location of project activity

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1. Host Party (ies): Indonesia
2. Region/ State/ Province, etc.: West Jawa
3. City/ Town/ Community, etc.: Babelan Sub district, Huripjaya village, Bekasi District
4. Physical/ Geographical location: GPS coordinates 6.085806 S and 107.042564 E

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Indonesia (host)	PT Yudistira Energy	No
United Kingdom of Great Britain and Northern Ireland	Agrinergy Pte Ltd.	No

A.4. Reference to applied methodologies and standardized baselines

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Title and version: Approved baseline methodology AM0009 – “Recovery and utilization of gas from oil wells that would otherwise be flared or vented” - Version 06.0.0

- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion version 02;
- Tool for the demonstration and assessment of additionality version 06.0.0;
- Tool to calculate baseline, project and/or leakage emissions from electricity consumption version 01

Reference: <http://cdm.unfccc.int/methodologies/DB/ET4NXMVXFQ5C2EJ5L1OF8YZIEVLVDA>

A.5. Crediting period type and duration

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Crediting Period: 01/01/2013 – 31/12/2019 (Renewable)

Length of crediting period: 07 years 00 months

Start date: 01/01/2013

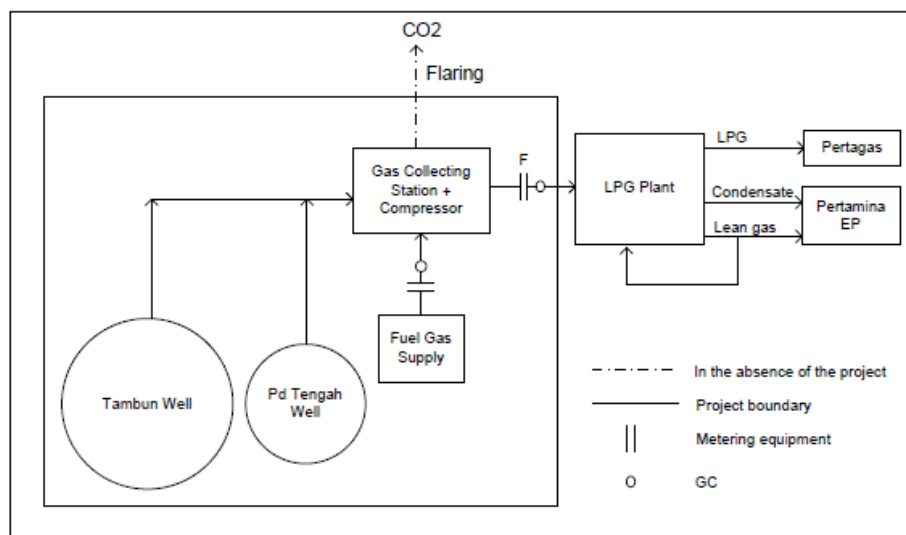
Current monitoring period: 01/01/2018 to 31/12/2018 - first & last days included

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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1. The purpose of the proposed project activity is utilization of associated gas. The project activity involves the installation of a new pipeline to recover and transport the associated gas and the construction of a LPG Plant to utilize it.
2. The pipeline and LPG Plant is designed to process 17 MMSCFD of gas into LPG, condensate and lean gas. The LPG Plant Pondok Tengah applies a refrigeration and condensation process for LPG and condensate recovery.
3. The final products of LPG, condensate and lean gas are produced through drying wet associated gas and then putting it through a distillation process to separate the dried gas hydrocarbon components. The project activity uses processing and basic engineering design from Mackenzie Hydrocarbons Australia, a design specialist established since 1990 which holds licences for the petroleum, petrochemical and power industries.
4. The project activity was commissioned on 03/03/2011, and the commercial operation started on 01/03/2011 (Initial Gas-in incl. for trial etc).



B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

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There are no deviations from the registered monitoring plan or applied methodology.

B.2.2. Corrections

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There are no corrections.

B.2.3. Changes to the start date of the crediting period

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There is no change to the start date of crediting period.

B.2.4. Inclusion of monitoring plan

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No

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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There are no any permanent changes from registered monitoring plan or applied methodology.

B.2.6. Changes to project design

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There are no changes to project design of registered project activity.

SECTION C. Description of monitoring system

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The project activity is implemented as mentioned in the registered PDD. No new technology measure or retrofits have been added during this verification period.

The information regarding the actual operation of the project activity during this monitoring period, including downtimes of equipment is given below,

From 01/01/2018 - 31/12/2018	
Total Number of Hours	8784.0
Downtime Hours	338.16
Operating Hours	8445.84

Monitoring procedures

All the data and parameters that need to be monitored are monitored under a monitoring plan to ensure that the emission reductions are going to be properly monitored and transparently recorded. Data collection is prepared by the Operator and checked by the Supervisor and approved by the Plant Manager. The project Operator collects the data, and the collected data checked by the Production Supervisor and approved by the Plant Manager. Data collection in the form of paper is archived electronically. Regular data back-up is conducted to guarantee the completeness of the electronic data.

Calibration of equipments

Standard method of instruments calibration in Yudistira is conducted in accordance to National Standard and ISO 9001:2000 article 7.6: Control Monitoring and Measuring Equipment. Calibration is done by accredited laboratory or Directorate of Metrology under Ministry of Trade. Calibration period is set based on equipment usage duration, calendar schedule or combination of both. In special cases, calibration will take place when measuring equipments show deviation from its fair value. Calibration schedule for metering system, including Feed Gas Flow meter Package and Fuel Gas Flow meter Package is held once per year.

Staff and Operator Training

The purpose of staff and operator training is to make sure all the personnel involved understand and know how to carry out the proper procedures for monitoring. The training for Operators is conducted by PT Yudistira Haka Perkasa as appointed operator for the project activity.

Emergency procedures

The plant maintains the data in both hard and soft copy formats. Agrinergy also receives the data from the plant and if any discrepancies are observed, questions are raised and corrections

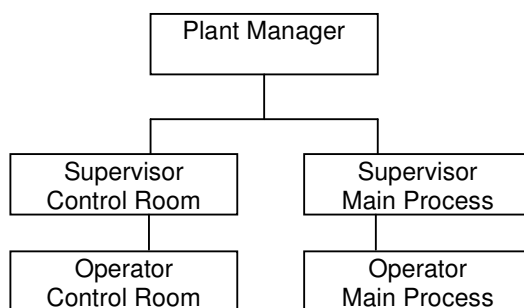
made accordingly. However, no emergencies occurred during the period under verification which could have given rise to emissions.

QA/QC procedure

The monitoring meters are calibrated according to national standards each year. The calibration certificates will be made available at the time of verification.

All data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later, and the storage of this data will be the responsibility of the project developers.

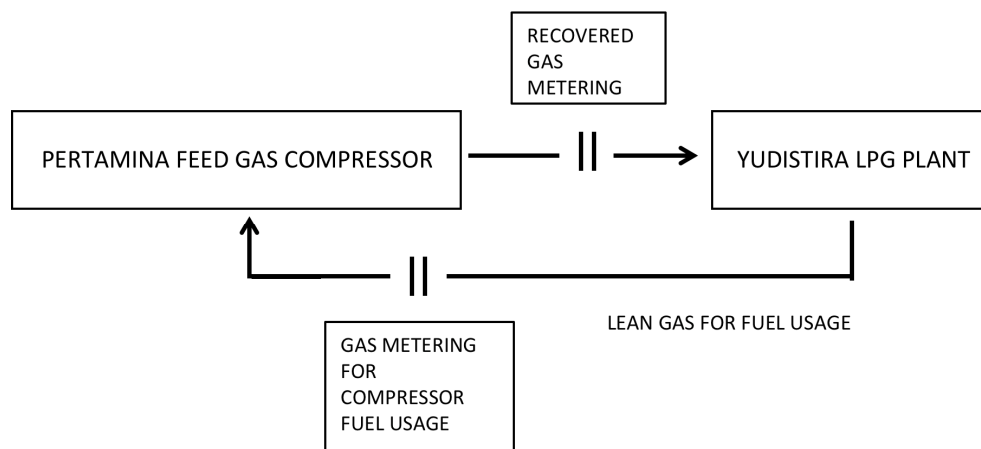
Organizational structure



Roles and responsibilities

Designation	Responsibility
Operator	Data collection
Supervisor	Data checking collected by plant operator
Plant Manager	Approve the final data collected by operator and checked by supervisor

The single line diagram showing all relevant monitoring points is given below,



SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante***(Copy this table for each data or parameter.)*

Data/Parameter	EF _{CO₂,Methane}		
Unit	tCO ₂ /TJ		
Description	CO ₂ emission factor for methane		
Source of data	Calculated in line with procedures and data presented in ISO 6976:		
	Unit	Value	Source
	Carbon Content of Methane	12,011 kg/kmol	ISO 6976: Table 1
	CO ₂ Emission Factor for Methane	44.01 kg/kmol	ISO 6976: Table 1
	NCV of Methane (at 250C)	802.60 kJ/mol	ISO 6976: Table 3
Value(s) applied	54.834		
Choice of data or measurement methods and procedures	As per AM0009 version 06.0.0, the CO ₂ emission factor for methane is included in the parameters that are not monitored.		
Purpose of data/parameter	Project emissions calculations		
Additional comments			

D.2. Data and parameters monitored*(Copy this table for each data or parameter.)*

Data/parameter:	$V_{F,y}$				
Unit	Nm ³				
Description	Volume of total recovered gas measured at point F in Figure B1 in year y				
Measured/calculated/default	Measured				
Source of data	On site measurement at point F as described in Figure B1 using Flow Meter				
Value(s) of monitored parameter	100,162,970.38				
Monitoring equipment:	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Minyak Dan Gas Bumi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	Pietro Fiorentini	2D1 DDDDED465D		
	Flow Computer	OMNI	1730101		
	Differential pressure transmitter	Yokogawa	91K652743-026		
	Static Pressure Transmitter	Yokogawa	91K652758-026	16/12/2017 16/12/2018	15/12/2018 15/12/2019
	Temperature transmitter	Yokogawa	C2K71 0093-028		
	Three pens recorder	ITT Barton	11785689003		
Measuring/reading/recording frequency:	Continuous measurement and monthly recorded				

Calculation method (if applicable):	-
QA/QC procedures:	The monitoring meters are calibrated according to national standards each year. In case of emergency when main metering cannot be used, Barton Chart as backup meter is used.
Purpose of data:	Baseline emissions calculations
Additional comments:	-

Data/parameter:	$NCV_{RG,F,y}$
Unit	TJ/Nm ³
Description	Net calorific value of recovered gas measured at point F in Figure B1 during the period <i>y</i>
Measured/calculated/default	Measured
Source of data	On site sampling of recovered gas from Tambun and Pondok Tengah at point F in Figure B1 for laboratory analysis (by accredited lab)
Value(s) of monitored parameter	0.00004439
Monitoring equipment	Third party laboratory analysis
Measuring/reading/recording frequency:	Monthly
Calculation method (if applicable):	-
QA/QC procedures:	Analysis of natural gas and similar gaseous mixtures by chromatograph as per GPA Standard 2261-00. Calculation of Gross Heating Value relative density and compressibility, factor of natural gas mixtures from compositional analysis as per GPA Standard 2172-00/ 2172/96. KAN (Komite Akreditasi Nasional) is ISO17025 accredited lab.
Purpose of data:	Baseline emission calculations
Additional comments:	The qualifier net is synonymous with lower and inferior and the term calorific value is synonymous with heating value.

Data/parameter:	$FC_{i,j,y}$
Unit	m ³ /year
Description	Quantity of gas fuel combusted in process <i>j</i> during the year <i>y</i>
Measured/calculated/default	Measured
Source of data	On site measurement in MMSCF unit and then converted to m ³ .
Value(s) of monitored parameter	7,582,040.50

Monitoring equipment	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Minyak Dan Gas Bumi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	TMCO	52741		
	Flow Computer	Kingfisher plus	171557		
	Differential pressure transmitter	ABB	6410010900	31/01/2017	30/01/2018
	Static Pressure Transmitter	ABB	6410010807	19/02/2018	18/02/2019
	Temperature transmitter	ABB	210000713382001		
	Three pens recorder	Cameron	111744557005		
Measuring/reading/recording frequency:	Continuously measured and monthly recorded				
Calculation method (if applicable):	-				
QA/QC procedures:	<p>The monitoring meters are calibrated according to national standards each year. Accuracy of the meter is +/- 1%.</p> <p>There was delay in calibration. The error observed during the calibration is found less than the accuracy class of the meters. Hence as per VVS the maximum permissible error (i.e. accuracy class) of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration is applied. The correction factor for delay in calibration is applied for the month of January 2018 and February 2018.</p>				
Purpose of data:	Project emission calculation				
Additional comments:	The consistency of metered fuel consumption quantities are crosschecked by the running hour of compressor in the period of monitoring.				

Data/parameter:	$NCV_{i,y}$
Unit	GJ/m ³
Description	Aaverage net calorific value of gas fuel in year y for combustion of compressor
Measured/calculated/default	Default
Source of data	IPCC default values at the upper limit of the uncertainty of 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) of monitored parameter	0.0504
Monitoring equipment	-
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	-
QA/QC procedures:	-

Purpose of data:	Project emission calculations
Additional comments:	-

Data/parameter:	$EF_{CO_2,i,y}$
Unit	tCO ₂ /GJ
Description	Weighted average CO ₂ emission factor of lean gas fuel in year <i>y</i> for combustion
Measured/calculated/default	Default
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) of monitored parameter	0.0583
Monitoring equipment	-
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Project emission calculations
Additional comments:	Since there is no CO ₂ emission factor provided, IPCC Guidelines value should be used.

D.3. Implementation of sampling plan

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Not Applicable

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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The formulae used to calculate the baseline emission is:

$$BE_y = V_{F,y} \cdot NCV_{RG,F,y} \cdot EF_{CO_2Methane}$$

BE_y Baseline emissions during the period *y*, (tCO₂e)

$V_{F,y}$ Volume of total recovered gas measured at point F in Figure B.1, after pre-processing and before the part of the recovered gas may be used on-site, during the period *y*, (Nm³)

$NCV_{RG,F,y}$ Net calorific value of recovered gas measured at point F in Figure B.1 during the period *y*, (TJ/Nm³)

$EF_{CO_2Methane}$ CO₂ emission factor for methane (tCO₂/TJ)

Month	$V_{F,y}$	$NCV_{RG,F,y}$	$EF_{CO_2, Methane}$	Baseline emissions
	Nm ³	TJ/Nm ³	tCO ₂ /TJ	tCO ₂
Jan-18	10120914.70	0.00004304	54.834	23885.25
Feb-18	7650702.72	0.00004316	54.834	18104.66
Mar-18	7323868.11	0.00004370	54.834	17551.69

Apr-18	8804191.65	0.00004398	54.834	21231.00
May-18	7665745.43	0.00004649	54.834	19541.88
Jun-18	8030908.21	0.00004528	54.834	19940.04
Jul-18	9063507.99	0.00004282	54.834	21282.77
Aug-18	8925968.76	0.00004445	54.834	21755.64
Sep-18	8061042.45	0.00004584	54.834	20261.59
Oct-18	7569571.14	0.00004481	54.834	18597.67
Nov-18	7849048.94	0.00004424	54.834	19040.31
Dec-18	9097500.28	0.00004486	54.834	22380.02
Total	100,162,970.38	0.00004439	54.834	243,572.51

$$BE_y = 243,572.51$$

E.2. Calculation of project emissions or actual net removals

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$$PE_y = PE_{FC,j,y}$$

Where:

PE_y Project emissions in the period y , (tCO₂e)

$PE_{FC,j,y}$ CO₂ emissions due to consumption of fossil fuels for the recovery, pre-treatment, transportation, and, if applicable, compression of the recovered gas during the period y , (tCO₂e)

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

$PE_{FC,j,y}$ The CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr)

$FC_{i,j,y}$ The quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr);

$COEF_{i,y}$ The CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)

i The fuel types combusted in process j during the year y

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

Month	FC _{i,j,y}	NCV _{i,y}	EF _{CO2,i,y}	Project emissions
	m ³ /yr	GJ/m ³	tCO ₂ /GJ	tCO ₂
Jan-18	799819.31	0.0504	0.0583	2350.13
Feb-18	520674.88	0.0504	0.0583	1529.91
Mar-18	547267.06	0.0504	0.0583	1608.05
Apr-18	657292.55	0.0504	0.0583	1931.34
May-18	586944.21	0.0504	0.0583	1724.63
Jun-18	614103.65	0.0504	0.0583	1804.43
Jul-18	693061.46	0.0504	0.0583	2036.44
Aug-18	682554.52	0.0504	0.0583	2005.56
Sep-18	616397.62	0.0504	0.0583	1811.17
Oct-18	575503.56	0.0504	0.0583	1691.01
Nov-18	596751.86	0.0504	0.0583	1753.45
Dec-18	691669.81	0.0504	0.0583	2032.35
Total	7,582,040.50	0.0504	0.0583	22,278.46

$$PE_y = 22,278.46 \text{ tCO}_2\text{e}$$

E.3. Calculation of leakage emissions

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No leakage emissions are considered in line with the methodology.

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	243,572.51	22,278.46	0	-	221,294.04	221,294 (round down to nearest integer)

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante (t CO ₂ e)
221,294	231,792

E.6. Remarks on increase in achieved emission reductions

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There is decrease in emission reductions by 4.53% during the current monitoring period relative to those estimated in the registered CDM-PDD. The estimation of emission reductions in the registered PDD over the period of this monitoring report is 231,792 tCO₂ (PDD estimate for year 2018). The decrease in emission reductions during the monitoring period is due to the difference in the data stated in the PDD estimate and the actual monitored data over the monitoring period. It is mainly due to the lower quantity of volume of total recovered gas (the volume of associated gas recovered is lower as oil production is lower from PT Pertamina's end) as compared to PDD estimate during the monitoring period.

Parameter	Unit	PDD estimate (for 12 months)	Monitored value (for 12 months)	Source
V _{F,y}	Nm ³	102,789,832	100,162,970	Monitored
NCV _{RG,F,y}	TJ/Nm ³	0.000046	0.00004439	Monitored
FC _{i,j,y}	m ³ /year	10,622,896	7,582,040	Monitored
NCV _{i,y}	GJ/Nm ³	0.0454	0.0454	IPCC default
EF _{CO2,i,y}	tCO ₂ /GJ	0.0583	0.0583	IPCC default

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • 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 <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • 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 GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, 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).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		