



**Monitoring report form for CDM project activity
(Version 07.0)**

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	04	
Version number of this monitoring report	02	
Completion date of this monitoring report	07/05/2020	
Monitoring period number	09	
Duration of this monitoring period	01/01/2020 to 31/03/2020 (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) 3. Agasco Limited (Australia) 4. ACT Financial Solutions B.V. (Netherlands)	
Host Party	Indonesia	
Sectoral scopes	1 : Energy industries (renewable - / non-renewable sources) 10 : Fugitive emissions from fuels (solid, oil and gas)	
Applied methodologies and standardized baselines	AM0009 ver. 7 - Recovery and utilization of gas from oil fields 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	41,193
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	35,857 ¹	

¹ Estimated CER as per PDD = 143,428 tCO₂e for 12 months
 No of monitoring months in this monitoring period = 03 month
 Therefore, estimated CER = 35,857 tCO₂e for 03 month

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 41,193 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
Australia	Agasco Limited	No
Netherlands	ACT Financial Solutions B.V.	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 fields that would otherwise be flared or vented” - Version 07.0

- Tool for the demonstration and assessment of additionality Version 07.0.0;
- Combined tool to identify the baseline scenario and demonstrate additionality Version 07.0;
- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion Version 03.0
- Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation Version 03.0
- Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period Version 03.0.1

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

A.5. Crediting period type and duration

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Crediting Period: 01/01/2020 – 31/12/2026 (Renewable)

Length of crediting period: 07 years 00 months

Start date: 01/01/2020

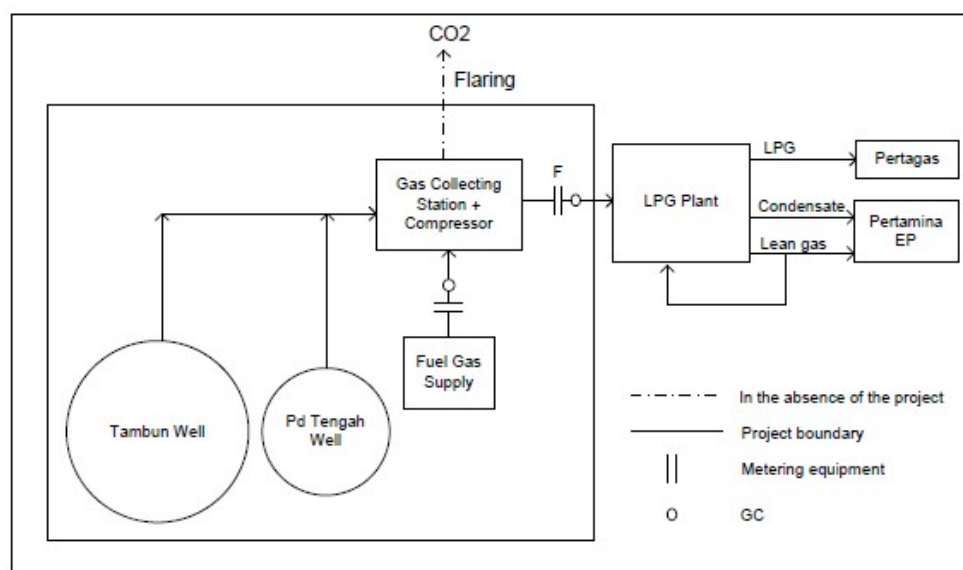
Current monitoring period: 01/01/2020 to 31/03/2020 - first & last days included

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 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.

B.2.7. Changes specific to afforestation or reforestation project activity

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Not Applicable

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 01/01/2020 - 31/03/2020		Reason for shutdown/ breakdown
Total Number of Hours	2184	-
Downtime Hours	103.6	Manual shutdown for carburettor repair
Operating Hours	2080.4	-

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 management structure for the monitoring is established as described in organizational structure below.

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 equipment's 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.

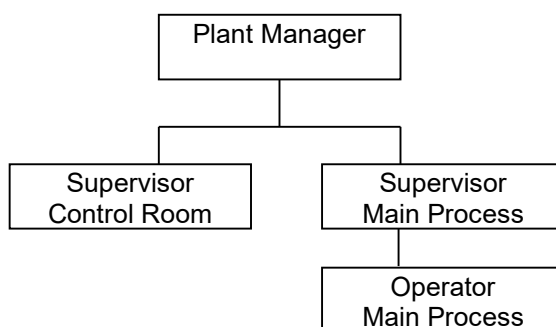
Data Collection and storage

The data collection is conducted and recorded in the frequencies and periods as explained in section B.7.1 of the registered PDD. The project Operator collect the data, and the collected data is 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. As per the methodology, all data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period.

Projection and adjustment of project and baseline emissions on the basis of oil production

The project as well as baseline emissions depend on the quantity of associated gas and gas-lift gas recovered, which is linked to the oil production. Oil production may be projected with the help of a reservoir simulator, reflecting the rock and fluid properties in the oil reservoir. As projections of the oil production, the methane content of the gas and other parameters involve a considerable degree of uncertainty, the quantity and composition of the recovered gas are monitored ex post and the baseline and project emissions are adjusted respectively during monitoring.

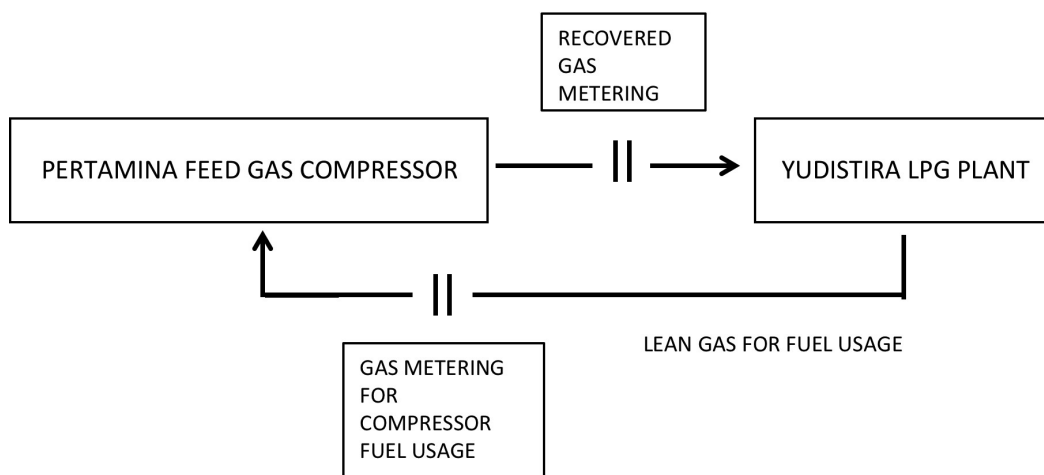
Organizational structure



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	CO2 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
	CO2 Emission Factor for Methane	44.01 kg/kmol	ISO 6976: Table 1
	NCV of Methane (at 25 ⁰ C)	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 07.0		
Purpose of data/parameter	Baseline 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 4 in year y
Measured/calculated/default	Measured
Source of data	Flow Meter
Value(s) of monitored parameter	196,18,397.90

Monitoring equipment:	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Perlindungan Konsumen Dan Terib Niaga , Direktorat Metrologi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	Pietro Fiorentini	2D1 DDEDED465D		
	Flow Computer	OMNI	1730101		
	Differential pressure transmitter	Yokogawa	91K652743-026		
	Static Pressure Transmitter	Yokogawa	91K652758-026	17/01/2019 17/01/2020	17/01/2020 17/01/2021
	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:	Calibration will be taken annually and/or when measuring equipment shows deviation from its tolerated fair value. Deviation from tolerated fair value can be identified by energy mass balance between feed gas as input and sum up of LPG, lean gas, condensate, and fuel gas. Accuracy of the meter is +/- 1%. 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 of Figure 4 during the period y
Measured/calculated/default	Measured
Source of data	On site sampling of recovered gas at point F in Figure 4 for laboratory analysis (Chemical analysis of gas sampled taken at point F of figure 4)
Value(s) of monitored parameter	0.00004149
Monitoring equipment	Third party laboratory analysis
Measuring/reading/recording frequency:	Monthly
Calculation method (if applicable):	-

QA/QC procedures:	Sampling in accordance with ISO 10715 or equivalent standard. Compositional analysis in accordance with ISO 6974 or equivalent standard. Routine maintenance and calibration in accordance with ISO 10723 or equivalent standard. GC calibration gases certified to ISO 6141 or equivalent standard. Annual manufacturer servicing and calibration to ISO17025 or equivalent standard. In case third party laboratories are used, these should as a minimum have ISO17025 accreditation or justify that they can comply with similar quality standards any KAN (Komite Akreditasi Nasional) is ISO17025 accredited lab.
Purpose of data:	Baseline emission calculations
Additional comments:	-

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 will be converted to m ³ .				
Value(s) of monitored parameter	1179,330.50				
Monitoring equipment	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Perlindungan Konsumen Dan Terib Niaga , Direktorat Metrologi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	TMCO	52741		
	Flow Computer	Kingfisher plus	171557		
	Differential pressure transmitter	ABB	6410010900	21/03/2019 10/05/2020	21/03/2020 10/05/2021
	Static Pressure Transmitter	ABB	6410010807		
	Three pens recorder	Cameron	111744557005		
Temperature transmitter	Azbil	R-90383-41-083			
Measuring/reading/recordin g frequency:	Continuously measured and monthly recorded				
Calculation method (if applicable):	-				
QA/QC procedures:	Accuracy of the meter is +/- 1%. There was delay in calibration. Hence as per CDM validation and verification standard for project activities Version 02 paragraph 366 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. On conservative side the correction factor for delay in calibration is applied for the month of March 2020.				
Purpose of data:	Project emission calculation				
Additional comments:	-				

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 y 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 Chapter1 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:	-

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:

$$BE_y = V_{F,y} \cdot NCV_{RG,F,y} \cdot EF_{CO2Methane}$$

BE_y Baseline emissions during the period y , (tCO₂e)

$V_{F,y}$ Volume of total recovered gas measured at point F in Figure 4, in year y , (Nm³)

$NCV_{RG,F,y}$ Net calorific value of recovered gas measured at point F in Figure 4 in year y , (TJ/Nm³)

$EF_{CO2Methane}$ CO₂ emission factor for methane (tCO₂/TJ)

Month	$V_{F,Y}$	$NCV_{RG,F,Y}$	$EF_{CO2, Methane}$	Baseline emissions
	Nm ³	TJ/Nm ³	tCO ₂ /TJ	tCO ₂
Jan-20	7129779.67	0.00004218	54.834	16491.24
Feb-20	6432776.27	0.00004062	54.834	14329.04
Mar-20	6055841.97	0.00004167	54.834	13838.02
Total	196,18,397.90	0.00004149	54.834	44,658.30

$$BE_y = 44,658.30 \text{ tCO}_2\text{e}$$

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

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

$NCV_{i,y}$ The weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)

$EF_{CO2,i,y}$ The weighted average CO₂ emission factor of fuel type i in year y (tCO₂/GJ)

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-20	427301.05	0.0504	0.0583	1255.55
Feb-20	385443.22	0.0504	0.0583	1132.56
Mar-20	366586.24	0.0504	0.0583	1077.15
Total	1179,330.50	0.0504	0.0583	3,465.25

$$PE_y = 3,465.25 \text{ tCO}_2\text{e}$$

E.3. Calculation of leakage emissions

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In line with the methodology, leakage is not considered as the recovered gas is not transported to processing plant where it is processed into hydrocarbon products and the dry gas compressed to CNG first the transported by trailers/trucks/carriers and then decompressed again before it finally enters the gas pipeline.

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	44,658.30	3,465.25	0	-	41,193.05	41,193 (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)
41,193	35,857

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

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Based on the registered PDD, the annual emission reductions estimated *ex ante* of the project is 143,428 tCO₂e. The duration of this monitoring period is 03 months, thus the total amount estimated *ex ante* for this monitoring period is (143,428 tCO₂e /12 months) x 3 months = 35,857 tCO₂e

E.6. Remarks on increase in achieved emission reductions

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Emission reductions over the three-month monitoring period are 14.88% above the annual PDD estimate on a pro rate basis. It should be noted that the current monitoring period covers only three months, and within any given 12-month period there will be months with above average CER generation and periods with below average and zero generation (due to e.g. outage and maintenance). The increase in emission reductions during the monitoring period reflects such monthly fluctuations and the short monitoring period. Moreover, emissions reductions are function of feed gas volumes and net calorific value of recovered gas will fluctuate within and between years. Across the first crediting period total achieved emissions reductions were 13.6% below the PDD estimate.

Parameter	Unit	PDD estimate (for 12 months)	PDD estimate (for 03 months)	Monitored value (for 03 months)	Source
$V_{F,y}$	Nm ³	61,487,008	15,371,752	19,618,397	Monitored
$NCV_{RG,F,y}$	TJ/Nm ³	0.000045	-	0.00004149	Monitored
$FC_{i,j,y}$	m ³ /year	3,685,271	921,318	1179,330	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

E.7. Remarks on scale of small-scale project activity

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Not Applicable

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
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.

<i>Version</i>	<i>Date</i>	<i>Description</i>
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		