



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	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 monitoring report	1.0	
Completion date of the monitoring report	29/12/2016	
Monitoring period number and duration of this monitoring period	02, 01/06/2015 to 31/10/2016 (first and last days included)	
Project participant(s)	1. PT Yudistira Energy (Indonesia) 2. Agrinergy Pte Ltd. (United Kingdom of Great Britain and Northern Ireland, Switzerland)	
Host Party	Indonesia	
Sectoral scope(s)	10 : Fugitive emissions from fuels (solid, oil and gas)	
Selected methodology(ies)	AM0009 ver. 6 - Recovery and utilization of gas from oil wells that would otherwise be flared or vented	
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	477,056 tCO ₂	
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
	0	324,551

SECTION A. Description of project activity

A.1. Purpose and 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 324,551 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 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)
Indonesia (host)	PT Yudistira Energy	No
United Kingdom of Great Britain and Northern Ireland	Agrinergy Pte Ltd.	No

A.4. Reference of applied methodology and standardized baseline

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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 of project activity

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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: 01/06/2015 to 31/10/2016 - first & last days included

A.6. Contact information of responsible persons/entities

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Sachin Nagarkar

Agrinergy Consultancy Pvt. Ltd.,

sachin.nagarkar@agrnergy.com

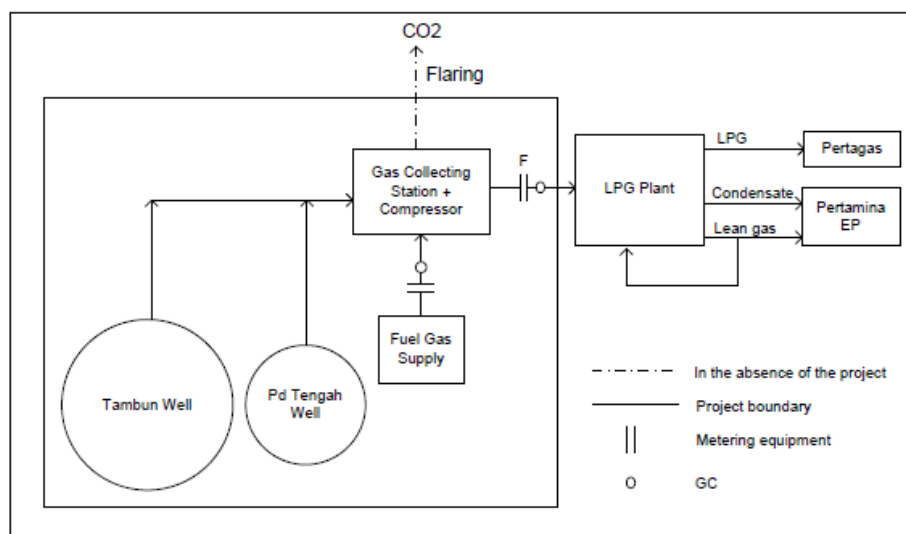
The entity is not a project participant. The details of project participant are given in Appendix 1.

SECTION B. Implementation of project activity

B.1. Description of implemented registered 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 registered monitoring plan, applied methodology or applied standardized baseline

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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 start date of crediting period

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

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

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No

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

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

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

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

B.2.7. Types of 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.

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 took 2 months and conducted by PT Yudistira Haka Perkasa as appointed operator for the project activity.

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.

Emergency procedures

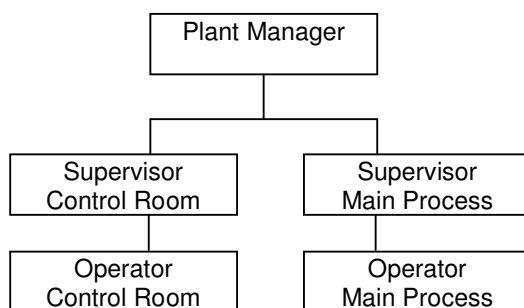
The plant maintains the data in both hard and soft copy formats. Agrinergy also receives the data from the plant and if any discrepancies are observed, questions are raised and corrections made accordingly. However, no emergencies occurred during the period under verification which could have given rise 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.

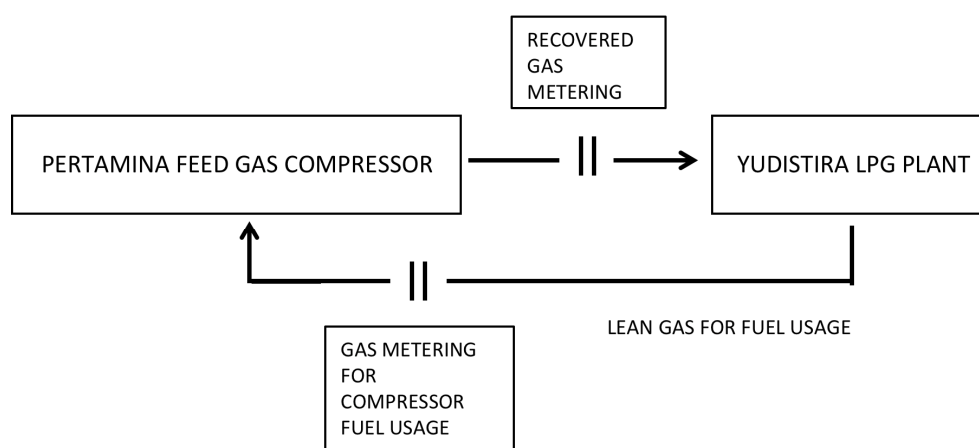
Organizational structure



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 or at renewal of crediting period

(Copy this table for each piece of data and 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	Project emissions calculations		
Additional comments			

D.2. Data and parameters monitored

(Copy this table for each piece of data and 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	85279974.51 (01/06/2015-31/12/2015) 59833225.72 (01/01/2016-31/10/2016)

Monitoring equipment:	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Minyak Dan Gas Bumi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	Pietro Florentini	201 000804650		
	Flow Computer	OMNI	10730101		
	Differential pressure transmitter	Yokogawa	91K652743-026		
	Static Pressure Transmitter	Yokogawa	91K652758-026	20/10/2014	19/10/2015
	Temperature transmitter	Yokogawa	C2K71 0093-028		
	Three pens recorder	Barton	11785689003		
	Pelat orifice	-	149.10		
Measuring/reading/recording frequency:	Continuous measurement and monthly recorded				
Calculation method (if applicable):	-				
QA/QC procedures:	Calibration is taken annually and/or when measuring equipments show 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 in Figure B1 during the period y
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	0.00004486 (01/06/2015-31/12/2015) 0.00004483 (01/01/2016-31/10/2016)
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.
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.
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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	6481251.77 (01/06/2015-31/12/2015) 4516765.79 (01/01/2016-31/10/2016)				
Monitoring equipment	Calibrating frequency: Annual, Calibrating agency: Direktorat Jenderal Minyak Dan Gas Bumi				
	Equipment	Make	Serial no	Calibration date	Valid till
	Orifice fitting	Pietro Florentini	52741	04/02/2015	03/02/2016
	Flow Computer	Kingfisher plus	171557		
	Differential pressure transmitter	ABB	6410010900		
	Static Pressure Transmitter	ABB	6410010807		
	Temperature transmitter	ABB	210000713382001		
	Three pens recorder	Barton	111744557005		
	Pelat orifice	Crane	69.10		
Measuring/reading/recording frequency:	Continuously measured and monthly recorded				
Calculation method (if applicable):	-				
QA/QC procedures:	Accuracy of the meter is +/- 1%.				
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 <i>y</i> 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:	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 GHG removals by sinks

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

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The formulae used to calculate the baseline emission is:

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 emission
	Nm ³	TJ/Nm ³	tCO ₂ /TJ	tCO ₂
Jun-15	13364146.13	0.00004483	54.834	32851.25
Jul-15	13348139.34	0.00004483	54.834	32811.90
Aug-15	13151753.04	0.00004504	54.834	32484.42
Sep-15	10294386.86	0.00004483	54.834	25305.28
Oct-15	12744664.40	0.00004483	54.834	31328.46
Nov-15	11294262.25	0.00004483	54.834	27763.14
Dec-15	11082622.49	0.00004483	54.834	27242.89
Jan-16	10259490.23	0.00004483	54.834	25219.50
Feb-16	9045032.57	0.00004483	54.834	22234.16
Mar-16	5242486.55	0.00004483	54.834	12886.89
Apr-16	3919855.56	0.00004483	54.834	9635.64
May-16	5273058.62	0.00004483	54.834	12962.04
Jun-16	5655454.55	0.00004483	54.834	13902.03
Jul-16	6272132.54	0.00004483	54.834	15417.92
Aug-16	4096663.83	0.00004483	54.834	10070.27
Sep-16	4985715.09	0.00004483	54.834	12255.70
Oct-16	5083336.17	0.00004483	54.834	12495.67
Total	145,113,200.23	0.00004484	54.834	356,867.16

$BE_y = 356,867.16 \text{ tCO}_2\text{e} \text{ (01/06/2015 – 31/10/2016)}$

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

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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

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y}$$

Month	FC _{i,j,y}	NCV _{i,y}	EF _{CO2i,y}	Project emissions
	m ³ /yr	GJ/m ³	tCO ₂ /GJ	tCO ₂
Jun-15	1016312.66	0.0504	0.0583	2986.25
Jul-15	1020702.35	0.0504	0.0583	2999.15
Aug-15	1009034.27	0.0504	0.0583	2964.87
Sep-15	782667.80	0.0504	0.0583	2299.73
Oct-15	970971.40	0.0504	0.0583	2853.02
Nov-15	841659.59	0.0504	0.0583	2473.07
Dec-15	839903.71	0.0504	0.0583	2467.91
Jan-16	784197.11	0.0504	0.0583	2304.22
Feb-16	691871.99	0.0504	0.0583	2032.94
Mar-16	392353.44	0.0504	0.0583	1152.86
Apr-16	291956.95	0.0504	0.0583	857.86
May-16	394449.16	0.0504	0.0583	1159.02
Jun-16	422005.10	0.0504	0.0583	1239.99
Jul-16	469470.40	0.0504	0.0583	1379.45
Aug-16	320447.47	0.0504	0.0583	941.58
Sep-16	370433.31	0.0504	0.0583	1088.45
Oct-16	379580.86	0.0504	0.0583	1115.33
Total	10,998,017.56			32,315.69

$$PE_y = 32,315.69 \text{ tCO}_2\text{e} \text{ (01/06/2015 – 31/10/2016)}$$

E.3. Calculation of leakage

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No leakage emissions are considered in line with the methodology.

$$L_y = 0 \text{ tCO}_2\text{e}$$

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

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO 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	356,867.16	32,315.69	0	0	324,551.47	324,551 (round down to nearest integer)

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 (t CO ₂ e)	477,056	324,551

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

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There is decrease in emission reductions 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 $477,056 \text{ tCO}_2$ $((7/12)*336,746 + (10/12)*336,746)$. The decrease in emission reductions during the monitoring period is due to less quantity of volume of total recovered gas as compared to PDD estimate.

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

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	PT. Yudistira Energy
Street/P.O. Box	Jl. Kapten Tendean Kav. 28
Building	BPH MIGAS Building 1 st Floor
City	Jakarta
State/region	DKI Jakarta
Postcode	12710
Country	Indonesia
Telephone	+62 21 520 2633
Fax	+62 21 525 5703
E-mail	
Website	www.yudistiraenergy.com
Contact person	
Title	Director
Salutation	Mr
Last name	Ruwiyadi
Middle name	
First name	Iwan
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	yudistira@agrinergergy.com

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Agrinergergy Pte. Ltd.
Street/P.O. Box	59 Mohamed Sultan Road
Building	Sultan Link # 01-08
City	
State/Region	Singapore
Postcode	238999
Country	Singapore
Telephone	+65 6933 5360
Fax	
E-mail	
Website	
Contact person	
Title	Director
Salutation	Mr

Last name	Atkinson
Middle name	
First name	Ben
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	ben.atkinson@agrinergy.com

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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 (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		