



VALIDATION REPORT

SOUTH POLE CARBON ASSET MANAGEMENT LTD.

**PROJECT KAMOJANG UNIT 5 PT.
PERTAMINA GEOTHERMAL ENERGY**

REPORT NO.
CDM.12.VAL.052



Date of this issue: 26/10/2012		KBS Ref. No.: CDM.12.VAL.052	
Organisational Unit:		Client:	
Climate Change Division, KBS		South Pole Carbon Asset Management Ltd.	
Project Design Document			
First PDD:		Final PDD:	
Version: 01.0		Version: 01.6	
Date: 25/05/2012		Date: 24/10/2012	
Summary of validation:			
South Pole Carbon Asset Management Ltd. has commissioned KBS to perform the validation of the proposed CDM project activity:			
Project Title:		Project Kamojang Unit 5 PT. Pertamina Geothermal Energy	
Methodology Applied:		ACM0002, Version-13.0.0	
Sectoral Scopes:		01:Energy industries (renewable sources)	
Validity of methodology/ies (for RfR):		valid from 11/05/2012 onwards	
<p>The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the latest version of CDM Validation and Verification Standard, Project Cycle Procedure and Project Standard, Kyoto Protocol requirements and UNFCCC rules.</p> <p>The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools, guidance's and CDM decisions.</p> <p>The review of the project design documentation and the subsequent follow-up interviews have provided KBS with sufficient evidence to determine the project's fulfillment of all the stated criteria. In our opinion, the project meets all applicable UNFCCC requirements for the CDM.</p>			
<ul style="list-style-type: none"> - <input checked="" type="checkbox"/> Will be recommended to the CDM Executive Board with a request for registration 			
		Validation Status:	<input type="checkbox"/> Findings not closed <input type="checkbox"/> Draft validation report <input checked="" type="checkbox"/> Final validation report
Project type:	Large scale		
Subject:	CDM Validation		
Validation Team:		Document Distribution	
Team Leader: Abhishek Mahawar Validator: Phool Chand Local Expert: Yenni Sembiring Technical Expert (TA 1.2): Phool Chand Financial Expert: Abhishek Mahawar		<input checked="" type="checkbox"/> No Distribution without permission from the Client <input type="checkbox"/> Limited Distribution <input type="checkbox"/> Unrestricted Distribution	
Technical Review Team:		Manager T&C	
Technical Reviewer: Sunil Kathuria Date: 07/11/2012 Technical Expert: Sanjay Kandari		Name: Ashok Kumar Gautam Date: 22/11/2012	
Authorized by:			
Name: Kaushal Goyal, Managing Director			
Date: 22/11/2012			
Rev Number:	Date:		
0	12/10/2012		
1	26/10/2012		



Abbreviations

ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology for Small-scale
BE	Baseline Emissions
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CM	Combined Margin
CER	Certified Emission Reduction
CL	Clarification request
COP	Conference of Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
DPR	Detailed Project Report
DR	Document Review
EB	Executive Board
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GSC	Global Stakeholder Consultation
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
JAMALI	Java-Madura-Bali
KP	Kyoto Protocol
LSC	Local Stakeholder Consultation
LE	Leakage Emissions
LoA	Letter of Approval/Authorization
ISO	International Organization for Standardization
MOP	Meeting of Parties
MoC	Modalities of Communication
MoV	Means of Verification
MP	Monitoring Plan
OM	Operating Margin
PA	Project Activity
PDD	Project Design Document
PE	Project Emissions
PLF	Plant Load Factor
PLN	Perusahaan Listrik Negar
PP	Project Participant
PPA	Power Purchase Agreement
PS	Project Standard
PSD	Project Start Date
PO	Purchase Order
PCP	Project Cycle Procedure
QA/QC	Quality Assurance/Quality Control
RfR	Request for Registration
SD	Sustainable Development
T&C	Technical & Certification
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation & Verification Standard



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1. Validation Opinion

KBS Certification Services Pvt. Ltd. has been contracted by **South Pole Carbon Asset Management Ltd.** to perform a validation of the project:

Project title: **Project Kamojang Unit 5 PT. Pertamina Geothermal Energy**

Host Party: Republic of Indonesia

The validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism, latest version of Validation and Verification Standard and related Standards/Guidance and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The proposed CDM project activity will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change. In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria.

The project correctly applies methodology ACM0002, V13.0.0. It is demonstrated that the project is not a likely baseline scenario. The emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be 1,096,683 tCO₂e over a 7 year crediting period during 01/01/2014 to 31/12/2020, averaging 156,669 tCO₂e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achievable given the underlying assumptions do not change.

The project will hence be recommended by KBS for request for registration with the UNFCCC.

Authorized Signatory

Signature:

Name: Kaushal Goyal

Place: Faridabad, Haryana, India

Date: 22/11/2012



2. Introduction

2.1 Objective

South Pole Carbon Asset Management Ltd. has commissioned KBS to perform the validation of the project: **Project Kamojang Unit 5 PT. Pertamina Geothermal Energy** with regard to the relevant requirements for Clean Development Mechanism (CDM) project activities.

The purpose of validation is to ensure a thorough, independent assessment of proposed CDM project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.

In particular, the project's baseline, the monitoring plan (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. The validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reduction (CER).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

2.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. KBS has employed a rule-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.



3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available PDD Version 01 dated 25/05/2012 and the subsequent versions and version 01.6 dated 24/10/2012 (final version). The assessment is performed by a validation team using a validation protocol attached as Annex 1. The cross checks between information provided in the PDD and information from sources other than those used, if available, the validation team's sectoral or local expertise and, if necessary, independent background investigations has been used and reported, wherever appropriate.

3.2 Site Visit

The site visit was undertaken by Abhishek Mahawar (Team Leader, Financial Expert), Phool Chand (Validator and Technical Expert) and Yenni Sembiring (Local Expert), the details are mentioned below;

Location:	Ibun subdistrict, Bandung regency, West Java Province, Indonesia	
Dates:	03/07/2012	
Key points discussed:	Name of person, interviewed	Designation, Organization
Host Country rule and regulations related to project activity, project description, project management plan	Made Budy Sartono	PT Pertamina Geothermal Energy (PGE)
Baseline and Monitoring plan	Priatna B	PGE
Project description, baseline, additionality and monitoring plan	Arrie T Setiawan	South Pole Carbon Asset Management Ltd
Project description, baseline, additionality and monitoring plan	Dimas R	PGE
Project description, baseline, additionality and monitoring plan	Tesa	PGE
Environmental Impact Analysis, approval process, stakeholder consultation process	Nindita W R	PGE
Stakeholder consultation process	Mimin	Local Villager
Stakeholder consultation process	Ating	Local Villager
Stakeholder consultation process	Yayam M	Local Villager
Stakeholder consultation process	Ana Sujana	Local Villager

3.3 Major Milestones in validation

Validation Contract	25/05/2012
Publication of PDD	29/05/2012 to 27/06/2012
On site validation	03/07/2012
Draft Validation Report	12/10/2012
Final Validation Report	26/10/2012

3.4 Use of the Validation Protocol

The validation protocol used for the assessment is designed in accordance with the latest version of Validation and Verification Standard. It serves the following purposes:

- Reference to available information relating to projects or technologies similar to the proposed project activity under validation;
- Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations.
- Organises, details and clarifies the requirements the project is expected to meet; and



- Documents both how a particular requirement has been validated and the result of the validation (reporting).

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Validation Assessment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex **Error! Reference source not found.** to this report

3.5 Findings

As an outcome of the validation process, the validation team can raise different types of findings

A Clarification Request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met

Where a non-conformance arises the validator shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

A Forward Action Request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

08 Corrective Action Requests and 02 Clarification Requests are raised in the draft validation protocol and detailed in a separate finding document (Annex 2). In this document, the project participant is given the opportunity to “resolve” the outstanding CARs and respond to CLs and FARs.

3.6 Internal Quality Control

Following the completion of the assessment process and a recommendation by the assessment team, the validation opinion prepared by Team Leader is independently reviewed by internal Technical Reviewer. TR reviews if all the KBS procedures have been followed and all conclusions are justified in accordance with applicable standards, procedures, guidance and CDM decisions. The TR either is qualified for the technical area within the CDM sectoral scope(s) applicable to project activity or is supported by qualified independent technical expert at this stage.

The Technical Reviewer will either accept or reject the recommendation made by the assessment team. The findings can be raised at this stage and PP must resolve them within agreed timeline.

The opinion recommended by Technical Reviewer will be confirmed by Manager Technical & Certification and finally authorized by the Managing Director on behalf of KBS as final validation opinion. The Technical Reviewer and Manager T&C maybe be same person.



4. Validation Findings

4.1 Approval

Discussion:

The PDD indicates that the project activity is a bilateral CDM project. The Parties involved are Republic of Indonesia and Switzerland. The host Party of the project activity is Republic of Indonesia, which has ratified the Kyoto Protocol on 28th July 2004^{/5/}. The Designated National Authority (DNA) of Republic of Indonesia is the National Council on Climate Change, Indonesia.

The Annex I Party participating in the project activity is Switzerland, which has ratified the Kyoto Protocol 09th July 2003. The Federal Office for the Environment (FOEN), Climate Division of Switzerland, is the DNA of Switzerland.

The validation team confirms that the project participants are listed in tabular form in section A.4 of the PDD and this information is consistent with the contact details provided in Appendix-1 of the PDD. The below table summarizes the project participants and Parties involved.

Project participants	PT. Pertamina Geothermal Energy	South Pole Carbon Asset Management Ltd.
Parties involved	Republic of Indonesia (Host)	Switzerland
Approval		
LoA received	Yes	Yes
Date of LoAs	18/09/2012 ^{/5/}	20/07/2012 ^{/5/}
Reference Number	B 103/KNMPB/09/2012 ^{/5/}	G514-3487 ^{/5/}
LoAs issued by	National Council on Climate Change, Republic of Indonesia	Federal Office for the Environment (FOEN)
LoAs received directly from	PP	PP
Validation of authenticity	The validation team was able to check other LoA (UN Ref: 5773 & 5785) issued by the DNA of Indonesia (host) and by comparing the contents, confirms that LoA is authentic.	The validation team was able to check the details of LoA issued from the official website of the DNA of Switzerland " http://www.bafu.admin.ch/emissionshandel/05556/05558/index.html?lang=en " and confirms that LoA is authentic and valid for the proposed CDM project activity.

The validation team was able to check that name of the project title and project participant are same in LoA issued by respective DNAs^{/2/5/}.

Official Development Assistance (ODA):

The validation did not reveal any evidence that this project activity will utilise funds from official development assistance. Based on information provided in PDD^{/1/2/} and document review, it is clear that the project activity will be entirely funded by the owners equity. Moreover, the PP has provided a letter of undertaking dated 02/08/2012, confirming no use of ODA for the proposed project activity^{/28/}.

Findings:

CL#01, please refer Annex-2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that:

- The letters of approval from respective DNAs have been issued
- The letter is received directly from the PP.



- (c) The letters of approval is authentic and the same has been confirmed by checking the other LoA issued from DNA of respective parties. The validation team does not doubt the authenticity of the provided LoAs.
- (d) The letter of approval confirms that, the Parties involved are a Party to the Kyoto Protocol, Participation is voluntary, the proposed project activity contributes to the sustainable development of the host country and it refers the precise proposed project activity title as mentioned in the final PDD being submitted for registration.
- (e) The letters of approval are unconditional to Paragraphs 39 a) to d) of VVS V02.0.
- (f) The letters of approval are issued by DNA of Republic of Indonesia and DNA of Switzerland, and are valid for the proposed project activity under validation. The authenticity of the LoAs is confirmed by comparing the similar LoA issued by respective DNA. The validation team does not doubt the authenticity of the provided LoAs.

4.2 Authorization

Discussion:

The host Party for the project activity is Republic of Indonesia and has ratified the Kyoto Protocol on 28th July 2004. This has been confirmed from the link (<http://maindb.unfccc.int/public/country.pl?country=ID>).

The Annex-I Party participating in the project activity is Switzerland. Switzerland has ratified the Kyoto Protocol on 09th July 2003. This has been confirmed from the link (<http://maindb.unfccc.int/public/country.pl?country=CH>)

The project participants listed in the section A.4 of the PDD version 01 are

- 1) PT. Pertamina Geothermal Energy
- 2) South Pole Carbon Asset Management Ltd.

The PDD of the proposed CDM project activity was webhosted on UNFCCC website for global stakeholder consultation process to invite comments as per CDM requirements from 29/05/2012 to 27/0/2012. The link for PDD on UNFCCC website is as under

<http://cdm.unfccc.int/Projects/Validation/DB/ANJO7JKEA511RZI6XBLC57UA8J16WB/view.html>

Opinion:

The assessment team confirms that:

- a) The participation of each project participants listed in PDD has been approved/authorized by the DNA of respective Party (ies)
- b) The participation has been confirmed in the LoAs itself, which contains the names of the PP to which it is issued
- c) The information is consistent within the project documentation viz., PDD^{/2/}, LoA^{/5/} and signed MoC^{/6.1/}.

4.3 Sustainable Development

Discussion:

The validation team has interviewed PP and local villagers & stakeholders during the site visit, and confirm that the project activity will generate temporary employment during development of geothermal fields and construction of power plant and permanent job opportunity will be created by the Project Activity during operation of geothermal power plant. The Audit Team confirms that the Project has facilitated the infrastructure development of the area, Local peoples are engaged temporarily in the project construction thus increasing their incomes. Also the Project will provide clean energy locally and displace pollutions generated in fossil fuel fired power plants. This proposed project will also pay the geothermal tax^{/26/} to the state budget.

PDD clearly mentions the project contribution to sustainable development of the host country and the same is also confirmed by the DNA of Republic of Indonesia in letter of approval dated 18/09/2012^{/5/}.

Opinion:

The validation team confirms based on the letter of approval received for the project activity from the host Party that proposed project activity contributes to sustainable development in Republic of Indonesia.

4.4 Modalities of Communication

Discussion:



As required in “Procedures for Modalities of Communication between Project Participants and the Executive Board”, the PP has submitted Modalities of Communication (MoC)^{6.1/}, the assessment team has verified that the names of primary authorized signatory Mr Renat Heuberger and alternate authorized signatory as Mr Christoph Grobbel from South Pole Carbon Asset Management Ltd. for future communication related to the corresponding scope of authority with UNFCCC. The authenticity of the specimen signature and other details is cross checked from the letter by PT. Pertamina Geothermal Energy dated 06/09/2012^{6.2/} and notarized document by South Pole Carbon Asset Management Ltd. dated 22/05/2012^{6.3/}, confirming the designation and specimen signature of authorized personnel. The same has also been confirmed during site visit by reviewing the corporate identity of authorized signatory mentioned in MoC^{6.1/}.

The assessment team can confirm that the signatory and contact details on the MoC^{6.1/} are authorized and credible, the MoC is prepared using latest version of F-CDM-MOC form and “Procedures for modalities of communications between project participants and the Executive Board”. The MOC^{6.1/} is correctly filled including the Modalities of Communication statement (Annex-1) and Statement of Agreement (Section-3).

Findings:

CL#01, please refer Annex-2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that:

- The MoC is correctly filled using the latest F-CDM-MOC form V02.1
- The MoC is directly received from the PP
- The specimen signature, designation and name of the authorised personnel is cross checked from the letter issued and provided by PP confirming the specimen signature, name and designation of authorised personnel.
- The modalities of communication statement is correctly filled and including the specimen signature of authorised signatory.

4.5 Project Design Document

Discussion:

The PDD applied the Project Design Document Form (CDM-PDD), version 04.1^{42/}, which is a valid form available on UNFCCC/CDM website. The validation team confirms that the PDD is completed in accordance with the “Guidelines for Completing the Project Design Document”, version-01.0 <http://cdm.unfccc.int/Reference/Guidclarif/index.html#pdd>^{42/}

Findings:

CAR#02, please refer Annex-2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that the PDD is being prepared in accordance with the latest valid template and guidance from the CDM Executive Board available on the UNFCCC CDM website.

Key revisions between the final PDD against the first version published for the international stakeholder consultation	
PDD Section no.	Brief description of the changes
Cover page	Annual emission reduction changed from 157,946 tCO ₂ to 156,669 tCO ₂ .
A.1.	Annual emission reduction changed from 157,946 tCO ₂ to 156,669 tCO ₂ . Emission reduction over chosen crediting period is changed from 1,105,622 tCO ₂ to 1,096,683 tCO ₂ Baseline and sectoral scope is incorporated
A.2 .4	Physical Map is incorporated Technical details of the project activity has been included
A.3	Project life time is included as 30 years, the flow diagram showing measure equipment and mass energy flow is included



B.1	The version of additionality tool is changed from version 6.0.0 to version 6.1.0.
B.2	The applicability criteria of the methodology is revised as per later version of applied methodology ACM0002,V13.0.0
B.3	The flow diagram of project boundary is included
B.4	The description on national policies and circumstances relevant to project activity included Combined margin emission factor changed from 0.741 tCO ₂ /MWh to 0.740 tCO ₂ /MWh.
B.5.	The date of CDM prior intimation to UNFCCC is changed from 30/08/2010 to 12/10/2010 The date of ERPA changed from April 2012 to 17/04/2012. The benchmark value and approach changed from Weighted Average Capital Cost (22.74%) to Cost of equity (17.91%) (as its 100% equity the WACC will also give the same result for later) The inflation rate is added as 4.808%. The project cost is changed from 84.6 million US\$ to 83.2 million US\$. The IRR value changes from 15.35% to 14.47% and the value of sensitivity analysis changes accordingly. Common practice analysis has been revised to make in line with latest guideline.
B.6.1, B.6.2,	The equation to calculate project emission is corrected Combined margin emission factor, build margin emission factor and operating margin emission factor is included as 0.740 tCO ₂ /MWh, 0.712 tCO ₂ /MWh and 0.769 tCO ₂ /MWh respectively. Combined margin emission factor changed from 0.741 to 0.740 tCO ₂ /MWh
B.6.3	Baseline emission is changed from 175,261 tCO ₂ /year to 175,024 tCO ₂ /year The total steam quantity changes from 1,892,160 tonnes/year to 2,005,690 tonnes/year Project emission changes from 7,315 tCO ₂ /year to 18,355 tCO ₂ /year
B.7.2	The sampling approach is being added in parameter ($W_{\text{steam,co2,y}}$ and $W_{\text{steam,CH4,y}}$)
B.7.1	The calibration frequency for energy and steam meter is added as once a year. The value of net electricity supplied to grid ($EG_{\text{facility,y}}$) corrected as 236, 520 MWh/year
E.1	The date of invitation and media used to invite stakeholder is added.
Appendix	Appendix-4, 5, 6 is added

4.6 Project Description

Discussion:

The proposed project activity is to set up a 31.8 MW^(7/|8/) steam turbine to utilize the steam from geothermal resources in mountain area of Kamojang. The location of the proposed project activity is Ibun-sub district, West Java province, Indonesia, which is approximately 70 km south of Bandung^(7/). The geographical coordinates of the project site is 7.1397642° South, 107.7898070° East^(2/), which has also been confirmed during site visit by GPS reading.

The proposed project will have single cylinder, multistage, condensing steam turbine directly coupled with generator. The superheated steam discharged from production well will be fed to steam turbine through scrubber and demister at a temperature and pressure of 170° C and 7 Bar^(8/), with expected gross electricity generation of 250.711 GWh at a plant load factor of 90%^(9/). The plant is expected to supply the net electricity of 30MW^(7/) (236.52 GWh annually) after deducting the auxiliary consumption of 1.8MW^(7/|9/) (14.191 GWh) to Jamali interconnected grid^(9/) through Perusahaan Listrik Negara (PLN) a state owned Electricity Company.

The steam at turbine exhaust will be fed into condenser, where the non-condensable gases will be removed and discharged. The project activity will reduce an estimated annual emission reduction 156,669^(4/) tCO₂e.



The proposed technology was approved as part of a feasibility study report, presented to PLN for getting approval, the project participants has used the final values as an input to the financial analysis for the investment decision purposes ^{7/}.

The technical specifications including the installed capacity and the rated output of the project activity have been verified from the Feasibility Study Report (FSR)^{7/} and technical specification of the project activity submitted to PLN^{8/} and also confirmed by interviewing with technical representative of the PP during the site visit^{32/}. During site visit it was observed that there were other power plants operational in Kamojang area, however the validation team confirmed that proposed project activity will not share any of the existing facilities (steam pipeline, geothermal wells, control systems etc) of other power plants operational. Hence, validation team confirms that proposed project activity is a new geothermal power plant.

The PDD mentions the start date as 10/01/2011^{11/} which was the date of work order for equipment mobilization for construction of first well and the life time of the project activity will be 30 years confirmed by reviewing the similar projects operational and literature available on geothermal projects^{40/}. According to the PDD, a renewable crediting period of 7 years with maximum of 2 renewals has been chosen by the PP for the project activity. The start date as work order for equipment mobilization for construction first well for the project activity, which in accordance with the definition of start date in glossary of CDM terms^{19/}, which appears to be the first real action and financial commitment by the PP towards implementation of the project activity, the validation team considers the date 10/01/2011^{11/} is the start date of the project activity.

The PP has signed power purchase agreement (PPA)^{9/} with PLN, the parameters mentioned e.g. installed capacity and plant load factor has been confirmed from PPA. The proposed project activity has obtained all necessary local and national statutory clearances till date by virtue of obtaining the EIA^{23/} clearance from Ministry of Environment, water concession and forest utilization permit.

The validation team has further confirmed that the project activity is new project and the project description provided in PDD by interviewing the technical personnel involved in development of Kamojang geothermal project unit V during the site visit on 03/07/2012^{22/}.

Findings:

CAR#02 & CAR#07 please refer Annex2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that

(a) The project description as mentioned in PDD^{2/} is validated by reviewing the feasibility study report, PPA, technical specification submitted to PLN and the same has also been confirmed during site visit by interviewing the technical personnel involved in project activity and government officials.

(b) Based on discussion above the assessment team confirms that project description provided in PDD^{2/} is complete and accurate.

(c) The validation team has conducted site visit for the proposed project activity on 03/07/2012^{22/}.

4.7 Baseline and monitoring methodology

4.7.1 General requirement

Discussion:

The project applies the approved methodology for proposed CDM project activity categories, "Consolidated methodology for grid-connected electricity generation from renewable sources" (ACM0002.) V13.0.0^{20/}, which also uses the "Tool to calculate the emission factor for an electricity system" version 02.2.1^{12/}.

Opinion:

- a) The validation team is of opinion that applied approved baseline and monitoring methodology is approved by UNFCCC and PDD has used the version of the applied baseline and monitoring methodology that is valid at the time of request for registration.
- b) The PDD has mentioned and correctly applied the tools and guidance relevant as per applied methodology.

4.7.2 Applicability of selected methodology to the project activity

Discussion:



The project activity is a new grid connected geothermal energy based power project; and the installed rated capacity of the proposed project will be 31.8 MW^{7/}. The validation team has verified the technical parameters from the approved FSR^{7/}. The applicability condition of the approved methodology ACM0002, V13.0.0^{20/} and the “Tool to calculate the emission factor for an electricity system” V2.2.1^{12/} referred to in the approved methodology, in context of project activity is demonstrated in PDD^{2/}. The summary of the project compliance with applicability criteria is listed below:

Applicability conditions in V13.0.0 of ACM0002	Characteristics of the project activity	Means of Validation
<p>This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (green field plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).</p>	<p>The project is a grid-connected renewable power generation that install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity</p>	<p>The validation team has verified the information from FSR^{7/} provided by the PP, the same has been further confirmed during site visit and found acceptable.</p>
<p>The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;</p>	<p>The project is an installation of geothermal power plant / unit.</p>	<p>The validation team has verified the information from FSR^{7/} and provided by the PP and confirms that project activity is a geothermal power plant; the same has been further confirmed during site visit and found acceptable.</p>
<p>In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;</p>	<p>Not applicable</p> <p>The project is not a capacity addition, retrofits or replacements. It is a development of new power generation facility.</p>	<p>During site visit the validation team observed that there is an existing geothermal power plant by PP, however, the proposed CDM project activity will not share any of the existing facilities (steam header, pipeline, and geothermal well). The project activity is a new project and same has been further confirmed by reviewing the FSR^{7/} and PPA^{9/} provided by the PP. This clause is not relevant in project case.</p>
<p>In case of hydro power plants: One of following conditions must apply:</p>		<p>Since this is not a hydro power plant</p>



<ul style="list-style-type: none"> Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m². 	<p>switching from fossil fuels to renewable energy sources at the site of the project activity.</p> <ul style="list-style-type: none"> This project activity is not a biomass fired power plant. <p>This project activity is not a hydro power plant.</p>	<p>site visit^{/22/}.</p> <p>The project is not biomass fired power plant.</p> <p>This is not relevant to project activity.</p>
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The validation team has assessed the applicability requirements and cross-verified with the supporting information and interviewed the PP, in consultation with local expertise and sector expert, and confirms that the project activity meets all the applicability conditions of the methodology ACM0002 V13.0.0^{/20/}

Findings:

CAR#03 & CAR#10, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The validation team confirms that

- The applicability conditions of the selected approved methodology ACM0002 V13.0.0^{/20/} is appropriately described in PDD.
- The validation of each relevant applicability conditions is described above
- The applied methodology is applicable in the context of the proposed CDM project activity.

4.7.3 Project boundary

Discussion:

The project boundary includes the project’s power plant and all the power plants physically connected to the electricity system that the project power plant is connected to the Jamali interconnected grid with all the power generating stations connected to it, is considered as the electricity system. The project boundary has been validated through site visit at the project site confirming the project features.

The system boundary is justified transparently and is presented below.

	GHGs involved	Description
Baseline emissions	CO ₂	Major emission source, which is emitted from the electricity generation by fossil fuel-fired power plants connected to JAMALI interconnected grid. The baseline emission factor is calculated as per applied tool to calculate emission factor of an electricity system.
Project emissions	Fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	As per applied approved methodology the emission of non-condensable gases (CO ₂ and CH ₄) will be accounted and monitored in the steam field-power plant interface using ASTM E1675 “Standard Practice for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis” (as applicable to sampling single phase steam only).
	N ₂ O	Minor emission source
Leakage	N/A	The project being a renewable resource based power project is required to consider the leakage as per ACM0002 only, if energy generating equipment is transferred from other project. The project activity does not involve the transfer of equipment, hence leakage is considered as “zero”.

Further, based on review of the final PDD and site visit the validation team considers that the PDD^{/2/} has included all the sources of emission within project boundary and there are no sources of GHG emission left



out which will contribute more than 1% of expected annual emission reduction by the project activity, which are not addressed by the applied methodology.

Findings:

CAR#02, please refer Annex2 of this report, where same is discussed completely.

Opinion:

- a) The accuracy and completeness of the project boundary mentioned is PDD^{/2/} is validated by the review of Feasibility Study Report^{/7/}, Power Purchase Agreement^{/9/}, interviewing the technical personnel involved in the project activity and on site observation^{/22/}.
- b) The identified boundary and selected sources and gases are justified for the project activity.
- c) The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0002 V13.0.0^{/20/}.
- d) The validation team confirms that PDD has correctly identified and included all the sources of GHG emission relevant to project activity, as per methodology ACM0002 V13.0.0^{/20/}.

4.7.4 Baseline identification

Discussion:

The project activity is an installation of a new grid connected renewable resource (geothermal energy) based power plant. The PP has identified the plausible baseline scenario in accordance with applied approved baseline methodology ACM0002, V13.0.0^{/20/}, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" to the proposed project activity under consideration. According to methodology if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"^{/12/}.

As mentioned in the earlier sections of the report, the project activity under consideration generates electricity by harnessing geothermal energy, and the electricity produced is fed into the Jamali grid of Indonesia. Thus displacing electricity produced in the grid by using carbon intensive fossil fuels. In the absence of the project activity, the same amount of electricity would have been produced in the grid, thus the baseline of the project activity are the emissions generated by generation of electricity in the Jamali grid of Indonesia.

The PDD^{/2/} has correctly identified the electricity system as Java-Madura-Bali (Jamali) grid in accordance with applied tool in section B.4 and B.6.1. The project activity will dispatch the net electricity generated to Jamali grid, the same has been verified from PPA^{/9/} and confirmed during site visit^{/22/}.

Operating Margin (OM) and Build margin (BM) emission factors are correctly taken from the Emission Factor of Jamali grid published by DNA of Indonesia on its official website^{/43/} and is available on public domain is reliable data source available to PP. The value referred for operating margin emission factor (OM) and build margin emission factor was the latest version available at the time of submission of PDD^{/1/} for web hosting. Validation Team has reviewed the correctness of data used for the baseline determination by reviewing the information on emission factor of Jamali grid on DNA website^{/43/}. The same has also been confirmed by DNA via email^{/23/}.

In accordance with "Tool to calculate the emission factor for an electricity system", the emission factor can be calculated by one of the following options:

- a) Either by calculating combined margin (CM) consisting of the combination of operating margin (OM) and build margin (BM)

Or

- b) By calculating weighted average emissions in the current generation mix.

PP has calculated CM by opting the option (a) i.e. calculating combined margin (CM) consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the



'Tool to calculate the Emission Factor for an electricity system' which is further calculate on the basis on operation margin (OM) and build margin (BM).

The validation team was able to check, that the data vintage used (2008, 2009 and 2010)^{/43/} for emission factor calculation was the most recent data available on electricity generation and dispatch to Jamali grid in Indonesia at the time of uploading the PDD for global stakeholders comment on UNFCCC website.

The simple OM emission factor was calculated as the generation-weighted average CO₂ emissions per unit of net electricity generation (tCO₂/MWh) of all generating power plants serving the system for year 2008, 2009 and 2010, as 0.769 tCO₂e/MWh^{/43/}(fixed ex-ante). In calculating above low-cost/must-run power plants units were not included.

The weighted average CO₂ emission factor of build margin was calculated as the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

The assessment team checked independently by visiting the DNA office of Indonesia and confirms that the selection of the options was correct. In validating this step, assessment team further confirms that:

- (i) the identified power capacity additions comprise 20% of the system generation for the year under consideration.
- (ii) none of the considered power capacity additions considered under (i) above have been built more than ten years earlier.

The weighted average of build margin emission factor for year 2010 is calculated as 0.712 tCO₂e/MWh^{/43/} (fixed ex-ante).

This is in line with the guidance provided in the "Tool to calculate the emission factor for an electricity system". The combined margin emission factor for the Jamali grid of Indonesia have been calculated to be 0.740 tCO₂e/MWh^{/3/} by applying the weightage for OM and BM as 50:50. The combined margin emission factor is fixed ex ante for the entire renewal crediting period.

The baseline identified in section B.4 and B.5 of the PDD^{/2/} is consistent and in accordance with applied approved methodology ACM0002, V13.0.0^{/20/}.

In addition to this, in accordance to Annex 3 of EB 22, there are no relevant national or sectoral policies and circumstances, which have impact on the identification of the baseline scenario. The same is rightly explained in section B.4 of the PDD^{/2/} for this type of project activities.

Findings:

CAR#04 & CAR#07, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that

- a) The assumptions, calculations and rationales used for identification of baseline scenario are correctly quoted and interpreted in the PDD along with their sources and references.
- b) The national/sectoral regulations relevant to project activity have been considered, which establishes that no existing regulations impair the baseline scenario as identified in PDD.
- c) The assessment team was also able to check the authenticity of the data/sources used against emission factor of Jamali grid from information available on official website of DNA of Indonesia^{/43/} and same is also confirmed by reviewing the emission factor calculation details by visiting the DNA office on 09/07/2012.
- d) The identification (assumptions and data used) of baseline scenario to the project has been correctly applied and is in accordance with applied approved methodology ACM0002, V13.0.0^{/20/} and justified, deemed reasonable and is based on objective evidences in context to the project activity.
- e) The identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

4.7.5 Algorithms and/or formulae used to determine emission reductions

Discussion:

The PDD (along with annexure) has described the applied approved methodology ACM0002 V13.0.0^{/20/} under section B.6.1, B.6.2 and B.6.3.

**Baseline emissions:**

The baseline emissions are demonstrated in Section B.6.1 of PDD^{/2/} and are calculated using following equations (equation 6 of the methodology):

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

The expression $EG_{PJ,y}$ is synonymous to the expression $EG_{facility,y}$ for new renewable energy power plants for this project activity which involves the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, in accordance with equation 7 of the methodology

Therefore, the final derived equation, in the context of new project activity is as under;

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

The determination of $EF_{grid,CM,y}$ is already explained in the previous section of this report, which is in accordance with the applied methodology and applicable tool for this purpose. The calculated value is 0.740 tCO₂e/MWh^{/3/} for $EF_{grid,CM,y}$.

The $EG_{facility,y}$ is determined based on the difference of the gross generation of 250.711 GWh^{/7/} and 14.191 GWh parasitic load, which is consistent with the Feasibility Study Report^{/7/}, technical specification^{/8/} and therefore the value applied for the estimated net electricity export to grid.

$$EG_{facility,y} = 250.711 - 14.191 \text{ GWh/year}$$

$$EG_{facility,y} = 236.52 \text{ GWh/year}$$

The baseline emission is calculated using equation above as

$$BE_y = 236.5 \times 1000 \times 0.740$$

$$BE_y = 175,024.8 \text{ tCO}_2\text{e/year}$$

The baseline emission reduction value has been rounded off to 175,024 tCO₂e/year, which is conservative.

Project emissions:

The project emission is calculated using equation

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

where:

PE_y Project emissions in year y (tCO₂e/yr)

$PE_{FF,y}$ Project emissions from fossil fuel consumption in year y (tCO₂/yr)

$PE_{GP,y}$ Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e/yr)

$PE_{HP,y}$ Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)

As the project activity is a geothermal power plant, $PE_{HP,y} = 0$.

Further, it was confirmed during onsite assessment that the power plant will have a DG sets for emergency backup and to be used in case of grid failure or other exigency conditions, hence $PE_{FF,y} = 0$, which is in conformity with applied approved methodology.

Hence, $PE_y = PE_{GP,y}$

The emission from non-condensable gases from operation of geothermal power plant is calculated using equation below

$$PE_{GP,y} = (w_{\text{steam,CO}_2,y} + w_{\text{steam,CH}_4,y} \cdot GWP_{\text{CH}_4}) \cdot M_{\text{steam,y}}$$

The average mass fraction of carbon di-oxide in produced steam is estimated as (0.0089467023 tCO₂/tone steam) and average mass fraction of methane in produced steam is estimated as (0.0000097278 tCH₄/tone steam). The values are based on test reports on existing geothermal power plant operational close to project site. The validation team was able to cross check the same and confirms that the value used for calculation of project emission is reasonable and appropriate^{/54/}. However, the actual values based on sample test report will be used during the operation of the project for calculation of emission reduction. The net quantity of steam produced 2,005,690^{/8/7/} ton/year and global warming potential of methane is 21.



The project emission is calculated as

$$PE_{GP,y} = (0.0089467023 + 0.0000097278 \times 21) \times 2,005,690$$

$$= 18,354.04 \text{ tCO}_{2e}/\text{year}$$

$$PE_{GP,y} = 18,355 \text{ tCO}_{2e}/\text{year (rounded up)}$$

While the leakage is zero (refer section B.6.1 and B.6.3 of PDD and methodology), the emission reductions are equal to the baseline emissions less project emission due to the project activity.

The GHG emissions reduction calculations are transparently documented and appropriate assumptions regarding the expected amount of electricity generated have been used to forecast emission reductions. According to the applied formulae in the PDD, the emission reductions (ER_y) by the project activity during the crediting period is the difference between the baseline emissions (BE_y), project emissions (PE_y) and emissions arising from leakage (LE_y), which is expressed as follows:

$$ER_y = BE_y - PE_y - LE_y$$

The annual emission reduction is calculation as

$$ER_y = 175,024 - 18,355 - 0$$

$$ER_y = 156,669 \text{ tCO}_{2e}/\text{year}$$

Findings:

CAR#07 & CAR#10, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The assessment team confirms that

- All assumptions and data used by the project participants are listed in the PDD^{/2/}, including their references and sources;
- All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD^{/2/};
- All values used in the PDD^{/2/} are considered reasonable in the context of the proposed CDM project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD^{/2/}.

4.8 Additionality

The PP has demonstrated additionality of the project activity using “Tool for the demonstration and assessment of additionality” version-06.1.0, annex-20 EB 69^{/14/} and “Guidelines on the assessment of investment analysis” version-5, annex-05, EB 62^{/13/}.

4.8.1 Prior consideration of the clean development mechanism

Discussion:

The start date of the project activity mentioned in PDD V01.0 was 10/01/2011^{/1/} as the date of work order for equipment mobilization for first well drilling (i.e. start of construction activity), the start date mentioned is after August 02, 2008. The investment decision for the proposed project activity was made on 12/07/2010^{/10/}. The PP had informed host Party DNA and UNFCCC secretariat in writing of their intention to seek CDM status on 30/08/2010^{/50/} and 12/10/2010^{/50/} respectively, which was prior to the start date of the project activity and prior to the publication of the PDD for GSP i.e.29/05/2012^{/42/}. The PP has followed “Guidelines on the demonstration and assessment of prior consideration of the CDM” version-04, annex 13, EB 62 Report^{/15/}.

Further the project developer has signed Emission Reduction Purchase Agreement with South Pole Carbon Asset Management Ltd dated 17/04/2012^{/25/}, which was prior to the uploading of the PDD for GSP.

The validation team has reviewed the documents^{/27//11/&/29/} as per chronology of events mentioned in the PDD and confirmed that there has been no commitment of expenditure related to implementation, construction or real action prior to work order for equipment mobilization for drilling of first well for proposed CDM project activity, hence the date of work order for equipment for well drilling was considered the first real action



towards implementation of project activity, which was considered start date (10/01/2011) for proposed CDM project activity.

Based on the document review and site visit the assessment team was able to establish that project activity is a new project and the start date mentioned in PDD i.e. 10/01/2011^{/11/}, is in line with CDM glossary of terms, V06^{/19/} and validation team concludes that the CDM was seriously considered for proposed project activity.

Findings:

CAR#05, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The validation team confirms that

- a) Based on document review^{/50//51//11/} and site visit conducted on 03/07/2012^{/22/}, the assessment team establishes that project activity is new project and the date of work order for mobilisation of equipment for well drilling i.e. 10/01/2011^{/11/}, is considered as the earliest financial commitment and real action towards implementation of the project activity, which is in line with the "glossary of CDM terms"^{/19/}V-06.0, Annex-63, EB 66 Report.
- b) It has cross checked the name of the project activity in the list of notification received by the UNFCCC available from the UNFCCC website^{/42/}. The PP has notified to CDM EB and DNA of host country regarding their intention to seek the CDM status of the proposed project activity dated 12/10/2010^{/50/} and 30/08/2010^{/50/} respectively, which is prior to start date of the project activity.
- c) The prior CDM consideration is duly ascertained in accordance with the para 107 of VVS V2, as relevant to the project activity.

4.8.2 Identification of alternatives

Realistic alternatives to the proposed project activity are defined in section B.5 of the PDD^{/2/}. The elaboration is in accordance with the methodological tool for the demonstration and assessment of additionality. The validation team considers the alternatives to be credible and complete.

The identified alternatives in PDD are not prohibited by any legal/regulatory requirements, this has been further confirmed by the assessment team by discussion with PP and through the local expertise (included in the assessment team) on host country requirement relating to project activity.

Thus, assessment team confirms that as per paragraph 115 VVS V 02.0^{/18/}, the description of alternatives and supportive documents used are appropriate and satisfactory.

4.8.3 Investment analysis

Discussion:

The PDD mentions that project activity will generate financial and economic benefits by sale of generated electricity to Jamali grid of Indonesia; hence Option (I) simple cost analysis is not applicable to the project activity. The investment comparison analysis method (option II) is applicable to projects whose alternatives are also investment projects, however the alternative baseline scenario of the proposed project is the continuation of the supply of electricity by the Jamali grid rather than a comparable investment project, therefore option II is also not an appropriate method, hence, the benchmark analysis is chosen for project investment analysis.

As the project activity has only alternative baseline scenario is supply of electricity from Jamali grid, hence option III) the benchmark analysis is appropriate option for projects investment analysis as per tool for the demonstration and assessment of additionality.

Benchmark Selection:

The project activity is electricity generation based on geothermal energy which could be developed by an entity other than project participant. The benchmark should thus be based on publicly available data sources. In PDD V1.0^{/1/} the additionality was demonstrated by comparing the post tax project IRR with benchmark calculated as weighted average capital cost (WACC). The benchmark value 22.74%^{/2/} was calculated using the information available on public domain and was the basis for the investment decision to proceed with the project activity.



However, the validation team has observed that the benchmark value calculated was higher than benchmark value (19.67%) used for other geothermal project developed by PP and registered as CDM project^{42/}.

Moreover, it was also noted that FSR^{7/} was the basis for input values used for investment analysis, and the detailed review of FSR reveals that the proposed project activity was conceptualized considering means of finance as 100% owners equity. The validation team has raised a corrective action request and clarification on appropriateness of approach for benchmark selection.

In response the PP has revised the benchmark value 17.91%^{14/} (as the means of finance has been changed to 100% owner's equity the cost of equity will be equal to WACC), calculated using default value from the "Appendix" of Annex 05 of EB 62^{14/} and long term inflation rate for the host country, same has been compared with post tax equity IRR, the approach was found appropriate. Further the validation team has compared the benchmark value used by PP for other registered CDM projects (UN Ref: 5773 & 5785, WACC (benchmark) 19.67%, investment decision date 21/01/2010)^{43/}, wherein the cost of benchmark value was observed higher than considered for proposed project activity. It was also noted that the benchmark used for earlier project was valid for proposed project given short gap in investment decision date approximately 6 months. Considering above the validation team concludes that revised benchmark value i.e. 17.91%^{14/} is conservative and same is accepted.

The project activity will be entirely funded by owner's equity (100%)^{26/} and an equity benchmark (post tax) has been selected as benchmark indicator and has been compared against the post tax equity IRR for the project. The cost of equity required to invest in the project activity is calculated using the default value of cost of equity for host country (Indonesia) published in Appendix of Annex-5 of EB 62 report^{14/}.

Cost of equity 12.5%^{14/} (in real terms) for the host country (Indonesia) has been sourced from the "Appendix" of Annex 05 of EB 62, and thereafter the inflation (4.808%)^{44/} has been added by adopting the standard accounting principles to convert the real values in to the nominal. The long term inflation forecast for host country has been sourced from Link:

<http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?pr.x=41>

The assessment team has reviewed the website and found the value used as correct.

$$\begin{aligned} \text{Cost of equity (Nominal)} &= (\text{Cost of equity in real terms}+1) * (\text{Inflation Rate}+1) - 1 \\ &= (1+0.125) * (1+0.04808) - 1 \\ &= 17.91\% \end{aligned}$$

It was observed by the validation team that the default values (Cost of Equity) used for benchmark calculation was not available at the time of investment decision. However, the validation team has accepted the benchmark based on the default value in accordance with the principle of conservativeness.

The benchmark is considered as 17.91%^{14/} (Cost of equity in nominal terms) for comparing with post tax equity IRR.

Findings:

CAR#06 & CAR#10, please refer Annex2 of this report, where same is discussed completely.

Input Parameter:

The input values used in investment analysis sourced from the Feasibility Study Report (FSR), which was prepared dated 05/2010^{7/}. The FSR was the basis for the board decision dated 12/07/2010^{10/} to proceed with proposed project activity. The gap between preparation of FSR (05/2010) and investment decision (12/07/2010) was very short; hence validation team confirms that the input values used would have not changed materially.

As per host country regulation the approval of FSR with financial parameter is not mandatory and the PP has secured approval based on the technical specification for proposed project activity submitted to PT PLN (National Electricity Company). However, the validation team has independently checked the authenticity of the input values used in investment analysis by reviewing the literature published on geothermal power project development from host country as well as internationally and concluded that the values used are reasonable and appropriate. The same has been validated in table below under input parameters.

The validation team was able to check the authenticity of the values used in Feasibility Study Report by interviewing the officials of host country and same has also been confirmed by the local expert of the team during site visit.



The validation team has compared the input parameters used for the investment analysis^{/4/} in PDD^{/2/} with the parameters stated in final FSR^{/7/} and was able to confirm that values used applied are consistent with the values stated in FSR^{/7/}.

The validation team has validated the input parameters used in investment analysis of the project activity i.e. equity IRR, as listed in the PDD^{/2/} along with input values used in spread sheet. The detailed assessment and means of validation of input parameters used are presented below

Parameter	Value Used	Source of Value	Reference used cross checking
Gross installed capacity	31.8 MW	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	As the purchase order for the turbine is not yet placed, the validation team has cross checked the value from technical specification of the proposed project activity submitted to PT PLN (PERSERO) for approval, wherein the gross installed capacity (including auxiliary load) is mentioned as 31.8 MW ^{/7/} . The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit ^{/22/} . Hence, validation team considers the value used as appropriate.
Net installed capacity	30 MW	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	The net installed capacity was cross checked with PPA signed between PT. Pertamina Geothermal Energy and PLN (a state owned company) dated 11/03/2011 ^{/9/} . The net installed capacity was also checked with technical specification for proposed project activity submitted to PT PLN (PERSERO) ^{/8/} . The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit ^{/22/} . The value used is found consistent. Hence, validation team considers the value used as appropriate.
Plant Load Factor	90%	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	The validation team was able to cross check the value from the PPA signed between PT. Pertamina Geothermal Energy and PLN (a state owned company) dated 11/03/2011 ^{/9/} , wherein PLF mentioned as 90%, hence validation confirms that the PLF values used is in accordance with paragraph 3 (a) of Annex 11, EB 48 ^{/16/} . The validation team has reviewed the paper "Geothermal Heat and Power" published by Energy Technology System Programme dated May 2010, wherein under Table-5 Summary Table-Key Data and Figures for Geothermal Heat and Power Technologies, the average plant load factor for geothermal power plant is mentioned as 80% considering 95% machine availability ^{/34/} . The validation team has further reviewed Paper prepared in March 2001 by the International Geothermal Association for the World Energy Council Working Group on "Performance of Renewable Energy Plants", wherein based on



			<p>analysis of 10 geothermal power plants in Japan and Italy the PLF is observed as 84.2% to 89.3% considering machine availability as 92.1%^{/35/}.</p> <p>Also the paper “A guide to geothermal energy and the environment” published by Geothermal Energy Association dated 22/04/2005, mentions the capacity factor for geothermal energy as 89% to 97% , considering 95% machine availability^{/36/}.</p> <p>Based on review of literature on geothermal energy it can be observed that plant load factor varies from project to project depending upon steam type and steam quality and grid availability etc and 90% PLF is appropriate for geothermal power plant.</p> <p>The validation team has also compared the plant load factor 90% from the registered CDM projects from Indonesia (UN Ref: 5785, 5773). The value used by proposed project activity 90% is same.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit.</p> <p>Hence validation team considers the value used is appropriate and reasonable.</p>
<p>Tariff rate (US\$/MWh)</p>	<p>90</p>	<p>The value is sourced from the Feasibility Study Report^{/7/}, the same has verified and found consistent.</p>	<p>The validation team was able to cross check the value from PPA signed for proposed project activity between PT. Pertamina Geothermal Energy and PLN (a state owned company) dated 11/03/2011^{/9/}, wherein the electricity tariff agreed as floor price 82.5 US\$/MWh with an escalation. The escalation will be calculated as</p> $\text{Tariff} = \text{floor price} * (0.6 + 0.4 * (Yw/Yb))$ <p>Where,</p> <p>Yw, is average index U.S. PPI all commodities on quarter before billing month</p> <p>Yb, is average index U.S. PPI all commodities on quarter before commercial operation date</p> <p>Considering historical trend of US Producer Price Index, validation team analyses that the long-term expected annual escalation in index will be approx. 3%^{/52/} and the levelised electricity tariff for 30 years for considering the same escalation will be 97.8 US\$/MWh, which is well within sensitivity range of 10%.</p> <p>The validation team has reviewed the paper on “Geothermal in Indonesia: Government Regulation and Power Utilities, Opportunities and Challenges of its Development” published in Proceeding World Geothermal Congress 2010, dated 25-30 April 2010, wherein the electricity tariff for IPPs in Indonesia is mentioned as .06-0.08 US\$/kWh^{/37/}.</p> <p>Further, the PPA signed between PP and utility company is for 30 years, hence, the probability of revision of tariff to project activity in this period will be unlikely.</p>



			<p>The validation team has also compared the electricity tariff used by recently registered CDM projects from Indonesia (UN Ref: 5785, 5773), which varies from 42 US\$/MWh to 90 US\$/MWh. The value used for investment analysis 90 US\$/MWh is equivalent to highest tariff used ever by projects in Indonesia.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit.</p> <p>Hence validation team considers that value used 90 US\$/MWh for the investment analysis is reasonable and appropriate.</p>
Total project cost (in million US\$)	83.2	<p>The value is sourced from the Feasibility Study Report⁷¹, the same has verified and found consistent.</p> <p>The breakup of project cost is as below (in thousand US\$)</p> <p>Land acquisition, road and & drilling location-600</p> <p>Rig Mob/Demob-2000</p> <p>Cost of exploration well-9000</p> <p>Cost of production well-13500</p> <p>Cost of injection well-4500</p> <p>Production test-1000</p> <p>Gathering system (piping cost)-6000</p> <p>Plant and machinery-45,000</p> <p>Transmission-600</p> <p>Resource Study-50</p> <p>Environment-150</p> <p>Development cost-800</p> <p>Total-83,200</p>	<p>As the purchase order for plant and machinery has not been placed yet, the validation team has independently checked the input values from international literature on geothermal power projects:-</p> <p>The validation team has reviewed the paper "Geothermal Heat and Power" published by Energy Technology System Programme dated May 2010, wherein under Table-5 Summary Table-Key Data and Figures for Geothermal Heat and Power Technologies, the average project cost for geothermal power plant comparable to proposed project activity is mentioned as 3400 US\$/kW to 4500 US\$/kW^{34/}.</p> <p>The validation team was also able to check the project cost per kW for geothermal project as 3400 US\$/kW from official website of Geothermal Energy Association^{41/}.</p> <p>The value used by proposed project activity i.e. 2773.33 US\$/kW is lower.</p> <p>The project cost has also been compared with recently registered CDM projects from Indonesia (UN Ref: 5785, 5773), where the project cost ranges from 1200 US\$/kW to 2463.18 US\$/kW. However, it is observed that installed capacity of referenced project is 110MW (3.6 times larger than proposed project) and as per the study paper "Cost of Geothermal Power and Factors that Affects It" by Subir K Sanyal dated January 2004^{38/}, the project cost significantly decreases with increase in installed capacity (as per 2004 cost assumptions per kW project cost for a project with installed capacity 30 MW was 18.93% higher than project with installed capacity 100 MW).</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit.</p> <p>Based on above discussion, validation team considers the value (2773.73 US\$/kW) used is reasonable and appropriate.</p>



<p>O&M cost (in million US\$)</p>	<p>2.4</p>	<p>The value is sourced from the Feasibility Study Report^{7/}, the same has verified and found consistent. The O&M cost is including (upstream and downstream).</p>	<p>The validation team was able to cross check the O&M cost from study paper “Geothermal Heat and Power” published by Energy Technology System Programme dated May 2010, wherein under Table-5 Summary Table-Key Data and Figures for Geothermal Heat and Power Technologies, the average O&M cost for geothermal power plant comparable to proposed project activity is mentioned as 120 US\$/kW/annum^{34/}. The O&M for proposed project is 80 US\$/kW/annum, which is lower. The validation team has further check the O&M cost from website (http://www.eere.energy.gov/geothermal/faqs.html), where the O&M cost mentioned as 10 US\$/MWh to 30 US\$/MWh. The O&M cost for proposed project activity is 10.10 US\$/MWh is well within range. The O&M cost has also been compared from the recently registered CDM projects from Indonesia (UN Ref: 5785, 5773), where the O&M cost considered as 10.10 US\$/MWh. However, it is also noted that above projects have a much higher installed capacity i.e. 110 MW and as per study paper “Cost of Geothermal Power and Factors that Affects It” by Subir K Sanyal dated January 2004^{38/}, the O&M cost significantly decreases with installed capacity (as per 2004 cost assumptions per kW project cost for a project with installed capacity 30 MW (18.8 US\$/MWh) was 15.95% higher than project with installed capacity 100 MW (15.8 US\$/MWh). The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit. Based on above discussion, the validation team considers the value used is reasonable and appropriate.</p>
<p>Makeup well cost (in million US\$) 3 wells in 7th year</p>	<p>13.93</p>	<p>The value is sourced from the Feasibility Study Report^{7/}, the same has verified and found consistent.</p>	<p>The validation team has reviewed the study paper “Cost of Geothermal Power and Factors that Affects It” by Subir K Sanyal dated January 2004^{38/}, which mentions the makeup well cost as 35 US\$/MWh and “prospective on economics of geothermal Power” dated 2009^{40/} mentions the makeup well cost as 49 US\$/MWh. The value used for the investment analysis 58.8 US\$/MWh is found to be higher side. Considering the time gap from the study conducted and inflation rate, the value used is considered reasonable. The makeup well cost is also compared with registered CDM projects from Indonesia (UN Ref: 5785, 5773) and value found to be in range. The same is also confirmed by interviewing the technical personnel involved in the proposed</p>



			<p>project activity during site visit^{/22/}.</p> <p>Based on above discussion, the validation team considers the value used is reasonable and appropriate.</p>
Depreciation rate upstream	10%	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	<p>The validation team was able to cross check the value used from host country regulation for Income Tax law no. 36 dated 2008^{/31/}. The value used is found consistent.</p> <p>The validation team was also able to confirm that the value was available to PP at the time of investment decision^{/10/}.</p> <p>Further the depreciation rate has also been compared from the recently registered CDM projects from Indonesia (UN Ref: 5785, 5773), where depreciation rate for upstream is used as 10%.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit^{/22/} and by local expert of the team.</p> <p>Hence the validation team considers the value used as appropriate.</p>
Depreciation rate for downstream	5%	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	<p>The validation team was able to cross check the value used from host country regulation for Income Tax no. 36^{/31/}. The value used is found consistent.</p> <p>The validation team was also able to confirm that the value was available to PP at the time of investment decision^{/10/}.</p> <p>Further the depreciation rate has also been compared from the recently registered CDM projects from Indonesia (UN Ref: 5785, 5773), where depreciation rate for downstream is used as 5%.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit^{/22/} and by local expert of the team.</p> <p>Hence the validation team considers the value used as appropriate.</p>
Fair value	10%	The value is sourced from "Appraising Equipment for Structured Finance Transactions Creating Residual Value Curves to Reflect Physical Depreciation, Obsolescence and Useful Life" By: D. Gregg Dight, ASA dated 16/05/2003 ^{/55/} and found consistent.	<p>The value has been verified from the "Appraising Equipment for Structured Finance Transactions Creating Residual Value Curves to Reflect Physical Depreciation, Obsolescence and Useful Life" By: D. Gregg Dight, ASA dated 16/05/2003^{/55/} and found consistent.</p> <p>The financial expert of the validation team has also confirmed the appropriateness of the 10% fare value for the geothermal power project.</p> <p>Based on above the validation team confirms that the value used is reasonable and appropriate.</p>
Income Tax	34%	Geothermal Tax Law	The value has been verified from the "Presidential Decree 76/2000 (file name:"Tax_Decree of



Rate		2000	<p>President No. 76 Year 2000 article 25.pdf dated 2000^{/30/} and found consistent.</p> <p>Further, the validation team was able confirm that the value used was applicable at the time of decision making and the information was available to PP^{/10/}.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit and by local expert of the team.</p>
Equity	100%	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	<p>The validation team has reviewed the FSR^{/7/} and concludes that the project was conceptualized without considering any debt.</p> <p>The same has been further confirmed by the PP via a letter dated 05/10/2012^{/26/}.</p> <p>The same is also confirmed by interviewing the technical/financial personnel involved in the proposed project activity during site visit^{/22/}.</p> <p>Moreover, based on review of financing pattern of other geothermal project (UN Ref: 5875 & 5773), it can be observed that the above referenced projects were financed by mix financing pattern i.e. debt and equity and owner's equity was about 40%. The above reference projects having installed capacity 110MW, considering the scale of investment, the validation team considers the 100% equity for proposed CDM projects (with installed capacity 31.8MW) is feasible.</p>
Project Life Time (years)	30	The value is sourced from the Feasibility Study Report ^{/7/} , the same has verified and found consistent.	<p>The validation team was able to crosscheck the project life time from the technical specification^{/8/} submitted to PT PLN (PERSERO).</p> <p>Further, 30 years life time of geothermal power plant is also confirmed from study paper "Factors Affecting Costs of Geothermal Power Development" published by Geothermal Energy Association date August 2005 (page no. 39)^{/40/}.</p> <p>The technical expert of the validation team has also confirmed the appropriateness of the 30 years life time for the geothermal power project.</p> <p>The same is also confirmed by interviewing the technical personnel involved in the proposed project activity during site visit.</p> <p>Hence the validation team considers the value used as reasonable and appropriate.</p>

Finding:

CAR#05 CAR#06, CAR#09 & CAR#10, please refer Annex2 of this report, where same is discussed completely.

Sensitivity Analysis:

The PP has carries out the sensitivity analysis on the parameters which are likely to have material impact on project IRR. To check the robustness of calculation the following parameters have been selected

1. Annual electricity output
2. Total investment cost



3. Electricity tariff
4. O&M cost

The validation team confirms that the parameters that have been subjected to the sensitivity is in line with para 20 of the guidelines on the assessment of analysis, annex-5, EB62 Report^{/14/}. The sensitivity analysis covers a reasonable range of +10% and -10%, which is in conformity with para 21 of the guidelines on the assessment of analysis, annex-5, EB62 Report.

The validation team has observed that project cost used for investment analysis i.e. 2773.733 US\$/kW was lower than per MW project cost estimated by study paper^{/41/40/} as 3400 US\$/kW (lower value). Given the inflation rate in host country the project cost is very likely to be escalated at the time of placing purchase order. The range of sensitivity analysis on project cost as $\pm 10\%$ is reasonable.

The electricity tariff used in investment analysis i.e. 90 US\$/MWh is found to be lower than the actual levelised electricity tariff calculated based on payment terms in signed PPA i.e. 97.8 US\$/MWh^{/9/} for proposed project activity. The value used is well within $\pm 10\%$ sensitivity range, moreover, the PPA is signed for 30years and increase in tariff more than 10% is highly unlikely.

The validation team has verified from the literature on geothermal projects and considers that a decrease in value more than 10% than used in investment analysis is not a possibility.

The plant load factor used for investment analysis 90%^{/7/} is estimated based on previous experience of PP and literature also suggest that 90% load factor for geothermal power plant is appropriate and operating at a higher load (i.e. more than 95%) the O&M cost will significantly increase. Considering above the validation considers that an increase in PLF more than 10% is not a likely scenario.

As mentioned above the annual electricity output can be increased by increasing the load factor or by increasing the installed capacity. As installed capacity is fixed and increase in load factor more than 10% is not a likely scenario. Hence validation team considers the $\pm 10\%$ sensitivity range is appropriate.

Based on market trend in and document review, the validation team was able to establish that variation considered is appropriate on identified data/parameter to perform sensitivity analysis.

Input parameter	+10%	Benchmark	-10%	Breaching Value ^{/4/}
Annual electricity output	15.90%	17.91%	--	24.5% increase in annual output
O&M cost	--	17.91%	14.63%	100% decrease in O&M cost
Electricity Tariff	15.90%	17.91%		24.5% increase in electricity tariff
Total investment cost	--	17.91%	15.82%	22.4% decrease in project cost

Opinion:

The validation team confirms that;

- (a) The benchmark is determined based on the information available on official website^{/44/} and using the information published for cost of equity in Appendix of Annex-5 of EB62, the assessment team has validated the values used from the official website and found correct, and considered it to be reasonable to assume that no investment would be made at a rate of return lower than the benchmark.
- (b) It may also be noted that the WACC benchmark value (at the time of investment decision i.e. 12/07/2010^{/10/}) was calculated as 22.74%^{/1/}. However, the benchmark value 17.91% is revised using the default value published in Appendix of Annex-5 of EB62, which is lower than value used in webhosted PDD, which is conservative, hence accepted by the validation team.
- (c) Based on assessment team's local, sectoral and financial expertise, the benchmark (post tax) is considered appropriate for the type of financial indicator (post tax equity IRR) of the project activity.
- (d) It has validated all the input parameters used and the references used are from the verifiable sources and referenced above in the tabular format. The assessment team considers the documents/evidences/references used for investment analysis are appropriate and authentic based on local and technical expertise.



- (e) The input values used to determine the financial indicator of the project are consistent with the FSR and the gap between the finalization of FSR, investment decision and project start date is not significant. This ensures that values remains valid and suitable and any possible variation has been adequately captured under sensitivity analysis.
- (f) The technical and local expertise has evaluated the parameters used in the financial calculations and the assessment team confirms that the underlying assumptions are appropriate and suitable in the context of host country and financial expert confirmed that the financial calculations are correct.
- (g) The IRR (without CDM) is calculated as 14.47%, which is below the benchmark value 17.91%^{/4/} and under reasonable variations on the key input parameters, as selected based on EB 62 Annex 5, the financial indicator continue to remains below the benchmark.
- (h) The project activity is not financially attractive and is therefore found to be additional.

4.8.4 Barrier analysis

Discussion:

PP has demonstrated the additionality using investment analysis. Not applicable

4.8.5 Common practice analysis

Discussion:

PP has considered the entire host country i.e. Indonesia as the geographical boundary for common practice analysis. The PP used the Guidelines on Common practice as per tool for Demonstration and Assessment of additionality, V06.1.0., EB 69, Annex 08^{/13/} to conduct the common practice analysis, which takes a four step approach to establish that the project is a common practice or not as discussed below.

The assessment team carried out a common practice analysis as a credibility check as required by the Additionality Tool and paragraph 128 to 130 of VVS, V02.0^{/18/}.

These steps are validated as follows:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

The applicable output range as +/-50% of the capacity of the proposed project activity comes to 15.9 MW to 47.7 MW taking note of gross installed capacity of 31.8 MW.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step1, as the proposed project activity and have started commercial operation before the start date of the project. PP has chosen the entire country as the geographical area for the purpose of common practice analysis.

The validation team has carried out the assessment based on information published by in "Statistic Book of Electricity and Energy No.24-2011"^{/46/} and available on official website of Directorate General of Electricity (<http://www.djipe.esdm.go.id>), Review of Indonesian geothermal development regulation by Bragus Bramantio dated 06/2012^{/56/} and information available on website of Renewable Energy in Asean for the projects with installed capacity within range of 15.9 MW to 47.7 MW. These documents reveal that there were 15 projects operational¹ before project start date (as it as an earlier event between PSD and date of publication of PDD for GSC). Based on analysis it was found that only 2 projects are in range of installed capacity of the proposed project activity as mentioned below

No	Name	Capacity MW	Commissioning year	Investor during the investment and construction period
0	The proposed project	31.8	2011	
1	Lahendong unit 1	20	2001	PLN
2	Lahendong unit 3	20	2009	PLN

Hence, $N_{all}=2$.

**Step 3: Identify plants that apply technologies different than the technology applied in the proposed project activity**

There are two similar non CDM projects identified, listed in table above which are commissioned prior to start date of the project activity in Indonesia.

The projects listed above are developed and operated by PT PLN (PERSERO), a national electricity company. The study of literature shows that PT PLN has financial support from World Bank and GEF^{/53/} for development of geothermal projects in host country. Moreover, being a state utility has no difficulty in access of capital and clearance. However, the objectives of state sponsored entities, which are even supported by World Bank and GEF can not be equated or compared to the PP of proposed CDM project activity being an IPP.

Based on discussion above, validation team confirms that the similar non-CDM projects identified above are developed in different investment climate and can be categorized as different projects as per para 4 (iv) of Annex-08, EB69.

Thus, $N_{diff} = 2$

Step 4: Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

$$F = 1 - N_{diff}/N_{all} = 1 - 2/2 = 0$$

$F = 0$ is lesser than 0.2 and $N_{all} - N_{diff} = 0$ is less than 3.

Sub step 4b:

Based on discussion above validation team confirms that there are 2 non CDM projects operational in Indonesia, however, they are developed under different investment climate, hence, validation team concludes that no similar projects are operational in Indonesia and proposed project activity is not a common practice.

Findings:

CAR#05 & CAR#10, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The validation team confirms that:

- The geographical scope of the common practice analysis has been validated as the entire host country, considering the technology or industry type to which the project activity belongs, which is in accordance with para 1 of EB69 Annex8 (Guidelines on common practice);
- The existence of similar projects has been described above using publicly available information /46 & 56/ and website <http://www.djipe.esdm.go.id>;
- It has assessed the essential distinctions between the proposed project activity and any similar projects (02) that were observed are described above;
- The proposed project activity is not common practice.

4.9 Application of Monitoring Methodology and Monitoring Plan**Discussion:**

The project activity has applied approved consolidated monitoring methodology ACM0002, V13.0.0^{/20/}. The project activity is geothermal energy based grid connected New power plant with a total installed capacity of 31.8MW, applied monitoring methodology requires the monitoring of net generation electricity supplied to grid by the project plant to grid, quantity of total steam produced in a year and the mass fraction of non-condensable gases (CO₂ and CH₄) in the steam produced. The net generation electricity supplied to grid shall be cross checked with invoice receipt of the buyer.

Further, the monitoring methodology requires calibration of monitoring equipment as per national/local standard applicable and monitored data must be archived in electronic format for crediting period plus two years.



The PDD has described the monitoring plan in a clear and transparent manner, which is in compliance with applied approved consolidated monitoring methodology ACM0002, V13.0.0^{/20/}. The validation team has validated the each parameters required to be monitored as per applied monitoring methodology and in opinion the proposed monitoring plan in PDD is feasible to implement and will result in credible emission reductions due to the project activity.

Parameter determined ex-ante:

The methodology requires identification of the following for grid-connected geothermal power projects:

- a) Data needed to calculate the operating margin emission factor, based on the choice of the method to determine the operating margin (OM), consistent with “Tool to calculate the emission factor for an electricity system”^{/12/};
- b) Data needed to calculate the build margin emission factor consistent with “Tool to calculate the emission factor for an electricity system”^{/12/};

The parameters determined ex-ante for calculating the emission factors are listed in the PDD^{/2/} and were verified by validation team as follows:-

1. Operating Margin (OM) emission factor is 0.769 tCO₂/MWh^{/43/}
2. Build Margin (BM) emission factor (EF_{BM}) is 0.712 tCO₂/MWh^{/43/}
3. Combined Margin (CM) emission factor (EF_{grid,CM,y}) of 0.740 tCO₂/MWh^{/4/}
4. Global warming potential of methane 21 (tCO_{2e}/tCH₄)

The OM and BM are calculated as fixed factors for the first renewable crediting period by choosing data vintage (2008, 2009 and 2010) based on ex-ante data published database^{/43/}. The parameters for determining the GHG emissions reductions have been clearly demonstrated in section B.6.2.of the PDD^{/2/}.

The validation team has verified the above information from the data published by the DNA of Republic of Indonesia^{/43/} and interviewed the officials of DNA and confirms that values used are consistent and reasonable.

Parameters monitored ex-post:

As the project activity is a new geothermal power project and does not involve transfer of energy generating equipment, hence leakage considered as zero is in conformity with the applied approved monitoring methodology ACM0002 V13.0.0^{/20/}.

The following parameters will be monitored ex-post:

- 1) Electricity exported to the grid
- 2) Electricity imported from the grid
- 3) Net electricity supplied to the grid
- 4) Quantity of steam produced during year y (M_{steam,y})
- 5) Average mass fraction of CO₂ in steam produced (W_{steam,CO2,y})
- 6) Average mass fraction of CH₄ in steam produced (W_{steam,Ch4,y})

The monitoring plan consists of monitoring of six parameters representing electricity metering at the evacuation point to the grid. The single line diagram in the section B.7.3 of the PDD^{/2/} also represents the metering locations. The electricity exported, and imported will be directly measured by metering equipment. The electricity (export, import) will be measured continuously by digital kilowatt hour (kWh) meters and recorded monthly. The EG_{facility,y} will be calculated as the net electricity exported to grid less the net electricity imported from the grid. This data will be cross checked against the sales receipt from the grid. The results from the meter will be supplied by the grid company to the developer on a monthly basis.

Further, the PDD has clearly explained the sampling approach to be used for monitoring of the non-condensable gases from produced steam as stipulated in applied approved methodology.

The project activity will install electricity meter of class 0.2s, which is in compliance with the host country requirement for power meter. Every metering system includes the main system and a back-up system. The back-up system will be used in case of failing of the main meter.

As per Decree no.44/M-DAG/PER/12/2011, Clause 3 point 3.b of Trade Ministry (calibration period is 10 years), and as per Decree no.03 dated 2007 on Jamali Grid Code, Article MC.4.1.1 of Energy Ministry (calibration interval is 5 years). However, the PPA mentions the calibration of energy meter to be done each



year. The PDD mentions the calibration frequency as every 1 years^{9/}, which is in line with host country requirement. The calibration procedure is clearly described in the PDD, which is in conformity with the "Guidelines for assessing compliance with the calibration frequency requirements", V01 Annex 60 EB 52 Report^{17/}.

The validation team considers that the monitoring plan has complied with the requirements in the approved methodology.

Data management and QA/QC:

The section B.7.3 of the PDD^{2/} clearly describes the detailed monitoring procedures, monitoring structure, monitoring items, training, calibration procedure and handling of emergency situation, which in conformity with applied methodology. The validation team confirms that the specific uncertainty levels, methods, and associated accuracy level of measurement instruments and calibration procedures used for various parameters and variables are identified in the PDD^{2/}, along with detailed quality assurance and quality control procedures. The accuracy class and the method and frequency of calibration of the electricity meters (conforming to the national standards). Moreover, training plan for the operation and maintenance and CDM monitoring of the project activity has been laid down by the PP, which was verified by validation team.

Based on review of the PDD and interview with relevant stakeholders during site visit, the validation team confirms that the monitoring plan presented in PDD is feasible to implement and will result credible emission reduction calculations.

All data collected will be archived and be kept for at least two years after the end of the last crediting period.

Findings:

CAR#07, please refer Annex-2 of this report, where same is discussed completely.

Opinion:

The validation team confirms that:

- (a) All the values used from official sources and the authenticity of sources has been verified and the validation team and confirms that all relevant parameters to calculate the GHG emissions reductions of the project have been sufficiently considered and the value of the ex-ante fixed parameter used for emission reduction calculation i.e. grid emission factor has been determined conservatively and the estimation ex-post parameters are reasonable. The validation team considers that the monitoring plan has complied with the requirements in the approved methodology thereby satisfying para 132 (a) of VVS, V02.0^{18/}.
- (b) The monitoring plan based on the approved monitoring methodology, ACM0002 V13.0.0^{20/} is included in Section B.7 of the PDD and is correctly applied to the CDM project activity. The monitoring plan has been found to be in compliance with the requirements of the applied methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.
- (c) The validation team considers that monitoring arrangements described in the monitoring plan and feasible within the project design and the PP will be capable to implement the monitoring plan.

4.10 Environmental Impacts

Discussion:

As per Decree no. 8 and 11 year 2006 of Ministry of Environment, an Environmental Impact Assessment (EIA) has to be conducted for electric power development activities in the Exploitation and Development of Geothermal power plants greater than 30 MW in capacity and taken approval by the designated local authority.

In order to assess the environmental impacts that will occur from these geothermal field activities, and to prepare mitigation strategies to address impacts, if any. The PP has prepared the Term of References (ToR) of EIA dated August 16, 2011 (developed by PGE), which was approved by the National EIA Commission (National EIA Commission no. 158 in year 2011)^{24/}.

The PP has provided description of environmental impacts in section D.1 of the PDD. The PP has provided an EIA with mitigation plan and Environmental Management Plan, which comprehensively describes the project activity's impact on Land, Air, Environment, Economy, Social and Ecological impacts. The validation team reviewed the document and concluded that the description provided in PDD is sufficient and consistent



with ANDAL (EMP, EIA mitigation plan). The validation team checked the description for its appropriateness and confirms that the project is not likely to create any adverse environmental effects.

This is compiled by the project activity. As for the environmental impacts due to project activity on the local area, the project proponents submitted a copy of the Environmental Impact Assessment (EIA) report as per in accordance with paragraph 371 of the CDM modalities and procedures, which include potential environmental impacts by the proposed project to the neighboring area and how to minimize the identified impacts. The Validation Team noted that this EIA report had been approved by National EIA Commission dated 23/08/2011^{/24/}.

Findings:

CAR#10, please refer Annex-2 of this report, where same is discussed completely.

Opinion:

An environmental impact assessment (EIA) of the project activity has been conducted as per host country regulation. The Validation Team confirmed that EIA report had been approved by National EIA Commission dated 23/08/2011^{/24/}.

The environment impact of the project activity has been discussed in section D.2 of the PDD. No significant environmental impact is envisaged. Hence the validation team confirms that the project activity complies with the requirements of paragraph 134, 135 of VVS, V02.0^{/18/}.

The proposed project activity contributes to generation of renewable electricity and is expected to benefit the economic development of a backward region. Thus the project activity is expected to have only beneficial impacts and no adverse environmental impacts compared to pre-project situations are foreseen. Social & environmental impacts of the project have been sufficiently addressed. No adverse environmental impacts compared to baseline situation as well as trans-boundary impacts have been envisaged from this project activity.

4.11 Local Stakeholder Comments

Discussion:

The comments by local stakeholders have been invited^{/33/} in an open and transparent manner. A summary of the comments received has been provided to the DOE including, how due account was taken of the comments received. To express their comments and concerns about the project a stakeholder meeting was conducted on 10/05/2012^{/32/} i.e. prior to the publication of the PDD on the UNFCCC website at PGE Kamojang meeting room. The meeting was attended by, Indonesian DNA representative, head of Ibum sub-district, police and military representative, local community leaders, local organizations such as non-governmental, youth and woman participation, and other villagers. The summary of comments, are summarized in Section E.2, and report on how due account was taken of any comments received are provided in Section E.3 of the PDD.

During the site visit conducted on 03/07/2012^{/22/}, the DOE met a section of the stakeholders. The stakeholders were mainly farmers, villagers, government representative and Kamojang unit V personnel. The stakeholders confirmed the stakeholder meet held by the PP and that they had no concerns with respect to the project activity. Stakeholders stated that the project activity helped the village by generating employment opportunities for the local villagers and also improving the infrastructure and transportation modes by making access roads through the hilly terrain.

The validation team noted that all the relevant stakeholders were identified are in line with the definition of stakeholders as per latest version of CDM Glossary of terms.

Findings:

CAR#08, please refer Annex2 of this report, where same is discussed completely.

Opinion:

The validation team have verified the related documents^{/32/33/} and found acceptable and interviewing some of the attendees of the stakeholder meeting during onsite visit on 03/07/2012^{/22/}, which concludes that the project participant conducted the stakeholders' consultation process in transparent and unbiased manner. The validation team was able to conclude that the project activity has not received any adverse comment during stakeholders' consultation process.

The validation team confirms that the process for conducting the local stakeholders meeting is adequate and credible.



4.12 Project design of small-scale CDM project activities

This is a large scale project activity. Not applicable



5. Global Stakeholder Consultation Process

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures and section E of VVS V2, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available..

5.1 Description of how and when the PDD was made publicly available

The Project Design Document for this project was made available on (<http://cdm.unfccc.int/Projects/Validation/DB/ANJO7JKEA511RZI6XBLC57UA8J16WB/view.html>) and was open for comments from 29/05/2012 until 27/06/2012.

5.2 Compilation of all comments received

Comment Number	Date Received	Submitter	Comment
0			No comment received

5.3 Explanation of how comments have been taken into account

Nil



6. References

S. No. Name of document (Validation/Registration Process)

- /1/ Project Design Document, V 1.0, Dated 25/05/2012
- /2/ Project Design Document, V 1.6, Dated 24/10/2012
- /3/ Financial spreadsheet with Emission Reduction Calculation dated 08/06/2012
- /4/ Financial spreadsheet with Emission Reduction Calculation dated 24/10/2012
- /5/
 - Letter of Approval from DNA of Indonesia (Host) Ref: B103/KNMPB/09/2012 dated 18/09/2012
 - Letter of Approval from DNA of Switzerland (Annex-I) Ref: G514-3487 Dated 20/07/2012
- /6/ 6.1 Modalities of Communication (MoC) Dated 04/05/2012
- 6.2 Letter from PT. Pertamina Geothermal Energy confirming the specimen signature and designation of authorised personnel for signing MoC Dated 06/09/2012
- 6.3 Notarised documents confirming the specimen signature and designation of authorised personnel from South Pole Carbon Asset Management Ltd. for signing MoC Dated 22/05/2012
- /7/ Feasibility Study Report (FSR), prepared by PT Pertamina Geothermal Energy Dated 05/2010
- /8/ Technical specification of Kamojang unit V, submitted to PLN
- /9/ Power Purchase Agreement between PT Geothermal Energy and PLN Dated 11/03/2011
- /10/ Investment Decision, Minutes of Meeting of Board of Director of PT. Pertamina Geothermal Energy Dated 12/07/2010
- /11/ Work Order (between PT. Pertamina Geothermal Energy and PT Antareja Resources) to mobilize the equipment for drilling of first well dated 10/01/2011

S. No. Name of document (Background documents used during validation process)

- /12/ Tool to calculate the emission factor for an electricity system, V02.2.1, EB 63, Dated 29/09/2011
- /13/ Tool for the demonstration and assessment of additionality, V6.1.0, EB 68 Dated 13/09/2011
- /14/ Guidelines on the Assessment of Investment Analysis – V05, EB 62, Dated 15/07/2011
- /15/ Guidelines on the demonstration and assessment of prior consideration of the CDM, V04, EB 62 Dated 15/07/2011
- /16/ Guidelines for the reporting and validation of plant load factors, EB48 Annex11
- /17/ Guidelines for assessing compliance with the calibration frequency requirements”, V01, EB 52 Dated 12/02/2010
- /18/ Clean Development Mechanism Validation And Verification Standard, V02.0
- /19/ Glossary of CDM Terms, V06.0
- /20/ ACM0002, V13.0.0, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Dated 11/05/2012
- /21/ CDM Project Cycle Procedure, V2.0
- /22/ Attendance Sheet of site visit Dated 03/07/2012
- /23/ Email from DNA of Indonesia, containing the confirmation on emission factor for Jamali grid Dated 27/06/2012
- /24/ Environmental Impact Assessment (Terms of Reference), approved by EIA approval council, Ministry of Environment Dated 23/08/2011



- /25/ Emission Reduction Purchase Agreement between PT. Pertamina Geothermal Energy and South Pole Carbon Asset Management Ltd. Dated 17/04/2012
- /26/ Letter from PT. Pertamina Geothermal Energy confirming means of finance as 100% owner's equity Dated 05/10/2012
- /27/ Well Drilling Contract between PT. Pertamina Geothermal Energy and PT Antareja Resources Dated 13/12/2010
- /28/ Declaration for non diversion of ODA funding for the project activity by PT. Pertamina Geothermal Energy Dated 02/08/2012
- /29/ Head of Agreement for Development and Utilization of Geothermal Resources between PT. Pertamina Geothermal Energy and PT PLN (PERSERO) Dated 17/02/2010
- /30/ Geothermal Tax Law: Presidential Decree 76/2000 (file name: tax_Decree of President No. 76 Year 2000 article 25.pdf"Dated 2000
Geothermal Tax Law: Presidential Decree 59/2007 (file name:"tax geothermal tax law 59_2007.pdf") Dated 2007
- /31/ Depreciation rate: Income Tax Law -36 Dated 2008
- /32/ Minutes of Meeting of stakeholder consultation process for proposed project activity Dated 10/05/2012
- /33/ Invitation letter for stakeholder consultation process for proposed project activity Dated 04/05/2012
- /34/ Study paper "Geothermal Heat and Power" published by Energy Technology System Analysis Programme Dated May 2010
- /35/ Study paper "Performance of Renewable Energy Plants" by the International Geothermal Association for the World Energy Council Working Group Dated 03/2001
- /36/ Study paper "A guide to geothermal energy and the environment" published by Geothermal Energy Association Dated 22/04/2005
- /37/ Study paper on "Geothermal in Indonesia: Government Regulation and Power Utilities, Opportunities and Challenges of its Development" published in Proceeding World Geothermal Congress 2010, Dated 25-30 April 2010
- /38/ Study paper "Cost of Geothermal Power and Factors that Affects It" by Subir K Sanyal Dated January 2004
- /39/ Study paper "Factors Affecting Costs of Geothermal Power Development" published by Geothermal Energy Association date August 2005
- /40/ Study paper "prospective on economics of geothermal Power" Dated 2009
- /41/ <http://www.eere.energy.gov/geothermal/faqs.html>
- /42/ UNFCCC Web site:
http://unfccc.int/parties_and_observers/parties/items/2352.php
<http://cdm.unfccc.int/Reference/Guidclarif/index.html#meth.>
<http://cdm.unfccc.int/methodologies/PAmethodologies/approved>
<http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>
<http://cdm.unfccc.int/Projects/Validation/DB/ANJO7JKEA511RZI6XBLC57UA8J16WB/view.html>
- /43/ DNA website (Indonesia)
<http://pasarkarbon.dnpi.go.id/web/index.php/dnacdm/read/23/updates-on-emission-factors-of-electricity-interconnection-systems-2011.html>
- /44/ Inflation rate for Indonesia
<http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?pr.x=41>
- /45/ Market Study: Geothermal Sector in Indonesia Potential, Development, and Perspectives Dated 2008



- (http://www.renewablesb2b.com/data/ahk_indonesia/publications/files/Geothermal_Market_Study_B2B.pdf)
- /46/ Statistic book of Electricity and Energy No.24-2011
(<http://www.djpe.esdm.go.id/>)
- /47/ Environmental Impact Analysis Management Plan and Mitigation Plan by PT. Pertamina Geothermal Energy Dated May 2012
- /48/ Forest utilization permit under Forestry Ministerial Decree No. SK-443, Menhut-II/2007 issued by Forest Minister Dated 17/12/2007
- /49/ Water utilization permit by Licensing Service Agency, Jawa-Barat Province Dated 12/01/2011
- /50/ Prior intimation email to DNA (Indonesia) dated 30/08/2010
Prior intimation email to CDM EB dated 16/09/2010 and Revised prior intimation email to CDM EB Dated 12/10/2010
- /51/ Prior consideration CDM form Dated 26/08/2010
- /52/ PPI website
<http://www.bls.gov/ppi/>
- /53/ Indonesia Geothermal Power Generation Development Program by World Bank Dated 02/04/2008
- /54/ Lab test report for average mass fraction of CH₄ and CO₂ in steam produced dated 03/01/2012
- /55/ Appraising Equipment for Structured Finance Transactions Creating Residual Value Curves to Reflect Physical Depreciation, Obsolescence and Useful Life By: D. Gregg Dight, ASA dated 16/05/2003
- /56/ Review of Indonesian geothermal development regulation by Bragus Bramantio dated 06/2012

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Annex 1: Validation Protocol

Table 1 –Validation Requirements for Clean Development Mechanism (CDM) Project Activities (Section E to J, CDM VVS and relevant paragraphs of CDM PCP)

Requirement(s)	Ref	Validation Assessment	Conclusion																
			Draft	Final															
1. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for a minimum of 30 days (45 days for A/R large scale projects), and PDD and comments have been made publicly available	Para 13, 20, 21 of PCP Para 34, 35, 36 of VVS (Section E of VVS)	<p>The PDD is webhosted for the global stakeholder consultation process for the duration 29/05/2012 to 27/06/2012. The same was confirmed by checking the UNFCCC website http://cdm.unfccc.int/Projects/Validation/DB/ANJO7JKEA511RZI6XBLC57UA8J16WB/vjew.html</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>PDD has been made publicly available from 29/05/2012 to 27/06/2012, as required for GSP comments.</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>Comments received</td> <td>No</td> <td>DR</td> </tr> <tr> <td>Comments made publicly available</td> <td>NA</td> <td>DR</td> </tr> <tr> <td>Is there any doubt with regard to authenticity of comments received</td> <td>NA</td> <td>DR</td> </tr> </tbody> </table> <p>No comment received during GSP period.</p>	Validation Criteria	Yes/No	MoV	PDD has been made publicly available from 29/05/2012 to 27/06/2012, as required for GSP comments.	Yes	DR	Comments received	No	DR	Comments made publicly available	NA	DR	Is there any doubt with regard to authenticity of comments received	NA	DR	OK	OK
Validation Criteria	Yes/No	MoV																	
PDD has been made publicly available from 29/05/2012 to 27/06/2012, as required for GSP comments.	Yes	DR																	
Comments received	No	DR																	
Comments made publicly available	NA	DR																	
Is there any doubt with regard to authenticity of comments received	NA	DR																	
2. Approval 2.1 Has the DNA of each Party involved in the proposed CDM project activity in section A.4 of the PDD provided a written letter of approval, which confirms a) The Party is a Party to the Kyoto Protocol b) Participation is Voluntary c) In case of host Party, confirming that the proposed CDM project activity contributes to sustainable development	Para 38 of VVS Para 39 of VVS Para 40	<p>The project activity is a bilateral project and the host party for the project activity is Indonesia, which has ratified Kyoto Protocol on 3rd December, 2004. The same has been checked using http://unfccc.int/parties_and_observers/parties/items/2352.php</p> <p>The Indonesia has nominated National Committee on Clean Development Mechanism as DNA. The same has been confirmed using link below http://cdm.unfccc.int/DNA/index.html</p> <p>Indonesia:</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>The Party is a Party to the Kyoto Protocol</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>Participation is voluntary</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	MoV	The Party is a Party to the Kyoto Protocol	Yes	DR	Participation is voluntary	Yes	DR	CL04	OK						
Validation Criteria	Yes/No	MoV																	
The Party is a Party to the Kyoto Protocol	Yes	DR																	
Participation is voluntary	Yes	DR																	



<p>of the country</p> <p>d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</p> <p>2.2. Whether the letter(s) of approval is unconditional with respect to (a)-(d) above?</p> <p>2.3. The letter(s) of approval has been issued by respective Party's DNA and is valid for the project PA under validation</p>	<p>of VVS Para 41 of VVS (Section F of VVS)</p>	<p>In case of host Party, the proposed PA contributes to the sustainable development of country</p>	Yes	DR																	
		<p>It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</p>	Yes	DR																	
<p>Switzerland:</p> <p>The Annex-I party involved in the project activity is Switzerland, which has ratified Kyoto Protocol on 9th July, 2003. The same has been checked using http://unfccc.int/parties_and_observers/parties/items/2352.php</p> <p>The Switzerland has nominated Federal Office for the Environment FOEN, Climate Division as DNA. The same has been confirmed using link below http://cdm.unfccc.int/DNA/index.html</p>																					
<table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>The Party is a Party to the Kyoto Protocol</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>Participation is voluntary</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>In case of host Party, the proposed PA contributes to the sustainable development of country</td> <td>NA</td> <td>DR</td> </tr> <tr> <td>It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>							Validation Criteria	Yes/No	MoV	The Party is a Party to the Kyoto Protocol	Yes	DR	Participation is voluntary	Yes	DR	In case of host Party, the proposed PA contributes to the sustainable development of country	NA	DR	It refers to the precise proposed CDM project activity title in the PDD being submitted for registration	Yes	DR
Validation Criteria	Yes/No	MoV																			
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<table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>The letter(s) of approval has been received directly from respective DNA</td> <td>No</td> <td>DR</td> </tr> <tr> <td>The authenticity of letter(s) of approval verified with DNA</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>The letter(s) of approval is valid for PA under validation</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>							Validation Criteria	Yes/No	MoV	The letter(s) of approval has been received directly from respective DNA	No	DR	The authenticity of letter(s) of approval verified with DNA	Yes	DR	The letter(s) of approval is valid for PA under validation	Yes	DR			
Validation Criteria	Yes/No	MoV																			
The letter(s) of approval has been received directly from respective DNA	No	DR																			
The authenticity of letter(s) of approval verified with DNA	Yes	DR																			
The letter(s) of approval is valid for PA under validation	Yes	DR																			
<p>The Host Country Approval from the DNA of Indonesia and DNA of Switzerland are submitted to the Validation Team.</p> <p>The PP has provided the</p> <ul style="list-style-type: none"> Letter of approval from DNA of Indonesia (host) Ref: B 103/KNMBP/09/2012 dated 18/09/2012 																					



		<ul style="list-style-type: none"> Letter of approval from DNA of Switzerland Ref: G514-3487 dated 20/07/2012 <p>The validation team confirms after reviewing the LoA from respective DNA that it contains the precise details of project activity and project participant, which is consistent with PDD.</p>														
3. Whether each project participant has been authorized by at least one Party involved in a letter of approval.	Para 45 of VVS (Section G of VVS)	<p>The validation team has reviewed the letter of approval and confirms that all the project participant listed in PDD webhosted for GSP are authorized by at least one party involved in a letter of approval.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>The PPs are listed in tabular form in the PDD and information is consistent with Appendix 1 of PDD</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>No entities other than those authorized as PPs are included in A.4 & Appendix 1 of the PDD.</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>The approval of participation has been issued from the relevant DNA</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	MoV	The PPs are listed in tabular form in the PDD and information is consistent with Appendix 1 of PDD	Yes	DR	No entities other than those authorized as PPs are included in A.4 & Appendix 1 of the PDD.	Yes	DR	The approval of participation has been issued from the relevant DNA	Yes	DR	CL0+	OK
Validation Criteria	Yes/No	MoV														
The PPs are listed in tabular form in the PDD and information is consistent with Appendix 1 of PDD	Yes	DR														
No entities other than those authorized as PPs are included in A.4 & Appendix 1 of the PDD.	Yes	DR														
The approval of participation has been issued from the relevant DNA	Yes	DR														
4. The DNA has considered whether the proposed CDM project activity assists the host Party in achieving sustainable development	Para 50 of VVS (Section H of VVS)	<p>The letter of approval issued by DNA of Indonesia (host) clearly mentions that project activity will contribute to sustainable development in host country.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>The LoA (host Party) confirms the same</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	MoV	The LoA (host Party) confirms the same	Yes	DR								
Validation Criteria	Yes/No	MoV														
The LoA (host Party) confirms the same	Yes	DR														
5. Modalities of communications 5.1 Validation the corporate identity of all project participants and focal points included in the Modalities of Communication (MoC) statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories. 5.2 Validation that the MoC statement has been correctly completed and duly authorized.	Para 53 of VVS (Section I of VVS) Para 59 of VVS	<p>Further, the PT. Pertamina Geothermal Energy has provided the letter dated 06/09/2012 confirming the specimen signature and designation of authorized personnel for signing the MoC. The same has been verified and found the information is consistent and authentic.</p> <p>The South Pole Carbon Asset Management Ltd. has provided notarized document confirming the identity of authorized personnel including the specimen signature and designation. The same has been verified and found authentic and correct.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>Directly checked the evidence for corporate, personal identity and other relevant documentation</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>Notarized documentation; or</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>Written confirmation from PP/CME that submits to it the MoC statement that all corporate and personal</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	MoV	Directly checked the evidence for corporate, personal identity and other relevant documentation	Yes	DR	Notarized documentation; or	Yes	DR	Written confirmation from PP/CME that submits to it the MoC statement that all corporate and personal	Yes	DR	CL0+	OK
Validation Criteria	Yes/No	MoV														
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Notarized documentation; or	Yes	DR														
Written confirmation from PP/CME that submits to it the MoC statement that all corporate and personal	Yes	DR														



		<table border="1"> <tr> <td>details, including specimen signature, are valid and accurate</td> <td></td> <td></td> </tr> <tr> <td>MoC is received from PP/CME (except in the case of Notarized)</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>The authorized capacity(ies) of personnel submitting the MoC or written confirmation is checked</td> <td>Yes</td> <td>DR</td> </tr> </table>	details, including specimen signature, are valid and accurate			MoC is received from PP/CME (except in the case of Notarized)	Yes	DR	The authorized capacity(ies) of personnel submitting the MoC or written confirmation is checked	Yes	DR							
details, including specimen signature, are valid and accurate																		
MoC is received from PP/CME (except in the case of Notarized)	Yes	DR																
The authorized capacity(ies) of personnel submitting the MoC or written confirmation is checked	Yes	DR																
		<p>The MoC is prepared using the latest MoC form available on UNFCCC website and is correctly filled including the annexes.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> <th>MoV</th> </tr> </thead> <tbody> <tr> <td>Latest version of the form 'F-CDM-MOC' is used</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>The information required as per F-CDM-MOC, including its Annex 1, is correctly filled</td> <td>Yes</td> <td>DR</td> </tr> <tr> <td>The signatory in F-CDM-MOC and Annex 1 are same/consistent</td> <td>Yes</td> <td>DR</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	MoV	Latest version of the form 'F-CDM-MOC' is used	Yes	DR	The information required as per F-CDM-MOC, including its Annex 1, is correctly filled	Yes	DR	The signatory in F-CDM-MOC and Annex 1 are same/consistent	Yes	DR				
Validation Criteria	Yes/No	MoV																
Latest version of the form 'F-CDM-MOC' is used	Yes	DR																
The information required as per F-CDM-MOC, including its Annex 1, is correctly filled	Yes	DR																
The signatory in F-CDM-MOC and Annex 1 are same/consistent	Yes	DR																
<p>6. Whether the PDD was completed using the latest version of the PDD form appropriate to the type of project activity.</p>	<p>Para 62 of VVS (Section J of VVS)</p>	<p>The project design document was prepared in accordance with "Guidelines for Completing the Project Design Document", version-01.0, using Project Design Document Form for CDM project activities (F-CDM-PDD), version-04.1, which was the latest version available on UNFCCC site at the time PDD made publically available for Global Stakeholder Consultation process. The same was checked using links below http://cdm.unfccc.int/Reference/PDDs_Forms/index.html#reg</p>		<p>CAR02</p>	<p>OK</p>	<p>OK</p>												
<p>7. Please state the project participants listed in the PDD and check with which of these project participants does KBS have a contract for the projects validation.</p>	<p>Para 15 of PCP</p>	<p>The name of project participants listed in Appendix-I and section A.4 of the published PDD are,</p> <ol style="list-style-type: none"> 1. South Pole Carbon Asset Management Ltd. 2. PT. Pertamina Geothermal Energy <p>South Pole Carbon Asset Management Ltd., has the direct contractual agreement with the DOE i.e. KBS Certification Services Pvt. Ltd.</p> <p>The same was verified with the signed agreement No. CDM.12.VAL.052. dated 25/05/2012</p> <p>Thus it is concluded that one of the project participant listed in the PDD has direct contractual agreement with KBS.</p>		<p>OK</p>	<p>OK</p>	<p>OK</p>												



		Name of the PPs in the PDD (GSP) with which KBS has validation contract				
		Yes/No	MoV			
		South Pole Carbon Asset Management Ltd.	Yes	DR		
		PT. Pertamina Geothermal Energy	No	DR		
7.1. If the project participant(s) listed in the PDD published at international stakeholder consultation are not included in the PDD submitted with request for registration, a letter should be obtained from the withdrawn project participant(s) confirming its voluntary withdrawal from the proposed project activity.	Para 15 of PCP	No inclusion or withdrawal of project participant listed in PDD uploaded for global stakeholder consultation process.			OK	OK
		Name of the PPs in the PDD (RFR) with which KBS has validation contract				
		South Pole Carbon Asset Management Ltd.	Yes	DR		
		PT. Pertamina Geothermal Energy	No	DR		
7.2. Confirm while submitting a request for registration – all of the project participants with a contractual relationship are still listed in the PDD.	Para 15 of PCP	South Pole Carbon Asset Management Ltd. has entered into contractual relationship with KBS and the entity is listed in section A.4 and Appendix-I of the PDD.			OK	OK
7.3. Project participants who are listed in the PDD (submitted for global stakeholder consultation) but who do not have a contractual relationship with KBS for the purposes of the validation activity may be removed from the PDD which is submitted for registration	Para 15 of PCP	No inclusion or withdrawal of project participant listed in PDD uploaded for global stakeholder consultation process.			OK	OK
7.4. KBS may restart the validation activity through the new or revised contract with a different set of project participants by; <ul style="list-style-type: none"> a. Indicating that the first validation contract has been terminated and; b. Republishing the PDD or revised PDD for global stakeholder consultation. 	Para 16 of PCP	Not applicable			NA	NA



Table 2 –Validation Requirements for Clean Development Mechanism (CDM) Project Activities (Section K to N (and section VIII) of CDM VVS and relevant paragraphs of CDM PS)

Checklist Question(s)	Ref	MoV*	Validation Assessment	Conclusion																	
				Draft	Final																
SECTION A. Description of Project Activity																					
A.0. Cover page of PDD																					
A.0.1 Is the cover page of the PDD is correctly and completely filled?	PDD Page 5	/DR/	<p>The cover page of the PDD is filled in accordance with “Guidelines for Completing the Project Design Document”, version-01.0”. The title of the project activity mentioned is “Project Kamojang Unit 5 PT. Pertamina Geothermal Energy”. The uniqueness of the title was verified by checking the same on UNFCCC website i.e. http://cdm.unfccc.int/Projects/Validation/index.html The title of the project activity is unique and its enable reader to uniquely identify and locate the project activity and its content. The version number and the date of the version have been mentioned cover page of the PDD as version: 01 and Date: 25/05/2012</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Title of the project activity</td> <td>Yes</td> </tr> <tr> <td>Version number of the PDD</td> <td>Yes</td> </tr> <tr> <td>Completion date of the PDD</td> <td>Yes</td> </tr> <tr> <td>Project participant(s)</td> <td>Yes</td> </tr> <tr> <td>Host Party(ies)</td> <td>Yes</td> </tr> <tr> <td>Sectoral scope and selected methodology(ies)</td> <td>Yes</td> </tr> <tr> <td>Estimated amount of annual average GHG emission reductions</td> <td>Yes</td> </tr> </tbody> </table> <p>, The date format used to specify the date of completion of the PDD is in line with Guidelines for Completing the Project Design Document. The date format is corrected in final PDD.</p>	Validation Criteria	Yes/No	Title of the project activity	Yes	Version number of the PDD	Yes	Completion date of the PDD	Yes	Project participant(s)	Yes	Host Party(ies)	Yes	Sectoral scope and selected methodology(ies)	Yes	Estimated amount of annual average GHG emission reductions	Yes	CAR02	OK
Validation Criteria	Yes/No																				
Title of the project activity	Yes																				
Version number of the PDD	Yes																				
Completion date of the PDD	Yes																				
Project participant(s)	Yes																				
Host Party(ies)	Yes																				
Sectoral scope and selected methodology(ies)	Yes																				
Estimated amount of annual average GHG emission reductions	Yes																				
A.1. Purpose and general description of the project activity																					



<p>A.1.1 Does the Section A.1 of PDD contains information as required by CDM PS?</p>	<p>Para 31 of PS</p>	<p>/DR/</p>	<p>The proposed project activity is the installation and operation of 30 MW geothermal steam turbine based power plant. The project activity is located in Ibum sub-district, Bandung regency, West Java, Indonesia.</p> <p>Further, the purpose of project activity is to utilize the renewable resources (geothermal energy) to generate electricity and supply it to (Jamali Interconnected grid, thereby replacing the electricity from grid connected power plants which includes fossil fuel based power plants. In absence of the project activity the equivalent power would have been generated from grid mix generation plant, which is dominated by fossil fuel based thermal power plant.</p> <table border="1" data-bbox="877 573 1728 878"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Describe the purpose of the project activity, including a summary of the scope of activities/measures that are to be implemented within the project activity</td> <td>Yes</td> </tr> <tr> <td>Explain how the project activity will reduce GHG emissions or increase GHG removals</td> <td>Yes</td> </tr> <tr> <td>Indicate the sectoral scope(s) and type of the project activity</td> <td>Yes</td> </tr> <tr> <td>Explain the contribution of the project activity to sustainable development</td> <td>Yes</td> </tr> </tbody> </table> <p>The sectoral scope and type of the project activity has been indicated correctly . in final PDD.</p>	Validation Criteria	Yes/No	Describe the purpose of the project activity, including a summary of the scope of activities/measures that are to be implemented within the project activity	Yes	Explain how the project activity will reduce GHG emissions or increase GHG removals	Yes	Indicate the sectoral scope(s) and type of the project activity	Yes	Explain the contribution of the project activity to sustainable development	Yes	<p>CAR02</p>	<p>OK</p>
Validation Criteria	Yes/No														
Describe the purpose of the project activity, including a summary of the scope of activities/measures that are to be implemented within the project activity	Yes														
Explain how the project activity will reduce GHG emissions or increase GHG removals	Yes														
Indicate the sectoral scope(s) and type of the project activity	Yes														
Explain the contribution of the project activity to sustainable development	Yes														
<p>A.1.2 Does the Section A.1 of PDD contains additional information as required and Guidance for completing the PDD Form?</p>	<p>PDD Page 5</p>	<p>/DR/</p>	<p>The PDD mentions that the project activity is a New power project and in absence of the project activity the equivalent power would have been generated from grid mix power plant. The project activity will lead to reduce GHG emission equivalent to 157,946 t CO₂ annually.</p> <table border="1" data-bbox="877 1141 1728 1344"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Scenario existing prior to the implementation of the project activity</td> <td>Yes</td> </tr> <tr> <td>Baseline scenario as identified in Section B.4 of CDM PDD</td> <td>Yes</td> </tr> <tr> <td>Estimate of annual average and total GHG emission reductions for the chosen crediting period</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	Scenario existing prior to the implementation of the project activity	Yes	Baseline scenario as identified in Section B.4 of CDM PDD	Yes	Estimate of annual average and total GHG emission reductions for the chosen crediting period	Yes	<p>CAR02</p>	<p>OK</p>		
Validation Criteria	Yes/No														
Scenario existing prior to the implementation of the project activity	Yes														
Baseline scenario as identified in Section B.4 of CDM PDD	Yes														
Estimate of annual average and total GHG emission reductions for the chosen crediting period	Yes														



			The brief description on baseline scenario identified in section B.4 and technology to be employed was not provided. The baseline scenario is confirmed as per baseline scenario identified in section B.4.								
A.1.3 Is the description of the proposed project activity in the PDD is accurate, complete, and provides an understanding of the proposed CDM project activity?	Para 64-67 of VVS	/DR/ //	In section A.1, the project description is provided in a clear and transparent manner, however, please refer CAR02 raised above. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Validation Criteria</th> <th style="text-align: center;">Yes/No</th> </tr> </thead> <tbody> <tr> <td>Is the proposed CDM project activity at existing facilities or utilizing existing equipments?</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Is the physical site visit undertaken?</td> <td style="text-align: center;">Yes</td> </tr> </tbody> </table> The validation team has conducted a site visit for proposed project activity on 03/07/2012 and confirms that description of proposed project activity in PDD, deemed reasonable, accurate and complete.	Validation Criteria	Yes/No	Is the proposed CDM project activity at existing facilities or utilizing existing equipments?	No	Is the physical site visit undertaken?	Yes	Pending on-site visit	OK
Validation Criteria	Yes/No										
Is the proposed CDM project activity at existing facilities or utilizing existing equipments?	No										
Is the physical site visit undertaken?	Yes										
A.1.4 If the project activity involves the alternation of an existing installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	Para 68 of VVS	/DR/ //	Not applicable as PDD claims that project activity is a New project at site where no power being generated prior to project activity, however, the same need to be verified during site visit and by document review. The same has been confirmed during site visit.	Pending on-site visit	OK						
A.1.5 Is all information provided consistent and in compliance with the actual situation or planning?	Para 69(a) of VVS	/DR/ //	The information provided in PDD version-01, is consistent with planned activity and actual situation observed onsite.	Pending on-site visit	OK						
A.1.6 Is all information with respect to project description deemed accurate and complete?	Para 69(b) of VVS	/DR/ //	Based on site visit observation and document review, validation team concludes that all the information with respect to project description deemed accurate and complete.	OK	OK						
A.1.7 If a physical site visit is not conducted, is it justified appropriately?	Para 69l of VVS	/DR/ //	The validation team has conducted site visit on 03/07/2012.	OK	OK						
A.2. Location of project activity											



A.2.1 Is the host Party(ies) correctly indicated in the PDD?	A.2 of PDD	/DR/	<p>The information regarding the project participants included in section A.4 and appendix-I of the PDD has been checked by the validation team and the both the sections were found to be consistent with each other and filled in the correct format.</p> <p>The table required for indication of project participant is correctly filled as per “Guidelines for Completing the Project Design Document”, version-01.0 EB66, Annex-8.</p>	OK	OK								
A.2.2 Is the Region/State/Province etc., correctly indicated in the PDD?	A.2 of PDD	/DR/	The PDD has correctly identified and indicated the province as West Java Province.	OK	OK								
A.2.3 Is the City/Town/Community etc., correctly indicated in the PDD?	A.2 of PDD	/DR/	The PDD has correctly identified and indicated the city/town as Ibun sub-district, Bandung regency.	OK	OK								
A.2.4 Is the Physical/Geographical location correctly indicated in the PDD?	A.2 of PDD	/DR/	<p>The information on location of the project activity is being provided appropriately, which includes province, city and sub-district including the map , and details found consistent with information provided and on site observation.</p> <p>The geo-coordinates of the project site provided in correct format i.e. decimal points.</p> <table border="1" data-bbox="877 841 1732 1010"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Information allow the unique identification of the proposed project activity i.e., geographical coordinates</td> <td>Yes</td> </tr> <tr> <td>Is map included in the CDM PDD?</td> <td>No</td> </tr> <tr> <td>Is the description of location is limited to one page?</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	Information allow the unique identification of the proposed project activity i.e., geographical coordinates	Yes	Is map included in the CDM PDD?	No	Is the description of location is limited to one page?	Yes	CAR02	OK
Validation Criteria	Yes/No												
Information allow the unique identification of the proposed project activity i.e., geographical coordinates	Yes												
Is map included in the CDM PDD?	No												
Is the description of location is limited to one page?	Yes												
A.3. Technologies and/or measures													
A.3.1 Does the PDD defines the technologies and measures to be employed and/or implemented by the project activity, including a list of the facilities, systems and equipment that will be installed and/or modified by the project activity?	A.3 of PDD	/DR/	<p>The project details are described in project design document (PDD) in a clear and transparent manner. However, the project details against statement made in PDD need to verified during site visit.</p> <table border="1" data-bbox="877 1185 1732 1377"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The age and average lifetime of the equipment defined based on manufacturer’s specifications and industry standards</td> <td>Yes</td> </tr> <tr> <td>Existing and forecast installed capacities, load factors and efficiencies defined</td> <td>Yes</td> </tr> <tr> <td>Monitoring equipments and locations are defined.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The age and average lifetime of the equipment defined based on manufacturer’s specifications and industry standards	Yes	Existing and forecast installed capacities, load factors and efficiencies defined	Yes	Monitoring equipments and locations are defined.	Yes	Pending on-site visit CAR02	OK
Validation Criteria	Yes/No												
The age and average lifetime of the equipment defined based on manufacturer’s specifications and industry standards	Yes												
Existing and forecast installed capacities, load factors and efficiencies defined	Yes												
Monitoring equipments and locations are defined.	Yes												



			<table border="1"> <tr> <td>Energy and mass flows and balances of system and equipments included in the project activity</td> <td>Yes</td> </tr> <tr> <td>Is description complete with regards to as how the same types and levels of services provided by the project activity would have been provided in the baseline scenario</td> <td>Yes</td> </tr> </table> <p>A clear description of all the equipments to be employed and life time of equipments are provided in section A.4 of the PDD, further the energy mass flow and balances of the system and equipments included in the PDD.</p>	Energy and mass flows and balances of system and equipments included in the project activity	Yes	Is description complete with regards to as how the same types and levels of services provided by the project activity would have been provided in the baseline scenario	Yes								
Energy and mass flows and balances of system and equipments included in the project activity	Yes														
Is description complete with regards to as how the same types and levels of services provided by the project activity would have been provided in the baseline scenario	Yes														
A.3.2 Does the PDD contains list of existing equipment and facilities under operations/baseline scenario?	A.3 of PDD	/DR/	<p>The project activity is a New power project and does not involve any alteration of existing installation or process.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity</td> <td>NA</td> </tr> <tr> <td>Facilities, systems and equipment in the baseline scenario, as established in section B.4 of PDD.</td> <td>NA</td> </tr> </tbody> </table> <p>Please refer CAR02. The same has been confirmed during site visit.</p>	Validation Criteria	Yes/No	Facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity	NA	Facilities, systems and equipment in the baseline scenario, as established in section B.4 of PDD.	NA	CAR02	OK				
Validation Criteria	Yes/No														
Facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity	NA														
Facilities, systems and equipment in the baseline scenario, as established in section B.4 of PDD.	NA														
A.3.3 Is the existing scenario prior to the implementation of the project activity same as baseline scenario identified in Section B.4 of PDD?	A.3 of PDD	/DR/	<p>As per baseline scenario identified in section B.4 of the PDD, the scenario existing prior to implementation of the project activity is same as baseline scenario.</p>	OK	OK										
A.3.4 Is the scale and type of the project activity correctly identified?	Para 31 of PS	/DR/	<p>The PDD mentions that the project activity is installation and operation 30MW geothermal steam turbine to generate electricity to Jamali Interconnected grid. The measure equipment to be employed will be imported and PP has experienced to operate the geothermal power project.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Sectoral scope(s) correctly indicated</td> <td>Yes</td> </tr> <tr> <td>Type of project activity correctly indicated</td> <td>NA</td> </tr> <tr> <td>Description on environmentally safe and sound technology(ies) included</td> <td>Yes</td> </tr> <tr> <td>Description on know-how transferred to the host Party, if applicable, included.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	Sectoral scope(s) correctly indicated	Yes	Type of project activity correctly indicated	NA	Description on environmentally safe and sound technology(ies) included	Yes	Description on know-how transferred to the host Party, if applicable, included.	Yes	CAR02	OK
Validation Criteria	Yes/No														
Sectoral scope(s) correctly indicated	Yes														
Type of project activity correctly indicated	NA														
Description on environmentally safe and sound technology(ies) included	Yes														
Description on know-how transferred to the host Party, if applicable, included.	Yes														



			Information has been also provided in PDD on how the technology employed is environmentally safe and sound to operate and type and sectoral scope of the project activity.										
A.4. Party(ies) and project participant(s)													
A.4.1. Is the table required for the indication of Party(ies) and project participant(s) correctly applied?	Para 33 of PS A.4 of PDD	/DR/	The table required for indication of project participant is correctly filled as per "Guidelines for Completing the Project Design Document", version-01.0 EB66, Annex-8.	OK	OK								
A.4.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular Appendix 1)?	A.4 of PDD	/DR/	The information regarding the project participants included in section A.4 and appendix-I of the PDD has been checked by the validation team and the both the sections were found to be consistent with each other and filled in the correct format.	OK	OK								
A.5. Public funding of project activity													
A.5.1. Does the information on public funding provided conform to the actual situation or planning as presented by the project participant(s)?	A.5 of PDD	/DR/	<p>The PP has indicated no use of public funding or ODA from Annex-I countries for the project activity, the same has been confirmed with the supportive provided against the inputs used in financial analysis.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>Does project receives any public funding?</td> <td>No</td> </tr> <tr> <td>Is the funding from Parties included in Annex I to Kyoto Protocol?</td> <td>NA</td> </tr> <tr> <td>If yes, information regarding public funding is provided?</td> <td>NA</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	Does project receives any public funding?	No	Is the funding from Parties included in Annex I to Kyoto Protocol?	NA	If yes, information regarding public funding is provided?	NA	OK	OK
Validation Criteria	Yes/No												
Does project receives any public funding?	No												
Is the funding from Parties included in Annex I to Kyoto Protocol?	NA												
If yes, information regarding public funding is provided?	NA												
A.5.2. Is all information provided consistent with details provided by further chapters of the PDD (in particular Appendix 2)?	A.5 of PDD	/DR/	Information provided in section A.5 of the PDD is consistent with Appendix-2.	OK	OK								
A.5.3 In case of public funding from Annex I Parties, is it confirmed that such funding does not result in a diversion of official development assistance?	Para 34 of PS	/DR/	No public funding involved.	OK	OK								
A.6. Debundling of project activity (section for SSC)													



PAs)													
A.6.1. Is it confirmed that proposed project activity is not a debundled component of large scale project activities?	A.6 of PDD	/DR/	Not applicable	NA	NA								
A.6.2. Is it confirmed that requirements related to Type I projects have been assessed appropriately?		/DR/	Not applicable	NA	NA								
A.6.3. Is it confirmed that requirements related to transport projects have been assessed appropriately?		/DR/	Not applicable	NA	NA								
A.7. Bundling of project activity (section for SSC PAs)													
A.7.1. Is it confirmed that proposed project activity is a bundled project activity?	Para 9 of PDD	/DR/	Not applicable	NA	NA								
SECTION B. Application of selected applied/approved baseline and monitoring methodology													
B.1. Reference of methodology													
B.1.1 Is the reference to the selected methodology consistent with the CDM website?	B.1 of PDD Para 35 of PS	/DR/	The project activity is grid connected geothermal energy based power generation project with total installed capacity 31.8 MW, which is eligible to use the baseline methodology ACM0002. The PDD has correctly identified and applied the approved baseline methodology ACM0002, Version-13.0.0, which was the latest version of applied methodology available at UNFCCC site. The same has been cross checked using link below http://cdm.unfccc.int/methodologies/PAMethodologies/approved	OK	OK								
				<table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The number of the selected methodology is correct</td> <td>Yes</td> </tr> <tr> <td>The title of the selected methodology is correct</td> <td>Yes</td> </tr> <tr> <td>The version of the selected methodology is correct</td> <td>Yes</td> </tr> </tbody> </table>		Validation Criteria	Yes/No	The number of the selected methodology is correct	Yes	The title of the selected methodology is correct	Yes	The version of the selected methodology is correct	Yes
Validation Criteria	Yes/No												
The number of the selected methodology is correct	Yes												
The title of the selected methodology is correct	Yes												
The version of the selected methodology is correct	Yes												



<p>B.1.2 Is the reference to any tools, standards or guidelines as required by the methodology provided?</p>	<p>Para 36 of PS</p>	<p>/DR/</p>	<p>The PDD has applied relevant tools reference by applied methodology and guidelines applicable to project activity available at the time of uploading PDD for global stakeholder comments.</p> <ol style="list-style-type: none"> 1. Tool to calculate emission factor of an electricity system, version-2.2.1 2. Guidelines for assessment of investment analysis, version-05.0 3. Tool for demonstration and assessment of additionality, version-06.0 <p>The tools and guidance used in PDD are latest version available on UNFCCC site at the time of making PDD public for global stakeholder consultation process.</p> <table border="1" data-bbox="879 527 1728 630"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The title of tools/guidelines/standards is correct</td> <td>Yes</td> </tr> <tr> <td>The version of tools/guidelines/standards is correct</td> <td>Yes</td> </tr> </tbody> </table> <p>However, a newer version of tool for demonstration and assessment of additionality was released on UNFCCC site during the validation process, the same has been updated by the PP in final PDD as version-06.1.0.</p>	Validation Criteria	Yes/No	The title of tools/guidelines/standards is correct	Yes	The version of tools/guidelines/standards is correct	Yes	<p>OK</p>	<p>OK</p>		
Validation Criteria	Yes/No												
The title of tools/guidelines/standards is correct	Yes												
The version of tools/guidelines/standards is correct	Yes												
<p>B.1.3 Is the selected methodology and referenced tools/standards/guidances are valid at the time of request for registration?</p>	<p>Para 70-71, 75 VVS</p>	<p>/DR/</p>	<p>The final PDD has applied the latest version of the applied methodology and tool/guidance referenced in methodology. The same has been checked from UNFCCC website.</p> <table border="1" data-bbox="879 863 1728 998"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The selected methodology is valid at request for registration</td> <td>Yes</td> </tr> <tr> <td>The reference tools/guidelines/standards/EB decision are applied correctly</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The selected methodology is valid at request for registration	Yes	The reference tools/guidelines/standards/EB decision are applied correctly	Yes	<p>OK</p>	<p>OK</p>		
Validation Criteria	Yes/No												
The selected methodology is valid at request for registration	Yes												
The reference tools/guidelines/standards/EB decision are applied correctly	Yes												
<p>B.2. Applicability of methodology and/or Project activity eligibility</p>													
<p>B.2.1 Does the PDD contains information as why the selected approved methodology applicable to the project activity?</p>	<p>Para 38 of PS B.2 of PDD</p>	<p>/DR/</p>	<p>The project activity is a new grid connected geothermal energy based power generation project with total installed capacity 31.8 MW (gross installed capacity), which is eligible to use the baseline methodology ACM0002. The PDD has demonstrated the applicability of the project activity with applicability conditions of applied methodology.</p> <table border="1" data-bbox="879 1227 1728 1396"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>All applicability conditions of selected methodology included</td> <td>Yes</td> </tr> <tr> <td>Applicability conditions are consistent with the selected methodology(ies)</td> <td>Yes</td> </tr> <tr> <td>Justification for each applicability conditions is provided</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	All applicability conditions of selected methodology included	Yes	Applicability conditions are consistent with the selected methodology(ies)	Yes	Justification for each applicability conditions is provided	Yes	<p>CAR03</p>	<p>OK</p>
Validation Criteria	Yes/No												
All applicability conditions of selected methodology included	Yes												
Applicability conditions are consistent with the selected methodology(ies)	Yes												
Justification for each applicability conditions is provided	Yes												



			<table border="1"> <tr> <td>All applicability conditions of referred tools/standards/guidelines included</td> <td>Yes</td> </tr> <tr> <td>Applicability conditions are consistent with the referred tools/standards/guidelines</td> <td>Yes</td> </tr> <tr> <td>Justification for each applicability conditions is provided</td> <td>Yes</td> </tr> </table> <p>The applicability of the project activity against all the applicability conditions of the applied approved methodology have been discussed. The justification against each applicability condition is provided in final PDD,</p>	All applicability conditions of referred tools/standards/guidelines included	Yes	Applicability conditions are consistent with the referred tools/standards/guidelines	Yes	Justification for each applicability conditions is provided	Yes				
All applicability conditions of referred tools/standards/guidelines included	Yes												
Applicability conditions are consistent with the referred tools/standards/guidelines	Yes												
Justification for each applicability conditions is provided	Yes												
B.2.2 Is the justification provided in the PDD based correctly quoted and interpreted?	Para 76 of VVS B.2 of PDD	/DR/	<p>The PDD has described the applicability conditions of the applied approved methodology ACM0002, Version-13.0.0 and the project compliance against the requirement therein in a clear and transparent manner.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>Justification against each applicability conditions is critically explained/substantiated in B.2 of PDD</td> <td>Yes</td> </tr> <tr> <td>Is explanation of documentation used consistent with Appendix 3 of PDD, if used</td> <td>Yes</td> </tr> <tr> <td>The information in PDD is compared/cross checked with other sources, if available, using local expertise and sectoral expert</td> <td>Yes</td> </tr> </table>	Validation Criteria	Yes/No	Justification against each applicability conditions is critically explained/substantiated in B.2 of PDD	Yes	Is explanation of documentation used consistent with Appendix 3 of PDD, if used	Yes	The information in PDD is compared/cross checked with other sources, if available, using local expertise and sectoral expert	Yes	CAR03	OK
Validation Criteria	Yes/No												
Justification against each applicability conditions is critically explained/substantiated in B.2 of PDD	Yes												
Is explanation of documentation used consistent with Appendix 3 of PDD, if used	Yes												
The information in PDD is compared/cross checked with other sources, if available, using local expertise and sectoral expert	Yes												
B.2.3 Is the applicability of the selected methodology satisfied/met?	Para 76 of VVS Para 78, 81 of VVS	/DR/	<p>As discussed above the project activity is eligible to use applied approved methodology.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The selected methodology is applicable to project activity</td> <td>Yes</td> </tr> <tr> <td>Is there any deviation from methodology found or applied</td> <td>No</td> </tr> <tr> <td>Is there any clarification that has been sought or applied in the project activity</td> <td>No</td> </tr> </table>	Validation Criteria	Yes/No	The selected methodology is applicable to project activity	Yes	Is there any deviation from methodology found or applied	No	Is there any clarification that has been sought or applied in the project activity	No	CAR03	OK
Validation Criteria	Yes/No												
The selected methodology is applicable to project activity	Yes												
Is there any deviation from methodology found or applied	No												
Is there any clarification that has been sought or applied in the project activity	No												
B.2.4 Is it confirmed that the project activity meets the SSC eligibility requirements?	Para 81 of PS B.2 of PDD Para 150 of VVS	/DR/	Not applicable as project activity is a large scale project.	NA	NA								
B.3. Project boundary													



B.3.1 Does the project boundary include the physical delineation of the proposed CDM project activity?	B.3 of PDD	/DR/	The PDD indicates the sources of GHG gases in baseline scenario and project activity.	Pending on-site visit CAR04	OK	
			Validation Criteria			Yes/No
			The flow diagram of the project boundary included			Yes
			The flow diagram consistent with the information in section A.3 of PDD			Yes
			The flow diagram indicates the GHG sources included in the project boundary			Yes
			The data and parameters to be monitored are indicated			Yes
			The project boundary information consistent with situation observed during physical site visit, if conducted			Yes
Explanation provided on identification of project boundary, also the flow diagram of the project activity, physically delineating the project activity is provided. The justification for sources of GHG gases and flow diagram is provided in final PDD.						
B.3.2 Are all emission sources and gases related to the baseline scenario, project scenario clearly identified and described in project boundary in a complete and transparent manner?	Para 40 of PS B.2 of PDD	/DR/	All the greenhouse gases and their emission sources related to baseline, project scenario and leakage have been identified and described in section B.3 of the PDD, which in compliance with applied approved simplified methodology.	Pending on-site visit	OK	
			Validation Criteria			Yes/No
			The table included for GHG sources included			Yes
			The inclusion/exclusion is justified for GHG sources in the PDD			Yes
The project boundary was verified and confirmed during site visit.						
B.3.3 Is the project boundary consistent with the observations made during site visit.	Para 83, 84 of VVS	/DR/	The project activity is located in West Java, Indonesia and supplies generation electricity to Jamali Interconnected grid of Indonesia. The PDD has correctly identified the project electricity system using the "Tool to calculate emission factor of an electricity system" version 2.2.1.	Pending on-site visit	OK	
			Validation Criteria			Yes/No
			The project boundary is based on objective evidences			Yes
			The project boundary as defined in the PDD is consistent with the observation made during site visit			Yes
			The inclusion/exclusion of the GHG sources is based on objective evidences, wherever possible			Yes
The appropriateness of the project boundary is confirmed during site visit.						



<p>B.3.4. Are there emission sources that will be affected by the implementation of the proposed project activity and which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and are not addressed by the selected approved methodology?</p>	<p>Para 87 of VVS</p>	<p>/DR/</p>	<p>As described in PDD there is no source of GHG emissions occurring within the project boundary as a result of the implementation of the proposed project which are expected to contribute more than 1% of the overall expected average annual ERs. All the machineries and equipments used in the project boundary are to be operated with the renewable sources of energy. However, the same need to be verified during site visit. The same has been confirmed during the site visit and based on the local and sectoral expertise of validation team.</p>	<p>Pending on-site visit</p>	<p>OK</p>						
<p>B.4. Establishment and description of baseline scenario</p>											
<p>B.4.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD follow the steps to determine the baseline scenario required by the methodology/tool and has the application of the tools as per methodology been consulted, if the Tool(s) are required by the methodology?</p>	<p>Para 89 of VVS</p>	<p>/DR/</p>	<p>The applied approved methodology ACM0002 version-13.0 itself has prescribed the most likely baseline scenario for the renewable resource based grid connected New power plant as “the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid”. The PDD has correctly identified the baseline scenario for the project activity, which is in line with applied methodology.</p> <table border="1" data-bbox="869 873 1730 1107"> <thead> <tr> <th data-bbox="869 873 1619 906">Validation Criteria</th> <th data-bbox="1619 873 1730 906">Yes/No</th> </tr> </thead> <tbody> <tr> <td data-bbox="869 906 1619 976">The procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied?</td> <td data-bbox="1619 906 1730 976">Yes</td> </tr> <tr> <td data-bbox="869 976 1619 1107">If the selected methodology requires the use of tools to establish the baseline scenario, the specific guidance in the methodology supersedes the corresponding requirements of the tool.</td> <td data-bbox="1619 976 1730 1107">Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied?	Yes	If the selected methodology requires the use of tools to establish the baseline scenario, the specific guidance in the methodology supersedes the corresponding requirements of the tool.	Yes	<p>OK</p>	<p>OK</p>
Validation Criteria	Yes/No										
The procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied?	Yes										
If the selected methodology requires the use of tools to establish the baseline scenario, the specific guidance in the methodology supersedes the corresponding requirements of the tool.	Yes										



<p>B.4.2. Are all potential realistic and credible alternative scenarios listed in the methodology considered in identification of the most reasonable baseline scenario? Are all scenarios reasonable in the context of the proposed CDM project and no reasonable alternative scenario has been excluded?</p>	<p>Para 90 of VVS</p>	<p>/DR/</p>	<p>The PDD has correctly identified the baseline scenario as stipulated in applied approved methodology ACM0002 version-13.0 and “Tools for demonstration and assessment of additionality”. The scenario identified in section B.5 of the PDD are appropriate and in compliance in context of the project activity.</p> <table border="1" data-bbox="877 407 1728 711"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The alternative scenarios considered by the project participants and any scenarios that are supplementary to those required by the methodology, are realistic and credible in the context of the proposed project activity.</td> <td>Yes</td> </tr> <tr> <td>The identified alternative scenarios are appropriate based on financial expertise, local and sectoral knowledge of the assessment team.</td> <td>Yes</td> </tr> <tr> <td>No alternative scenario has been excluded.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The alternative scenarios considered by the project participants and any scenarios that are supplementary to those required by the methodology, are realistic and credible in the context of the proposed project activity.	Yes	The identified alternative scenarios are appropriate based on financial expertise, local and sectoral knowledge of the assessment team.	Yes	No alternative scenario has been excluded.	Yes	<p>OK</p>	<p>OK</p>
Validation Criteria	Yes/No												
The alternative scenarios considered by the project participants and any scenarios that are supplementary to those required by the methodology, are realistic and credible in the context of the proposed project activity.	Yes												
The identified alternative scenarios are appropriate based on financial expertise, local and sectoral knowledge of the assessment team.	Yes												
No alternative scenario has been excluded.	Yes												
<p>B.4.3 Is there a verifiable description of the baseline scenario? Does this include a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?</p>	<p>Para 91, 92 of VVS</p>	<p>/DR/</p>	<p>The description of baseline scenario is verifiable and in compliance to the applied approved methodology. As the project activity is renewable resource based grid connected power plant, the baseline scenario has been determined following the approved methodology ACM0002 Version 13.0.0 as “ Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the .Tool to calculate the emission factor for an electricity system”</p> <p>The data used for calculating the baseline has been taken from the official report published on Jamali Interconnected Grid by DNA of Indonesia. Hence the baseline for the project activity has been conservatively identified.</p> <table border="1" data-bbox="877 1122 1728 1385"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The information (assumptions, calculations, rationales used in the PDD) used to substantiate the most plausible baseline scenario is quoted and interpreted correctly.</td> <td>Yes</td> </tr> <tr> <td>The information (as mentioned above) has been crosschecked from other sources and/or with local expert.</td> <td>Yes</td> </tr> <tr> <td>The PDD provides a description of the identified baseline scenario, including a description of the technology that would be</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The information (assumptions, calculations, rationales used in the PDD) used to substantiate the most plausible baseline scenario is quoted and interpreted correctly.	Yes	The information (as mentioned above) has been crosschecked from other sources and/or with local expert.	Yes	The PDD provides a description of the identified baseline scenario, including a description of the technology that would be	Yes	<p>OK</p>	<p>OK</p>
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			employed								
B.4.4. Have all applicable CDM requirements been taken into account in the identification of the baseline scenario, including relevant national and/or sectoral policies and circumstances?	Para 93 of VVS	/DR/	<p>The applicable CDM requirements have been taken into account in the identification of the baseline scenario.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>All applicable CDM requirements have been taken into account in the identification of the baseline scenario.</td> <td>Yes</td> </tr> <tr> <td>The relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector have been considered appropriately</td> <td>_Yes</td> </tr> </tbody> </table> <p>The national policies and circumstances discussed in final PDD in context of E+ and E-, based on review of the same validation team concludes that it has no impact.</p>	Validation Criteria	Yes/No	All applicable CDM requirements have been taken into account in the identification of the baseline scenario.	Yes	The relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector have been considered appropriately	_Yes	CAR04	OK
Validation Criteria	Yes/No										
All applicable CDM requirements have been taken into account in the identification of the baseline scenario.	Yes										
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B.5. Additionality											



<p>B.5.1. Does the PDD clearly demonstrated the additionality using the approach as specified in the methodology and by following all the required steps?</p>	<p>B.5 of PDD</p>	<p>/DR/</p>	<p>In section B.5 of the PDD, the additionality of the project activity has been demonstrated as per the tool applied for demonstration and assessment of additionality with reference to applied approved methodology.</p> <table border="1" data-bbox="877 342 1728 1049"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The discussion on additionality is included in the PDD as per the applied methodology and/or tools referred therein</td> <td>Yes</td> </tr> <tr> <td>The compliance and outcome of each required step in the applied methodology and/or tool is indicated in clear and transparent manner in the PDD</td> <td>Yes</td> </tr> <tr> <td>The method selected to demonstrate additionality (e.g. investment analysis or barrier analysis) is indicated.</td> <td>Yes</td> </tr> <tr> <td>All data used (variables, parameters, data sources, etc.), how the additionality of the project activity is demonstrated, is transparently included in the PDD</td> <td>Yes</td> </tr> <tr> <td>If investment analysis is used, list all relevant assumptions and parameters used in the analysis is included.</td> <td>Yes</td> </tr> <tr> <td>The benchmark applied, wherever applied, is clearly indicated.</td> <td>NA</td> </tr> <tr> <td>The credible scenarios compared described where cost comparison is used.</td> <td>NA</td> </tr> <tr> <td>The barriers are substantiated for key facts, assumptions rationale and credibility in demonstrating additionality.</td> <td>NA</td> </tr> <tr> <td>The prior consideration of the CDM in accordance with applicable provisions related to the demonstration of prior consideration of the CDM included.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The discussion on additionality is included in the PDD as per the applied methodology and/or tools referred therein	Yes	The compliance and outcome of each required step in the applied methodology and/or tool is indicated in clear and transparent manner in the PDD	Yes	The method selected to demonstrate additionality (e.g. investment analysis or barrier analysis) is indicated.	Yes	All data used (variables, parameters, data sources, etc.), how the additionality of the project activity is demonstrated, is transparently included in the PDD	Yes	If investment analysis is used, list all relevant assumptions and parameters used in the analysis is included.	Yes	The benchmark applied, wherever applied, is clearly indicated.	NA	The credible scenarios compared described where cost comparison is used.	NA	The barriers are substantiated for key facts, assumptions rationale and credibility in demonstrating additionality.	NA	The prior consideration of the CDM in accordance with applicable provisions related to the demonstration of prior consideration of the CDM included.	Yes	<p>OK</p>	<p>OK</p>
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The prior consideration of the CDM in accordance with applicable provisions related to the demonstration of prior consideration of the CDM included.	Yes																								
<p>B.5.2. Is the discussion on the prior consideration of CDM consistent with the starting date of the project?</p>	<p>Para 105,106 of VVS</p>	<p>/DR/</p>	<p>The start date of the project activity is mention in PDD as 10/01/2011 and the date of notification to CDM EB on 16/09/2010 and DNA on 30/08/2010 which are prior to the start date of project activity The PDD made public for global stakeholder comments on 29/05/2012.</p> <table border="1" data-bbox="877 1247 1728 1377"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The start date of the project activity as indicated in the PDD conforms to the glossary of CDM terms</td> <td>Yes</td> </tr> <tr> <td>The date of publication of the PDD is prior to the start date of</td> <td>No</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The start date of the project activity as indicated in the PDD conforms to the glossary of CDM terms	Yes	The date of publication of the PDD is prior to the start date of	No	<p>OK</p>	<p>OK</p>														
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the project activity															
The start date of the project activity is on or after 2nd August 2008	Yes														
The start date of the project activity is before 2nd August 2008	No														
The prior consideration of CDM is demonstrated as per the requirement	Yes														
B.5.3. Is the start date of the project activity before 2nd Aug 2008 (the start date is prior to the date of publication of the PDD for global stakeholder consultation and new methodology is not proposed) How is the prior consideration of CDM demonstrated?	Para 28 of PS Para 108,109,110 of VVS	/DR/	Not applicable as the start date is after 2 nd August 2008.	OK	OK										
B.5.4. For project activity with a start date on or after 2nd August 2008 (for which the start date is prior to the date of publication of the PDD for global stakeholder consultation and new meth is not proposed) How is the prior consideration of CDM demonstrated?	Para 27 of PS Para 107 of VVS	/DR/	<p>The start date of the project activity is mention in PDD as 10/01/2011 and the date of notification to CDM EB on 16/09/2010 and DNA on 30/08/2010. The PDD made public for global stakeholder comments on 29/05/2012. Based on above discussion the validation team concludes that the CDM was a decisive factor and has been considered by the PP. The same was confirmed from UNFCCC web page link http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The prior consideration of CDM was notified to host Party DNA and UNFCCC as per the applicable form and guidance</td> <td>Yes</td> </tr> <tr> <td>The prior consideration notification has been confirmed from the UNFCCC website</td> <td>Yes</td> </tr> <tr> <td>The communication between PP and DNA and/or UNFCCC in this regard were found satisfactory</td> <td>Yes</td> </tr> <tr> <td>The prior consideration of CDM is demonstrated as per the requirement</td> <td>Yes</td> </tr> </table>	Validation Criteria	Yes/No	The prior consideration of CDM was notified to host Party DNA and UNFCCC as per the applicable form and guidance	Yes	The prior consideration notification has been confirmed from the UNFCCC website	Yes	The communication between PP and DNA and/or UNFCCC in this regard were found satisfactory	Yes	The prior consideration of CDM is demonstrated as per the requirement	Yes	CL05	OK
Validation Criteria	Yes/No														
The prior consideration of CDM was notified to host Party DNA and UNFCCC as per the applicable form and guidance	Yes														
The prior consideration notification has been confirmed from the UNFCCC website	Yes														
The communication between PP and DNA and/or UNFCCC in this regard were found satisfactory	Yes														
The prior consideration of CDM is demonstrated as per the requirement	Yes														



			The validation team has reviewed the well drilling contract dated 13/12/2010, which was a generic framework contract signed for development of geothermal field at Kamojang site and has no obligation on part of PP, hence, couldnot be considered as project start date. Moreover, the PP has revised the date of prior intimation to UNFCCC as 12/10/2010.												
B.5.5. If the baseline scenario is not prescribed in the approved methodology, is it confirmed that the list of identified credible alternatives to the project activity in the PDD selected to determine the most realistic baseline scenario is appropriate?	Para 113, 114 of VVS	/DR/	<p>The applied approved methodology ACM0002 version-13.0 itself has prescribed the most likely baseline scenario for the renewable resource based grid connected New power plant. The PDD has correctly identified the credible alternatives according to the applied approved methodology ACM0002, Version 13.0.0, which are the continuation of the current scenario and the propose project undertaken without CDM. The consistency of the alternatives with the applicable laws and legislation was confirmed by review of the PDD and sectoral expertise of the validation team.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The list of alternatives includes (in PDD) as one of the options that the project activity is undertaken without being registered as a proposed project activity</td> <td>Yes</td> </tr> <tr> <td>The list contains all plausible alternatives based on local and sectoral knowledge of the validation team</td> <td>Yes</td> </tr> <tr> <td>The list contains viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity</td> <td>NA</td> </tr> <tr> <td>The alternatives comply with all applicable and enforced legislation.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The list of alternatives includes (in PDD) as one of the options that the project activity is undertaken without being registered as a proposed project activity	Yes	The list contains all plausible alternatives based on local and sectoral knowledge of the validation team	Yes	The list contains viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity	NA	The alternatives comply with all applicable and enforced legislation.	Yes	OK	OK
Validation Criteria	Yes/No														
The list of alternatives includes (in PDD) as one of the options that the project activity is undertaken without being registered as a proposed project activity	Yes														
The list contains all plausible alternatives based on local and sectoral knowledge of the validation team	Yes														
The list contains viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity	NA														
The alternatives comply with all applicable and enforced legislation.	Yes														
B.5.6. If an investment analysis has been used, has it been demonstrated that the proposed project activity is not the most economically or financially attractive alternative, or is not economically or financially feasible, without the revenue from the sale of CERs.	Para 117, 119 of VVS	/DR/	<p>The PP has performed an investment analysis to demonstrate that the project activity is not a financially attractive alternative. The investment analysis follows a Benchmark analysis approach which is in line with the “Tool for the demonstration and assessment of additionality, version-06.0”. PDD describes that the project activity is not financially attractive than other alternatives available.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The latest version of “Guidelines on the assessment of investment analysis” (EB62 Annex5 Version 5) is applied</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The latest version of “Guidelines on the assessment of investment analysis” (EB62 Annex5 Version 5) is applied	Yes	OK	OK						
Validation Criteria	Yes/No														
The latest version of “Guidelines on the assessment of investment analysis” (EB62 Annex5 Version 5) is applied	Yes														



			<p>The proposed project activity would produce no financial or economic benefits other than CDM-related income.</p> <p>The documented costs associated with the proposed project activity and the alternatives identified demonstrate that there is at least one alternative which is less costly than the proposed project activity (Simple Cost Analysis)</p> <p>The proposed project activity is less economically or financially attractive than at least one other credible and realistic alternative (Investment Comparison Analysis)</p> <p>The financial returns of the proposed project activity would be insufficient to justify the required investment (Benchmark Analysis)</p> <p>The investment analysis approach is appropriate in the context of the project activity.</p> <p>The version of tool for demonstration and assessment of additionality has been updated as version-06.1.0.</p>	No																		
				NA																		
				NA																		
				Yes																		
				Yes																		
B.5.7. Is the investment analysis complete and accurate?	Para 120 of VVS B.2 of PDD		<p>The PP has provided investment analysis spread sheet with the details of calculation of benchmark and return from the project activity.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The project has applied investment analysis</td> <td>Yes</td> </tr> <tr> <td>The financial indicator selected by the PP is suitable in the context of the project activity</td> <td>Yes</td> </tr> <tr> <td>Thorough assessment of all parameters and assumptions used in calculating the financial indicator is conducted</td> <td>Yes</td> </tr> <tr> <td>The parameters have been crosschecked against the third party or publicly available sources</td> <td>Yes</td> </tr> <tr> <td>The FSR, public announcement and annual financial report, as appropriate, have been reviewed with regards to the project activity and participants.</td> <td>Yes</td> </tr> <tr> <td>The correctness of the computation carried out and documented by PP is ensured.</td> <td>Yes</td> </tr> <tr> <td>The sensitivity analysis has been conducted to determine under what conditions variations in result would occur and the likelihood of these conditions.</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The project has applied investment analysis	Yes	The financial indicator selected by the PP is suitable in the context of the project activity	Yes	Thorough assessment of all parameters and assumptions used in calculating the financial indicator is conducted	Yes	The parameters have been crosschecked against the third party or publicly available sources	Yes	The FSR, public announcement and annual financial report, as appropriate, have been reviewed with regards to the project activity and participants.	Yes	The correctness of the computation carried out and documented by PP is ensured.	Yes	The sensitivity analysis has been conducted to determine under what conditions variations in result would occur and the likelihood of these conditions.	Yes		CAR06	OK
Validation Criteria	Yes/No																					
The project has applied investment analysis	Yes																					
The financial indicator selected by the PP is suitable in the context of the project activity	Yes																					
Thorough assessment of all parameters and assumptions used in calculating the financial indicator is conducted	Yes																					
The parameters have been crosschecked against the third party or publicly available sources	Yes																					
The FSR, public announcement and annual financial report, as appropriate, have been reviewed with regards to the project activity and participants.	Yes																					
The correctness of the computation carried out and documented by PP is ensured.	Yes																					
The sensitivity analysis has been conducted to determine under what conditions variations in result would occur and the likelihood of these conditions.	Yes																					



			<p>The financial calculations, parameters, assumptions are as per the relevant and applicable clauses/paragraphs of the latest version of 'Guidelines on the assessment of investment analysis'</p> <p>Based, on final PDD and revised investment analysis spreadsheet, the validation concludes that investment analysis is complete and accurate.</p>	Yes												
B.5.8. If a benchmark is used, is it confirmed that it is suitable in the context of the project activity?	Para 121 of VVS B.5 of PDD EB51 Annex 59 EB40 Para40	/DR/	<p>The project activity has used investment analysis and benchmark. CAR#06 is raised for suitability of the same.</p> <p>The final PDD confirms that the revised benchmark is suitable in the context of project activity.</p>		CAR06	OK										
B.5.9. Does the investment analysis rely on the values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activity?	Para 121 of VVS	/DR/	<p>The PDD has sourced input values from feasibility study report for investment analysis of the project activity. The FSR was prepared in September 2009 and the board decision to proceed with project activity is taken in July 2010, which is less than a year from the date of FSR preparation, hence the validation team considers that it is unlikely that the input values used would have significantly changed.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Validation Criteria</th> <th style="text-align: left;">Yes/No</th> </tr> </thead> <tbody> <tr> <td>The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed</td> <td>Yes</td> </tr> <tr> <td>The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the appropriateness of the values applied is validated as justified</td> <td>Yes</td> </tr> <tr> <td>The input values from the FSR are valid and applicable at the time of investment decision</td> <td>Yes</td> </tr> <tr> <td>The input values have been cross checked, as appropriate, and confirmed by local and sectoral expertise</td> <td>Yes</td> </tr> </tbody> </table> <p>Validation team has independently check the input values used from other</p>	Validation Criteria	Yes/No	The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed	Yes	The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the appropriateness of the values applied is validated as justified	Yes	The input values from the FSR are valid and applicable at the time of investment decision	Yes	The input values have been cross checked, as appropriate, and confirmed by local and sectoral expertise	Yes		CAR06	OK
Validation Criteria	Yes/No															
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The input values from the FSR are valid and applicable at the time of investment decision	Yes															
The input values have been cross checked, as appropriate, and confirmed by local and sectoral expertise	Yes															



			registered project and information available on public domain and confirms that value used are reasonable and appropriate.				
B.5.10. If a barrier analysis has been used, has it been shown that the proposed project activity faces barriers that prevent the implementation of this type of proposed project activity but would not have prevented the implementation of at least one of the alternatives?	Para 124, 125, 126 of VVS	/DR/	The project activity has used investment analysis. Not applied.	NA	NA		
B.5.11. Is the proposed project type be justified as first-of-its kind?	EB 63 Annex 11	/DR/	Not applicable, as the PDD does not claim about the proposed project activity as first of its kind.	NA	OK		
B.5.12. Is the project activity not common practice, unless proposed as first of its kind?	Para 128 of VVS EB 63 Annex 12	/DR/	The PDD claims that there are two project activity implemented prior to start date of the project activity without considering CDM revenue, out of which one project has been developed under different regulatory framework and having different investment climate. The analysis shows that the project activity is not a common practice.	CAR06	OK		
						Validation Criteria	Yes/No
						The common practice has been demonstrated as per approved methodology(ies) and applicable tool(s)	Yes
						The latest guidance on demonstration of common practice is applied including all steps	Yes
						The applicable geographical area is defined appropriately taking note of the country specific or not technology	Yes
						The compliance of Step 4a is confirmed	Yes
						The compliance of Step 4b is confirmed	Yes
						It is confirmed that $N_{all} - N_{diff}$ is not greater than 3	Yes
						It is confirmed that F is not greater than 0.2	Yes
						The value of $N_{all} - N_{diff}$ is greater than 3 and the value of F is greater than 0.2	No
The identification of N_{all} is based on objective evidences and does not include CDM registered and undergoing validation	Yes						



			<p>projects</p> <p>The identification of Ndiff is based on objective evidences and key distinctions have been clearly explained and substantiated</p> <p>The list of activities considered under Nall and Ndiff is complete and verifiable</p> <p>The assessment and result of common practice analysis are confirmed by local and sectoral expertise</p> <p>It is confirmed that project activity is not a common practice and therefore additional</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>												
B.5.13. Is it confirmed that the proposed SSC project activity is additional in accordance with CDM requirements?	Para 158 of VVS	/DR/	The proposed project activity is a large scale project.		NA	NA										
B.6. Emission reductions																
B.6.1.Are the steps and equations (Explanation of methodological choices) applied to calculate emission reductions in compliance with the requirements of selected baseline and monitoring methodology and referred tools?	Para 96 of VVS Section B.6.1 of PDD	/DR/	<p>The PDD has followed the steps specified in applied approved methodology the equations as per approved methodology to calculate the baseline emission and project emission as per applied methodology ACM0002, version-13.0, the project emissions are considered from the emission of non-condensable gases during operation of geothermal power plant.</p> <p>As per applied approved methodology ACM0002 version-13.0, the leakage due to project activity is to be considered if there is transfer of energy generating equipment. The PDD claims leakage as zero, as there is no transfer of energy generating equipment.</p>		CAR06	OK										
			<table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The methods or methodological steps in the selected methodology(ies), for calculating baseline emissions are explained and justified in the PDD</td> <td>Yes</td> </tr> <tr> <td>The methods or methodological steps in the selected methodology(ies), for calculating project emissions are explained and justified in the PDD</td> <td>Yes</td> </tr> <tr> <td>The methods or methodological steps in the selected methodology(ies), for calculating leakages are explained and justified in the PDD</td> <td>Yes</td> </tr> <tr> <td>The equations that will be used in calculating emission</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The methods or methodological steps in the selected methodology(ies), for calculating baseline emissions are explained and justified in the PDD	Yes	The methods or methodological steps in the selected methodology(ies), for calculating project emissions are explained and justified in the PDD	Yes	The methods or methodological steps in the selected methodology(ies), for calculating leakages are explained and justified in the PDD	Yes	The equations that will be used in calculating emission	Yes			
Validation Criteria	Yes/No															
The methods or methodological steps in the selected methodology(ies), for calculating baseline emissions are explained and justified in the PDD	Yes															
The methods or methodological steps in the selected methodology(ies), for calculating project emissions are explained and justified in the PDD	Yes															
The methods or methodological steps in the selected methodology(ies), for calculating leakages are explained and justified in the PDD	Yes															
The equations that will be used in calculating emission	Yes															



			<table border="1"> <tr> <td>reductions are included in the PDD</td> <td></td> </tr> <tr> <td>The methodological choices are explained and justified where methodology prescribes the baseline scenarios</td> <td>Yes</td> </tr> <tr> <td>The methodological choices are explained and justified where methodology provides different options</td> <td>Yes</td> </tr> <tr> <td>The methodological choices are explained and justified where methodology allows different default values</td> <td>NA</td> </tr> <tr> <td>The referred tools by the methodology are applied, explained and choices justified, as appropriate</td> <td>Yes</td> </tr> </table> <p>The equation for project emission in final PDD is corrected and in line with applied methodology. The details of identified electricity system and emission factor calculation incorporated in accordance with applied tool.</p>	reductions are included in the PDD		The methodological choices are explained and justified where methodology prescribes the baseline scenarios	Yes	The methodological choices are explained and justified where methodology provides different options	Yes	The methodological choices are explained and justified where methodology allows different default values	NA	The referred tools by the methodology are applied, explained and choices justified, as appropriate	Yes								
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The methodological choices are explained and justified where methodology prescribes the baseline scenarios	Yes																				
The methodological choices are explained and justified where methodology provides different options	Yes																				
The methodological choices are explained and justified where methodology allows different default values	NA																				
The referred tools by the methodology are applied, explained and choices justified, as appropriate	Yes																				
B.6.2. Are the data and parameters fixed ex ante applied to calculate emission reductions in compliance with the requirements of selected baseline and monitoring methodology and referred tools?	Para 97, 98 of VVS Section B.6.2 of PDD	/DR/	<p>The PDD sourced the value of combined margin emission factor of identified electricity system (Jamali Interconnected grid) from data published by DNA of Indonesia, the values has been verified from the web page link provided in PDD and found correct.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The data and parameters defined ex ante are complete in the context of the project activity</td> <td>Yes</td> </tr> <tr> <td>The data that are calculated using equations provided in the methodology are not included in this section of PDD</td> <td>Yes</td> </tr> <tr> <td>The table for each data and parameter is correctly filled as required by the guidance to fill PDD</td> <td>Yes</td> </tr> <tr> <td>The values applied (single or multiple) of each data is included in a single table, as appropriate</td> <td>Yes</td> </tr> <tr> <td>The choice of data applied is clearly indicated and justified with reference to the source</td> <td>Yes</td> </tr> <tr> <td>The applied value of the data and parameters, as required in some cases e.g. PLF, is as per the applicable guidance issued by CDM EB</td> <td>Yes</td> </tr> <tr> <td>If the data is determined based on measurements methods and procedures, if applicable, the reference to standards used, responsible person/entity that took the measurement, date of</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The data and parameters defined ex ante are complete in the context of the project activity	Yes	The data that are calculated using equations provided in the methodology are not included in this section of PDD	Yes	The table for each data and parameter is correctly filled as required by the guidance to fill PDD	Yes	The values applied (single or multiple) of each data is included in a single table, as appropriate	Yes	The choice of data applied is clearly indicated and justified with reference to the source	Yes	The applied value of the data and parameters, as required in some cases e.g. PLF, is as per the applicable guidance issued by CDM EB	Yes	If the data is determined based on measurements methods and procedures, if applicable, the reference to standards used, responsible person/entity that took the measurement, date of	Yes	CAR06	OK
Validation Criteria	Yes/No																				
The data and parameters defined ex ante are complete in the context of the project activity	Yes																				
The data that are calculated using equations provided in the methodology are not included in this section of PDD	Yes																				
The table for each data and parameter is correctly filled as required by the guidance to fill PDD	Yes																				
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If the data is determined based on measurements methods and procedures, if applicable, the reference to standards used, responsible person/entity that took the measurement, date of	Yes																				



			<p>measurement and measured results are correctly indicated.</p> <table border="1"> <tr> <td>The purpose of data is clearly indicated in the table</td> <td>Yes</td> </tr> <tr> <td>If sampling is allowed by the methodology, it is confirmed that the application is as per the latest version of “Standard for sampling and surveys for CDM PA and PoA”, as appropriate</td> <td>Yes</td> </tr> <tr> <td>The additional information is included in Appendix 4 of PDD</td> <td>No</td> </tr> <tr> <td>The assumptions and sources used are appropriate, correct and would result in either accurate or otherwise conservative estimate of emission reductions</td> <td>Yes</td> </tr> </table> <p>All the parameters considered as ex-ante are mentioned in section B.6.2 of the PDD. Further has sourced the PLF value from FSR,</p>	The purpose of data is clearly indicated in the table	Yes	If sampling is allowed by the methodology, it is confirmed that the application is as per the latest version of “Standard for sampling and surveys for CDM PA and PoA”, as appropriate	Yes	The additional information is included in Appendix 4 of PDD	No	The assumptions and sources used are appropriate, correct and would result in either accurate or otherwise conservative estimate of emission reductions	Yes				
The purpose of data is clearly indicated in the table	Yes														
If sampling is allowed by the methodology, it is confirmed that the application is as per the latest version of “Standard for sampling and surveys for CDM PA and PoA”, as appropriate	Yes														
The additional information is included in Appendix 4 of PDD	No														
The assumptions and sources used are appropriate, correct and would result in either accurate or otherwise conservative estimate of emission reductions	Yes														
B.6.3.Are the steps and equations applied to calculate ex ante calculation of emission reductions in compliance with the requirements of selected baseline and monitoring methodology and referred tools?	Para 97, 98 of VVS Section B.6.3 of PDD	/DR/	<p>The steps equation applied to calculate baseline emission, project emission and leakage are as per applied approved methodology. The PDD has referred combined margin emission factor from the data published by Indonesian DNA on Jamali Interconnected Grid.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The ex ante calculation of emission reductions (BE, PE and LE) is performed transparently in the PDD</td> <td>Yes</td> </tr> <tr> <td>The values applied are consistent with section B.6.2 and B.7.1 for each specific data and/or parameter</td> <td>Yes</td> </tr> <tr> <td>The equations in the applied methodology(ies) and referred tools, as appropriate are correctly applied in reproducible manner in section B.6.3 as sample calculation</td> <td>Yes</td> </tr> <tr> <td>The ex ante calculations are explained in reproducible manner in Appendix 4 and/or electronics spreadsheet</td> <td>Yes</td> </tr> </table> <p>The approach and calculation on emission factor of identified electricity system is provided in PDD and emission reduction spreadsheet. The same has been incorporated in final PDD, based on review of emission factor calculation in office of DNA of Indonesia, the same is found appropriate and correct.</p>	Validation Criteria	Yes/No	The ex ante calculation of emission reductions (BE, PE and LE) is performed transparently in the PDD	Yes	The values applied are consistent with section B.6.2 and B.7.1 for each specific data and/or parameter	Yes	The equations in the applied methodology(ies) and referred tools, as appropriate are correctly applied in reproducible manner in section B.6.3 as sample calculation	Yes	The ex ante calculations are explained in reproducible manner in Appendix 4 and/or electronics spreadsheet	Yes	CAR06	OK
Validation Criteria	Yes/No														
The ex ante calculation of emission reductions (BE, PE and LE) is performed transparently in the PDD	Yes														
The values applied are consistent with section B.6.2 and B.7.1 for each specific data and/or parameter	Yes														
The equations in the applied methodology(ies) and referred tools, as appropriate are correctly applied in reproducible manner in section B.6.3 as sample calculation	Yes														
The ex ante calculations are explained in reproducible manner in Appendix 4 and/or electronics spreadsheet	Yes														



B.6.4. Is the table to indicate the emission reductions over the crediting period included and correct?	Section B.6.4 of PDD	/DR/	The PDD correctly filled the table to indicate the emission reduction over selected crediting period. The values of annual emission reductions are consistent with other sections of the PDD.	OK	OK	
			Validation Criteria			Yes/No
			The table is completely and correctly filled			Yes
			The emission reductions (BE, PE, LE) are consistent with the other places in the PDD (B.6.3, Appendix 4 etc.)			Yes
			The information in this section is consistent with other sections (e.g. crediting period etc.)	Yes		
B.6.5. Are all the steps taken and equations applied to calculate project emissions, baseline emissions and leakage and emission reductions correct and appropriate?	Para 99 of VVS	/DR/	The steps equation applied to calculate baseline emission, project emission and leakage are as per applied approved methodology. The PDD has referred combined margin emission factor from the data published by Indonesian DNA on Jamali Interconnected Grid.	CAR06	OK	
			Validation Criteria			Yes/No
			All assumptions and data used by the project participants are listed in the PDD, including their references and sources			Yes
			All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD			Yes
			All values used in the PDD are considered reasonable in the context of the proposed CDM project activity			Yes
			The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions			Yes
			All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD			Yes
			The spreadsheet provided is transparent, unprotected and reproducible			Yes
B.7. Monitoring plan						
B.7.1.1. Does the monitoring plan of the PDD comply with the approved methodology(ies)and applicable tool(s)?	Para 132(a) of VVS	/DR/	The monitoring plan in the PDD is in compliance with the applied approved monitoring methodology and it contains the necessary parameter as per applied methodology and tool to calculate emission factor of an electricity system for estimation of emission reduction within project boundary.	Pending on-site visit CAR07	OK	
			Validation Criteria			Yes/No



			<table border="1"> <tr> <td>The list of parameters included in the section B.7.1 of the PDD is complete in the context of the project activity with respect to the applied methodology(ies) and applicable tool(s)</td> <td>Yes</td> </tr> <tr> <td>The description of monitoring plan for each monitored parameter is complies with the requirements of the approved methodology(ies) and applicable tool(s)</td> <td>Yes</td> </tr> <tr> <td>The table is filled correctly and completely for each parameter to be monitored specifying source and applied value</td> <td>Yes</td> </tr> <tr> <td>The table specifies the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals</td> <td>Yes</td> </tr> <tr> <td>The QA/QC procedures (calibration procedures and frequency) and purpose of data as required by the approved methodology(ies) and applicable tool(s) are correctly indicated</td> <td>Yes</td> </tr> <tr> <td>The information in this regard is consistent with Appendix 5 and emission reduction spreadsheet</td> <td>NA</td> </tr> </table> <p>The parameters, operating margin emission factor and build margin emission factor, used to calculate combined margin emission factor of identified electricity system are provided in section B.6.2 of the PDD.</p> <p>The monitoring equipments have to be calibrated in a defined frequency i.e. at least once in three year from the third party as per the requirement of monitoring plan. The frequency of calibration of energy/steam equipment is provided in PDD.</p>	The list of parameters included in the section B.7.1 of the PDD is complete in the context of the project activity with respect to the applied methodology(ies) and applicable tool(s)	Yes	The description of monitoring plan for each monitored parameter is complies with the requirements of the approved methodology(ies) and applicable tool(s)	Yes	The table is filled correctly and completely for each parameter to be monitored specifying source and applied value	Yes	The table specifies the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals	Yes	The QA/QC procedures (calibration procedures and frequency) and purpose of data as required by the approved methodology(ies) and applicable tool(s) are correctly indicated	Yes	The information in this regard is consistent with Appendix 5 and emission reduction spreadsheet	NA			
The list of parameters included in the section B.7.1 of the PDD is complete in the context of the project activity with respect to the applied methodology(ies) and applicable tool(s)	Yes																	
The description of monitoring plan for each monitored parameter is complies with the requirements of the approved methodology(ies) and applicable tool(s)	Yes																	
The table is filled correctly and completely for each parameter to be monitored specifying source and applied value	Yes																	
The table specifies the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals	Yes																	
The QA/QC procedures (calibration procedures and frequency) and purpose of data as required by the approved methodology(ies) and applicable tool(s) are correctly indicated	Yes																	
The information in this regard is consistent with Appendix 5 and emission reduction spreadsheet	NA																	
B.7.1.2. Is the description of the monitoring plan (implementation) feasible in the context of the project activity?	Para 132(b) of VVS	/DR/	<p>The proposed monitoring plan in the PDD is feasible to be implemented and in compliance with applied approved methodology. The validation team has reviewed the monitoring plan presented in PDD and the detailed procedure for monitoring and calibration of equipments and concludes that proposed plan is feasible to implement.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The monitoring plan described in the PDD is feasible within the project design</td> <td>Yes</td> </tr> <tr> <td>The information in the monitoring plan, in this regard, is confirmed based on the documented procedures, interview,</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The monitoring plan described in the PDD is feasible within the project design	Yes	The information in the monitoring plan, in this regard, is confirmed based on the documented procedures, interview,	Yes	Pending on-site visit	OK							
Validation Criteria	Yes/No																	
The monitoring plan described in the PDD is feasible within the project design	Yes																	
The information in the monitoring plan, in this regard, is confirmed based on the documented procedures, interview,	Yes																	



			<p>project plan and physical inspection during site visit, as appropriate</p> <table border="1"> <tr> <td>The QA/QC procedures as included in the PDD are sufficient to determine the ex post emission reductions and be verified</td> <td>Yes</td> </tr> </table> <p>The same has been confirmed during site visit.</p>	The QA/QC procedures as included in the PDD are sufficient to determine the ex post emission reductions and be verified	Yes										
The QA/QC procedures as included in the PDD are sufficient to determine the ex post emission reductions and be verified	Yes														
B.7.2 Is there any sampling approach applied for any parameter to be monitored?	Section B.7.2 of PDD	/DR/	<p>The PDD indicates that mass fraction of non-condensate gases will be measured by applying sampling approach as stipulated in applied approved methodology.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The sampling approach is applied for some monitored parameters</td> <td>Yes</td> </tr> <tr> <td>The sampling approach is allowed by the applied methodology(ies) or applicable tool(s)</td> <td>Yes</td> </tr> <tr> <td>The sampling is clearly defined in Section B.7.2 of the PDD</td> <td>Yes</td> </tr> <tr> <td>The sampling approach confirms to "Standard for sampling and surveys for CDM project activities and programme of activities"</td> <td>Yes</td> </tr> </tbody> </table> <p>The sampling approach w.r.t steam sampling have been discussed in final PDD as per standard stipulated in applied approved methodology ACM0002.</p>	Validation Criteria	Yes/No	The sampling approach is applied for some monitored parameters	Yes	The sampling approach is allowed by the applied methodology(ies) or applicable tool(s)	Yes	The sampling is clearly defined in Section B.7.2 of the PDD	Yes	The sampling approach confirms to "Standard for sampling and surveys for CDM project activities and programme of activities"	Yes	CAR07	OK
Validation Criteria	Yes/No														
The sampling approach is applied for some monitored parameters	Yes														
The sampling approach is allowed by the applied methodology(ies) or applicable tool(s)	Yes														
The sampling is clearly defined in Section B.7.2 of the PDD	Yes														
The sampling approach confirms to "Standard for sampling and surveys for CDM project activities and programme of activities"	Yes														
B.7.3. Are the other elements of the monitoring plan completely defined?	Para 56 of PS Section B.7.3 of PDD	/DR/	<p>The proposed monitoring plan in section B.7 of the PDD clearly indicates the procedure for collection and archiving of all relevant data necessary for estimation of emission reduction within project boundary during crediting period, which are in compliance with applied approved monitoring methodology. All the parameter included in monitoring plan are feasible to monitor and will lead to real and credible emission reduction calculation. The information regarding the each monitoring variable is sufficient to ensure the verification of a proper implementation of the monitoring plan.</p> <p>The local /sectoral expert has also confirmed the reliability of the monitoring plan in accordance with applied monitoring methodology.</p> <table border="1"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The operational and management structure (authority and responsibility for registration, monitoring, measurement and reporting) to be put in place to implement the monitoring plan is included</td> <td>Yes</td> </tr> <tr> <td>The provisions included in PDD to ensure that data monitored</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The operational and management structure (authority and responsibility for registration, monitoring, measurement and reporting) to be put in place to implement the monitoring plan is included	Yes	The provisions included in PDD to ensure that data monitored	Yes	OK	OK				
Validation Criteria	Yes/No														
The operational and management structure (authority and responsibility for registration, monitoring, measurement and reporting) to be put in place to implement the monitoring plan is included	Yes														
The provisions included in PDD to ensure that data monitored	Yes														



			required for verification and issuance be kept and archived electronically for 2 years after the end of crediting period or the last issuance of CERs, whichever occur later			
			The definitions of responsibilities and institutional arrangements for data collection and archiving included in the PDD	Yes		
			QA/QC procedures are defined clearly	Yes		
			The uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables are included.	Yes		
			The information in this regard is consistent with the other sections of the PDD viz., Appendix 5	NA		
			The project participant will be able to implement the described monitoring plan	Yes		
SECTION C. Duration and crediting period						
C.1.1. Is the start date of the project activity and operational lifetime clearly defined and reasonable?	Para 57, 58 of PS C.1 of PDD	/DR/	According to the CDM glossary of terms, the starting date of a project activity is the earliest date of either the implementation or construction or real action of a project activity begins. The start date of the project activity indicated in PDD as 10/01/2011, which is the date of equipment mobilization of the first well drilling. And the operational life time is mentioned as 30 years, the same has been checked from FSR.		CAR05	OK
			Validation Criteria	Yes/No		
			The start date of project activity is correctly included in the PDD in DD/MM/YYYY format	Yes		
			The evidence to support start date of project activity is included in the PDD	Yes		
			The start date of project activity is as per the glossary of CDM and confirms the observations made during site visit	Yes		
			The operational lifetime of the project activity is correctly included in the PDD	Yes		
			The operational lifetime is in accordance with EB50 Annex15 or from other sources as appropriate.	Yes		



<p>C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?</p>	<p>C.2 of PDD</p>	<p>/DR/</p>	<p>PP has opted the 7 years renewable crediting period for the proposed project activity, the start of the crediting period envisaged for the proposed project activity has been assessed by the validation team to be realistic, taking into consideration the time needed for validation. PDD claims the operational life time of the project activity as 30 years in contrast to the 7 years renewable crediting period. Therefore the operational life time of the project activity doesn't exceed the crediting period.</p> <table border="1" data-bbox="877 475 1728 743"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The type of crediting period is correctly included in the PDD</td> <td>Yes</td> </tr> <tr> <td>The start date of crediting period is correctly included in the PDD in DD/MM/YYYY format based on expected commissioning of the project activity but is not earlier than the expected date of registration</td> <td>Yes</td> </tr> <tr> <td>The length of crediting period is correctly included in PDD as per the type of credit period chosen</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The type of crediting period is correctly included in the PDD	Yes	The start date of crediting period is correctly included in the PDD in DD/MM/YYYY format based on expected commissioning of the project activity but is not earlier than the expected date of registration	Yes	The length of crediting period is correctly included in PDD as per the type of credit period chosen	Yes	<p>OK</p>	<p>OK</p>
Validation Criteria	Yes/No												
The type of crediting period is correctly included in the PDD	Yes												
The start date of crediting period is correctly included in the PDD in DD/MM/YYYY format based on expected commissioning of the project activity but is not earlier than the expected date of registration	Yes												
The length of crediting period is correctly included in PDD as per the type of credit period chosen	Yes												
<p>SECTION D. Environmental impacts</p>													
<p>D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?</p>	<p>D.1 of PDD Para 63 of PS</p>	<p>/DR/</p>	<p>The PDD clearly explains the outcome of the Environmental Impact Analysis report.</p> <table border="1" data-bbox="877 854 1728 1057"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>An analysis of environmental impacts of the project activity carried out by project participant(s)</td> <td>Yes</td> </tr> <tr> <td>Analysis of such impacts is included in the PDD, including any trans-boundary impacts, if applicable</td> <td>Yes</td> </tr> <tr> <td>The reference is given to the related documentation in PDD</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	An analysis of environmental impacts of the project activity carried out by project participant(s)	Yes	Analysis of such impacts is included in the PDD, including any trans-boundary impacts, if applicable	Yes	The reference is given to the related documentation in PDD	Yes	<p>OK</p>	<p>OK</p>
Validation Criteria	Yes/No												
An analysis of environmental impacts of the project activity carried out by project participant(s)	Yes												
Analysis of such impacts is included in the PDD, including any trans-boundary impacts, if applicable	Yes												
The reference is given to the related documentation in PDD	Yes												
<p>D.1.2. Are there any host Party requirements for an Environmental Impact Assessment (EIA)?</p>	<p>D.2 of PDD Para 64 of PS Para 134, 135 of VVS</p>	<p>/DR/</p>	<p>As per host country regulation, Environmental Ministry Decree no. 8 and 11 year 2006, an Environmental Impact Assessment (EIA) has to be conducted for electric power development activities in the Exploitation and Development of Geothermal power plants greater than 30 MW in capacity, in order to assess the environmental impacts that will occur from these geothermal field activities, and to prepare mitigation strategies to address impacts, if any.</p> <table border="1" data-bbox="877 1255 1728 1388"> <thead> <tr> <th>Validation Criteria</th> <th>Yes/No</th> </tr> </thead> <tbody> <tr> <td>The environmental impacts are considered significant</td> <td>Yes</td> </tr> <tr> <td>If environmental impacts are considered significant by PP or host Party, has an EIA been conducted</td> <td>Yes</td> </tr> </tbody> </table>	Validation Criteria	Yes/No	The environmental impacts are considered significant	Yes	If environmental impacts are considered significant by PP or host Party, has an EIA been conducted	Yes	<p>OK</p>	<p>OK</p>		
Validation Criteria	Yes/No												
The environmental impacts are considered significant	Yes												
If environmental impacts are considered significant by PP or host Party, has an EIA been conducted	Yes												



			<table border="1"> <tr> <td>Is there any host Party requirements for EIA for project activity</td> <td>Yes</td> </tr> <tr> <td>Is the EIA conducted in accordance with such procedures</td> <td>Yes</td> </tr> <tr> <td>The reference is given to the related documentation in PDD</td> <td>Yes</td> </tr> </table> <p>The EIA report has been approved by concerned authority and the same has been confirmed from the documentary evidence provided by PP.</p>	Is there any host Party requirements for EIA for project activity	Yes	Is the EIA conducted in accordance with such procedures	Yes	The reference is given to the related documentation in PDD	Yes				
Is there any host Party requirements for EIA for project activity	Yes												
Is the EIA conducted in accordance with such procedures	Yes												
The reference is given to the related documentation in PDD	Yes												
SECTION E. Local stakeholder consultation													
E.1.1. Have local stakeholders been invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC web	Para 69 of PS	/DR/	<p>The local stakeholder meeting was conducted on 10/05/2012 at project sites, which was prior to web hosting of the PDD 29/05/2012.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The local stakeholder consultation process is done prior to webhosting of the PDD for GSP</td> <td>Yes</td> </tr> </table>	Validation Criteria	Yes/No	The local stakeholder consultation process is done prior to webhosting of the PDD for GSP	Yes	OK	OK				
Validation Criteria	Yes/No												
The local stakeholder consultation process is done prior to webhosting of the PDD for GSP	Yes												
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	Para 65, 66 of PS	/DR/	<table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The local stakeholders were identified appropriately</td> <td>Yes</td> </tr> <tr> <td>The local stakeholders were invited in reasonable time</td> <td>Yes</td> </tr> <tr> <td>The local stakeholders were invited using appropriate medium</td> <td>Yes</td> </tr> </table> <p>The details of stakeholder consultation process is incorporated in final PDD, the same has been found consistent with supportive provided. The stakeholder invitation letter 04/05/2012 have been provided to validation team, which is found appropriate.</p>	Validation Criteria	Yes/No	The local stakeholders were identified appropriately	Yes	The local stakeholders were invited in reasonable time	Yes	The local stakeholders were invited using appropriate medium	Yes	CAR08	OK
Validation Criteria	Yes/No												
The local stakeholders were identified appropriately	Yes												
The local stakeholders were invited in reasonable time	Yes												
The local stakeholders were invited using appropriate medium	Yes												
E.1.3. Is the undertaken stakeholder process described in a complete and transparent manner?	Para 67, 68 of PS 139 of VVS	/DR/	<p>The PDD has clearly explained the details on the proceeding of local stakeholder consultation process. The summary of stakeholders comment is provided in section E.2 of the PDD.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The local stakeholders were informed appropriately about the project activity to comment</td> <td>Yes</td> </tr> <tr> <td>Summary of comments as included in the PDD is complete</td> <td>Yes</td> </tr> </table>	Validation Criteria	Yes/No	The local stakeholders were informed appropriately about the project activity to comment	Yes	Summary of comments as included in the PDD is complete	Yes	OK	OK		
Validation Criteria	Yes/No												
The local stakeholders were informed appropriately about the project activity to comment	Yes												
Summary of comments as included in the PDD is complete	Yes												
E.1.4. Has due account been taken of any stakeholder comments received?	Para 139, 140 of VVS E of PDD	/DR/	<p>The PDD describes the management action towards concern raised by stakeholders, the same has also been verified from the MoM.</p> <table border="1"> <tr> <td>Validation Criteria</td> <td>Yes/No</td> </tr> <tr> <td>The comments received from local stakeholders have been considered for due account</td> <td>Yes</td> </tr> <tr> <td>The due account taken of all comments is adequate</td> <td>Yes</td> </tr> </table>	Validation Criteria	Yes/No	The comments received from local stakeholders have been considered for due account	Yes	The due account taken of all comments is adequate	Yes	OK	OK		
Validation Criteria	Yes/No												
The comments received from local stakeholders have been considered for due account	Yes												
The due account taken of all comments is adequate	Yes												



			The information contained in PDD with regard to local stakeholder consultation is adequate.	Yes		
SECTION F. Approval and authorization						
F.1.1 Has the approval and authorization is indicated correctly?	Para 70, 71 of PS F of PDD	/DR/	The PDD has correctly indicated the details in section F of the PDD. Validation Criteria The letter of approval at GSP of PDD is available The information in this regard is included in the PDD The letter of approval(s) at Request for Registration is available from all identified Parties in the PDD Please refer CL01.	Yes/No No Yes Yes	CL01	OK



Annex 2: Detailed Findings

Nature of findings:

	CARs	CLs	FARs
Total Number raised	08	02	00

Date	Type & Number	Raised by	Reference
04/06/2012	CL 01	Assessment Team	Annex-I, D-32
Non conformities raised			
a) The letter of approval from respective DNAs for proposed project activity is not provided (refer para 38 of VVS 02).			
b) MoC has not been submitted to the DOE. (refer para 53 of VVS 02).			
Project Participant's response		Date: 25/06/2012	
a. LoA is expected to be submitted by July			
b. MoC is expected to be submitted by July			
Documentation Provided as Evidence by Project Participant			
NA			
Reasoning for not acceptance or close out		Date of review: 04/07/2012	
The LoA from respective DNA not submitted.			
Project Participant's response		Date: 15/08/2012	
a. LoA host country is expected to be submitted by early August			
b. MoC is expected to be submitted by late August			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.3			
Kamojang LoA Annex-1 country.pdf			
Reasoning for not acceptance or close out		Date of review: 27/09/2012	
a) The LoA from DNA of Annex-I country i.e. Switzerland is submitted to validation team. The LoA dated 20/07/2012 (ref: G514-3487) is clearly mentions the project title and name of the project participant as per webhosted PDD. The letter of approval from host country (Indonesia) DNA dated 18/09/2012 reference no. B 103/KNMPB/09/2012 is provided to validation team. The same has reviewed and found that project title and the name of project participant is consistent in LoA and PDD. The authenticity was also confirmed by reviewing other LoA issued by the DNA of Indonesia.			
b) The MoC was not provided. Open			
Project Participant's response		Date: 04/10/2012	
Fully signed MoC is being submitted.			
Documentation Provided as Evidence by Project Participant			
MoC signed by PT. Pertamina Geothermal Energy and South Pole Carbon Asset Management Ltd. dated 04/05/2012			
Letter confirming the specimen signature and designation of authorized personnel to sign MoC from PT. Pertamina Geothermal Energy dated 06/09/2012			
Copy of certificate issued by Notariat Aussersihl-Zurich confirming the specimen signature and designation of authorized personnel to sign MoC dated 22/05/2012			
Reasoning for not acceptance or close out		Date of review: 08/10/2012	
The validation team has reviewed the MoC and established that MoC is correctly filled using latest version of the MoC form including annexes.			
Further, the specimen signature and name of the authorized personnel found correct and authentic.			



Date of acceptance or non-acceptance	Date: 08/10/2012	Status: Closed	
Date	Type & Number	Raised by	Reference
04/06/2012	CAR 02	Assessment Team	Annex-I, D-32
Non conformities raised			
<ul style="list-style-type: none"> a) The appendix-4, 5 and 6 of project design document template are missing (refer para 62&63 of VVS02) b) Date format used to indicate the PDD completion date on cover page is not in line with Guidelines For Completing The Project Design Document Form, version-01, annex-8 of EB66 Report c) The brief description of baseline scenario is not provided in section A.1 of the PDD, which is not in line with Guidelines For Completing The Project Design Document Form, version-01, annex-8 of EB66 Report (refer para 69(b) of VVS 02) d) The sectoral scope and category of the project activity is not mentioned in section A.1 and A.4 of the PDD (please refer para 31 of PS) e) The physical map of the location of the project site is not provided in section A.2.4 of the PDD, which is not in line with Guidelines For Completing The Project Design Document Form, version-01, annex-8 of EB66 Report f) In section A.4 of the PDD, clear description of all the equipments to be employed and life time of equipments are not provided, further the energy mass flow and balances of the system and equipments included in the project activity is not provided. Also the brief description on baseline as identified in section B.4 is not provided, which is not in line with Guidelines for Completing the Project Design Document Form, version-01, annex-8 of EB66 Report. 			
Project Participant's response		Date: 25/06/2012	
<ul style="list-style-type: none"> a. Appendix 4, 5 and 6 of PDD template is included b. Date format is now in line with EB99 Annex 8 c. Baseline scenario (same as existing scenario) is provided in section A.1 "...in the absence of the proposed project activity, electricity will be supplied by the generation mix..." d. Sectoral scope and category is provided in section A.1 e. Project location map is provided in section A.2.4 f. Response awaited 			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.2			
Reasoning for not acceptance or close out		Date of review: 04/07/2012	
<ul style="list-style-type: none"> a. The appendix 4,5 and 6 are added back in revised PDD. Closed b. Date format on cover page revised, which is in line with PDD completion guidelines. Closed c. The confirmation on baseline scenario as identified in section B.4 of the PDD is provided in section A.1. Closed d. The category of the project is still not mention in section A.1. Open e. The physical map of project location is provided in section A.2.4 of the PDD. Closed. f. The response is pending at client end. Open 			
Project Participant's response		Date: 15/08/2012	
(d) category is mentioned in section A.1			
(f) diagram is provided in section A.4			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.3			
Reasoning for not acceptance or close out		Date of review: 27/09/2012	



<p>(d) The PP has incorporated the category of project in revised PDD version 1.3. Closed</p> <p>(f) The life time of the project activity and flow diagram including major equipment is provided in PDD version 1.3, which was found consistent with technical description and on site observation. However, the flow diagram mentions export of power to Sumatra grid, which is not consistent with identification of electricity system in project description and other section of the PDD. Open</p> <p>(g) Section A.4, it is particularly not clear if the project participant listed are private or public firm. Open</p> <p>(h) the description of project location in section A.2.4 is changed as 100 Km south east from Bandung from 70 Km south of Bandung, which is not correct as per site visit observation and with webhosted PDD version 01. Open</p>		
Project Participant's response	Date: 04/10/2012	
<p>(f) The flow diagram has been revised showing that the project activity exports electricity to the Jamali grid.</p> <p>(g) Both PGE and South Pole Carbon Asset Management Ltd. are private entities as shown in the deed of establishment. Section A.4 of PDD has been revised accordingly.</p> <p>(h) PDD section A.2.4 is revised, distance is 70 km south of Bandung</p>		
Documentation Provided as Evidence by Project Participant		
Revised PDD version 1.4		
Deed of establishment of PGE and South Pole Carbon Asset Management Ltd.		
Reasoning for not acceptance or close out	Date of review: 08/10/2012	
<p>(f) the flow diagram is revised in PDD version 1.4, which is found correct and appropriate. Closed</p> <p>(g) The name of the project participant mentioned in section A.4 of the revised PDD version 1.4 is correct and in line with guidelines for completing the PDD. Closed</p> <p>(h) the description of the project location is corrected. Closed</p>		
Date of acceptance or non-acceptance	Date: 08/10/2012	Status: Closed

Date	Type & Number	Raised by	Reference
04/06/2012	CAR 03	Assessment Team	Annex-I, D-32
Non conformities raised			
a) All the applicability conditions of the applied approved methodology ACM002, version-13.0 are not discussed in section B.2 of the PDD (refer para 76 of VVS 02)			
Project Participant's response	Date: 25/06/2012		
Applicability conditions is revised following ACM002 ver.13			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.2			
Reasoning for not acceptance or close out	Date of review: 04/07/2012		
All applicability conditions are included in PDD. Closed			
Date of acceptance or non-acceptance	Date: 04/07/2012	Status: Closed	

Date	Type & Number	Raised by	Reference
04/06/2012	CAR 04	Assessment Team	Annex-I, D-32
Non conformities raised			
a) No explanation provided on identification of project boundary in section B.3 of the PDD, also the flow diagram of the project activity, physically delineating the project activity is not provided. Further, the selection of sources of GHG gases is not explained appropriately, Which is not in line with Guidelines for Completing The Project Design Document Form, version-01, annex-8 of EB66 Report (refer para 82 of VVS 02)			
b) Section B.4 of the PDD does not describes the national policies and circumstances in identification of baseline scenario. (refer para 93 of VVS 02)			
c) In context of the same, please also explain if the project is receiving any comparative benefit or advantage due to national or sectoral policy.			



Project Participant's response		Date: 25/06/2012	
<ul style="list-style-type: none"> a) -- b) National policies and circumstances information is provided in section B.4 c) This project activity possibly receive fiscal benefit in terms of VAT exemption for imported equipments. However this is not considered significant to the total investment amount, since this can only be applied to the power plant imported equipments (not applicable to wells drilling works and other local products). 			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.2			
Reasoning for not acceptance or close out		Date of review: 04/07/2012	
<ul style="list-style-type: none"> a) The response is pending from PP. b) The local and national policies are not explained in context of E+/E- policies. c) Please quantify the total exemption and include it in investment analysis CAR is open			
Project Participant's response		Date: 15/08/2012	
<ul style="list-style-type: none"> a) project boundary diagram is provided in section B.3 b) National policy and circumstances information with regard to the E+/E- is provided in section B.4 c) estimated amount of power plant investment is based on general rule of thumb for small to medium size geothermal power plant (USD 1,500,000 / MW) and also elaborated by PGE staff on validation meeting, other benefit or advantage was already included on the part of contractor expenditures amount (does not impact PGE consideration). 			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.3			
Reasoning for not acceptance or close out		Date of review: 27/09/2012	
<ul style="list-style-type: none"> a) The flow diagram for the project boundary, physically delineating the project activity is not provided in section B.3. Moreover, the diagram referred from section A.3 is not correct (please refer CAR02). Open b) The national policies and circumstances in context of E+ and E- have been discussed in PDD. Based on review of the description provided in PDD version 1.3 and host country regulation/policies related to power sector, the validation team considers the description provided is appropriate. Closed c) The tax exemption due import of technology is already considered in detailed project report and the same was confirmed by the validation team by document review and interviewing with financial officer of the PGE. Closed 			
Project Participant's response		Date: 04/10/2012	
Physical delineation of the proposed project activity has been included in section B.3 of revised PDD. At the same time, flow diagram in section A.3 of PDD has been revised. Therefore, the flow diagram in section A.3 could also be referred to.			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.4			
Reasoning for not acceptance or close out		Date of review: 08/10/2012	
The flow diagram is incorporated in section B.3 of the PDD version-1.4, the same is found to be inline with site visit observation and project description.			
Date of acceptance or non-acceptance		Date: 08/10/2012	Status: Closed

Date	Type & Number	Raised by	Reference
04/06/2012	CAR 05	Assessment Team	Annex-I, D-32
Non conformities raised			
<ul style="list-style-type: none"> a) Based on document review and chronology of the events indicated in section B.5 of the PDD, the start date of the project activity does not seems in line with the CDM glossary of CDM terms, it is not particularly clear why the signing of agreement for well drilling equipment is not considered as start date of the project activity, which seems the first real action towards implementation of the project activity. b) The document review reveals that the project title mentioned in the prior intimation form submitted to CDM EB and DNA of host country is different than the project title used in PDD. 			



c) The supportive for identification of Nall and Ndiff is not provided to validation team.	
d) The documentary support for the following input values, used to calculate the IRR, were not provided; <ul style="list-style-type: none"> - Escalation in O&M cost - Repayment period - Rate of Depreciation 	
e) Non involvement of ODA funding was not provided by PP	
Project Participant's response	Date: 25/06/2012
a) Geothermal wells drilling contract cover several wells drilling work packages to be performed by drilling contractor. This is typically done by PGE periodically, to maintain contractor readiness for PGE long term planning activities (on various geothermal fields under development). Specific work on Karaha geothermal power plant development was started by Karaha project manager assignment letter to start work on particular well drilling activity.	
b) "Project Kamojang Unit 5 PT. Pertamina Geothermal Energy" is the same project as "Kamojang Unit 5 Geothermal Project" submitted to the prior consideration forms submitted to CDM EB and DNA. This is similar to the other geothermal CDM projects by PGE, where the prior consideration forms were submitted to CDM EB and DNA. For example the project no.4 (Lumut Balai) and no.5 (Ulubelu) listed in the cover letter to that prior consideration forms had completed validation and has been submitted to UNFCCC registration, using similar name format style on PDD title and the prior consideration project title style for each of those project.	
c) Reference docs for common practice is submitted	
d) Reference docs for IRR calculation (O&M cost escalation, repayment period and depreciation rate) based on Feasibility Study report	
e) Response is pending from PP.	
Documentation Provided as Evidence by Project Participant	
Electricity Statistic 2010.pdf	
Reasoning for not acceptance or close out	Date of review: 04/07/2012
a) It is accepted that date of contract signing for drilling may not be appropriate start date because it is a common framework contract that gets revised periodically. However, PP is required to submit the existing framework contract to justify the argument. Open	
b) It has been confirmed from the letter sent to DNA and UNFCCC that the investment decision for implementing the project activity was communicated to UNFCCC before the start date. However, the latest prior consideration form needs to be submitted by the client.	
c) The common practice analysis should only include projects which have implemented similar technology i.e. geothermal energy and are delivery the same type of output. The argument for differentiating the project activity from other projects shall include the projects which are excluded from the analysis.	
d) The FSR is not readable. Please submit the clearly scanned copy.	
e) Response is pending from PP.	
Project Participant's response	Date: 15/08/2012
a) Drilling contract is submitted to DOE	
b) Latest prior consideration form is submitted to DOE	
c) Common practice analysis is revised in section B.4 (data from Electricity Statistic 2010 Table 9, Table 10)	
d) Clean FSR copy is submitted to DOE	
e) Letter of non-ODA funding is submitted	
Documentation Provided as Evidence by Project Participant	
Kamojang Drilling contract.pdf	
Kamojang prior consideration latest.pdf	
Kamojang non-ODA funding.pdf	
Revised PDD version 1.3	
Reasoning for not acceptance or close out	Date of review: 27/09/2012
a) The validation team has reviewed the framework drilling contract between PT Pertamina Geothermal Energy and PT Antareja Resources dated 13/12/2010, which is a generic framework contract for development of geothermal resources of the PP and cannot be considered as start dated. Considering above the equipment mobilization for well drilling is considered as the start date of the project activity. Closed	



<p>b) The latest prior consideration form with geo-coordinates as pointed out of UNFCCC secretariat was not provided. Open</p> <p>c) The common practice analysis is revised in PDD version 1.3, which is found in line with applied tool. Closed</p> <p>d) The clear copy of Feasibility Study Report (original and English version) is provided. The O&M cost is mentioned in FSR as USD 24000 per annum without escalation. Also the PP has not considered any debt in the FSR. However, the value used in investment analysis spreadsheet and PDD version 1.3 for depreciation is not consistent. Furthermore, the host country regulation on rate of depreciation and maximum depreciable amount was not provided to validation team. Open</p> <p>e) The PP has provided an undertaking letter dated 02/08/2012 for non-use of ODA for the proposed project activity. The same has been reviewed and found appropriate. Closed</p>	
Project Participant's response	Date: 04/10/2012
<p>(b) The latest prior consideration form with geo-coordinates as sent to UNFCCC is being submitted.</p> <p>(d) Depreciation rate as per FS report page 21 is differentiated between upstream (wells, make up wells) and downstream (power plant) investment. For upstream, PGE considered 10 years straight-line depreciation (or equals to 10 % p.a. for 10 years), while for downstream PGE considered 20 years straight-line depreciation (or equals to 5 % p.a. for 20 years). Upstream cost to be depreciated is USD 36,600,000, total capital cost of upstream activity (without taking into account development cost of upstream activity, as per page 20 in the FS report). Meanwhile, downstream cost to be depreciated is USD 45,600,000 (as per page 20 in the FS report), which is total capital cost for power plant development. The depreciation assumption has been inline with the host country regulation. Total depreciation by following the Indonesian regulation is higher than depreciation value calculated by PGE shown in the FSR page 25, thus higher depreciation will result into a higher IRR, which is more conservative.</p> <p>The depreciation method and total capital costs to be depreciated have been incorporated in the PDD v1.3 and IRR v.2.1, also have been inline and consistent with the FSR and are deemed reasonable.</p>	
Documentation Provided as Evidence by Project Participant	
<p>Revised PDD version 1.4 Revised ER-IRR calculation version 2.1 Depreciation rate regulation in Indonesia FSR Kamojang page 20, 21, 25 Revised prior consideration of the CDM form dated 26/08/2010</p>	
Reasoning for not acceptance or close out	Date of review: 08/10/2012
<p>(b) the PP has provided the revised prior consideration of the CDM form, and communication details with CDM EB, the review of the same reveals that the revised form was prepared to include the geo-coordinates as per CDM EB secretariat review request dated 16/09/2012. However, the date on prior consideration of the CDM form mentioned as 16/08/2010, which is prior to its revision and does not seems in line with chronology. Open</p> <p>(d) based on explanation above and review of supportive, the validation considers the depreciation rate used is appropriate in context of the project activity and same has been correctly calculated in IRR spreadsheet. Closed</p>	
Project Participant's response	Date: 09/10/2012
<p>(b) On 30 August 2010, president director of PGE sent out a letter to inform the Indonesian DNA about PGE's intention to register several geothermal power plants as CDM projects, one of them is Kamojang 5 geothermal power plant. Attached to the letter is prior consideration of the CDM form dated 26 August 2010, which described in detail the proposed project activity. A month later, on 16 September 2010, PGE wrote E-mail to UNFCCC secretariat together with the prior consideration of the CDM form dated 26 August 2010 (the same form was sent to the Indonesian DNA). However on 29 September 2010, PGE is requested to complete the prior consideration of the CDM form by inserting the proposed project's geo-coordinates. Taking into account this request on 12 October 2010, PGE sent out the revised prior consideration of the CDM form (with</p>	



geo-coordinates of the project activity) without changing the date on the old form, which is seen as the revision of the prior consideration of the CDM form prepared before asked by the UNFCCC. Considering all E-mail communication to DNA and UNFCCC including the form revision, PPs have managed to be fully inline with the Guidelines on the demonstration and assessment of prior consideration of the CDM even though PPs did not change the date of the prior consideration of the CDM form.

Documentation Provided as Evidence by Project Participant

Prior consideration sent to the Indonesian DNA
 Prior consideration sent to UNFCCC including its revised version

Reasoning for not acceptance or close out | **Date of review: 09/10/2012**

Based on response above the validation team noted that the prior intimation was only revised to include the geo-coordinates. Closed

Date of acceptance or non-acceptance | **Date:** 09/10/2012 | **Status:** **Closed**

Date	Type & Number	Raised by	Reference
04/06/2012	CAR06	Assessment Team	Annex-I, D-32

Non conformities raised

- a) The data/parameter used in investment analysis spreadsheet is not consistent with the PDD in context of following
 - Project title
 - Start date of the crediting period for project activity
 - Reference for source of value
 - Baseline electricity system indicated in spreadsheet is not consistent with PDD (Jamali)
 - Capital cost value used within excel sheet are not consistent
 - The value of total project cost is not consistent in investment analysis spreadsheet, FSR and PDD
 - Date of investment decision mentioned on benchmark sheet in financial spread sheet (21 Jan 2010) is not consistent with PDD (12 July 2010) i.e. Board Approval date
 - Further, the beta value used in investment analysis is not consistent with the reference provided. Additionally, please also justify the relevance of the reference in context of the project since project is implemented in Indonesia while the reference does not provide any context of the data.
- b) The input values for investment analysis sourced from Feasibility Study Report (FSR), however, no supportive provided regarding approval of FSR from concerned authority of the host country. We have observed that information at many places in FSR are hidden, however we require complete information of FSR in English language to perform validation.
- c) Third party report for the plant load factor (PLF) as required by "Guidelines for the Reporting and Validation of Plant Load Factors" Annex 11 to EB 48
- d) In section B.6.1 of the PDD, the equation used to calculate the project emission is not in line with applied approved methodology ACM0002, version-13.0. The term $PE_{HP,y}$ has been removed from the equation without any justification.
- e) The emission factor calculation details is not provided in section B.6.1 and appendix-4 of the PDD. Also the same is not included in emission reduction spreadsheet.

Project Participant's response | **Date:** 25/06/2012

- a) Title is revised
- b) no requirement from any authority for FS report approval
- c) Load factor value 90% is also stated on the PPA clause 5, with electricity buyer (PLN)
- d) $PE_{HP,y}$ is clarified in PDD section B.6.1
- e) The ex-ante Jamali EF Grid value has recently been updated by the Indonesian DNA using the latest available data from 2008 to 2010. The updated EF grid value is 0.741 tCO₂/MWh, please refer to DNA webpage :
<http://pasarkarbon.dnpi.go.id/web/index.php/dnacdm/read/23/updates-on-emission-factors-of-electricity-interconnection-systems-2011.html>.
 However, spreadsheet of the updated EF grid calculation could not be provided as per DNA e-mail confirmation.



Documentation Provided as Evidence by Project Participant	
DNA confirm grid EF Jamali e-mail.pdf Revised PDD version 1.2	
Reasoning for not acceptance or close out	Date of review: 04/07/2012
<p>a) OPEN Additional Comment:</p> <ul style="list-style-type: none"> i. PPA discussed the tariff rate and mentions that it is linked to USPPPI. However, the investment analysis considers a flat price of 9 USD cents/KWh. (target price for negotiation team). An interaction with FSR preparation team to take place to understand the basis for tariff determination. ii. The break-up of investment cost needs to be included in the IRR calculation iii. Evidence for Funding arrangement negotiations with banks iv. References for tax calculation <p>OPEN</p> <p>b) Further evidences are required to cross-check the input values used in the FSR. OPEN</p> <p>c) The PLF values used in investment analysis is also checked from PPA signed between PT Pertamina Geothermal Energy and PT PLN (PERSERO) dated 11/03/2011, which is in line with Annex-11, EB48. Closed</p> <p>d) The PP has corrected the same and has incorporated the justification, which is in line with applied methodology. Closed</p> <p>e) The emission factor calculation is incorporated in PDD, the values used and calculation are found correct. Closed</p> <p>The CAR is Open</p>	
Project Participant's response	Date: 15/08/2012
<p>a) PPA tariff (also explained in PDD page 13 Sensitivity on revenue, and in the footnote) and investment amount issues were discussed with FSR preparation team for reference clarification, and also the tax reference is submitted to DOE.</p> <p>b) Contract for wells drilling is submitted to DOE, data values were discussed with PGE staff on-site meeting</p>	
Documentation Provided as Evidence by Project Participant	
Geothermal tax regulation.pdf Revised PDD version 1.3 IRR version-02	
Reasoning for not acceptance or close out	Date of review: 27/09/2012
<p>a) The data/parameter used in investment analysis spreadsheet is still not consistent with the PDD in context of following</p> <ul style="list-style-type: none"> • Start date of the crediting period and start date of the project activity is still inconsistent in IRR spreadsheet • The reference against value used for make-up well maintenance cost as 13,000,000 USD is not found in FSR. Moreover the cost is higher compared to other geothermal projects in the host country. • The value of depreciation used in investment analysis spreadsheet is not consistent with the values mentioned in FSR <p>b) The emission factor calculation is not provided in emission reduction spreadsheet</p> <p>c) The benchmark calculation and values used along with references not provided in IRR spreadsheet</p> <p>d) As per webhosted PDD and discussion during on site visit, the proposed project activity will be partly funded by owners equity and partly by long term loan. However, the IRR is calculated considering 100% project cost as Owners equity. Furthermore, JICA preparatory survey report 2010 (provided dated 25/09/2012) also mentions that loan component as 59.1%. Considering above, the justification provided in PDD (i.e. no loan) and considering total project cost as equity is not appropriate.</p> <p>e) The equations used to calculate cost of equity in the PDD version 1.3 is not provided.</p> <p>f) The sensitivity analysis is performed considering 10% increase in project revenue, however, the justification on expected levelised electricity tariff as per equation/approach mentioned in section 8.2.2 of the PPA is not provided.</p> <p>g) The validation team has compared the project cost of the proposed project activity with other registered CDM projects in Indonesia and observed that project cost 2773 USD/kW for project activity is</p>	



<p>significantly higher comparing (UN Ref: 3028- 1200 USD/kW, UN Ref: 5785-2092.72 USD/kW, UN Ref: 5773-2463.18 USD/kW).</p> <p>h) The FSR page no 26 (English version), it is mentioned that the proposed project deemed as feasible pursuant to business condition shall be with economical criteria of 14.46% at a cost of 83.2 million USD, It is not particularly clear if the above IRR is a benchmark or the rate of return for the proposed project based on estimated investment.</p>	
Project Participant's response	Date: 04/10/2012
<p>a) Inconsistencies in the PDD and IRR-ER calculation have been revised as following:</p> <ul style="list-style-type: none">• Start date of the project activity and start date of crediting period in the IRR calculation have been revised and are now consistent with PDD v1.4.• Make up wells cost is already inline with the FS report page 25, a documentation that is available during investment decision time, which is USD 13,930,000 (the cost is not higher than typical well drilling cost, but it is considered to represent 3 make-up wells drilling costs). This cost is reasonable and already stated in the FVR of registered projects Ref. 5773, 5785 and 3193 (page 25).• Values for depreciation in the investment analysis spreadsheet were calculated based the depreciation procedure explained in CAR-5 response above. Those values were not the exactly the same as in the FS report, since the recalculated values provides more conservative IRR. <p>b) As confirmed during site visit to the Indonesian DNA, the Jamali Grid emission factor calculation was not able to be provided but can be reviewed at the Indonesian DNA office. The combined margin of Jamali Grid emission factor could be found under following link: http://pasarkarbon.dnpi.go.id/web/index.php/dnacdm/read/23/updates-on-emission-factors-of-electricity-interconnection-systems-2011.html. This combined margin of Jamali Grid emission factor that has been reviewed and accepted by DOE has been provided in worksheet Table for PDD (Kamojang ER IRR v2.1.xls).</p> <p>c) Benchmark calculation and references are provided in worksheet Benchmark (Kamojang ER IRR v2.1.xls).</p> <p>d) Kamojang unit V geothermal power plant is being developed fully by PT. Pertamina Geothermal Energy (PGE). The Feasibility Study FS report was developed and approved by the Board of PGE. Both cashflow table (page 25) and income statement table (page 26) of the FS report mentioned annual interest payment as being zero, as no loan was to be applied to this project investment. Project financing to this power plant is then provided fully by PGE equity investment. For CDM additionality analysis, Equity IRR is calculated and presented in the PDD. The uploaded PDD version during validation webhosting was wrongly indicating the Project IRR calculation in PDD section B.5 (and therefore WACC benchmark was applied subsequently). This is being revised according to information available in Kamojang FS report, and Equity IRR is applied. Following the "Guidelines on the assessment of Investment Analysis" (EB 62 – Annex 5), Equity returns applicable to Indonesia is then applied to the PDD section B.5.</p> <p>e) Equation to calculate Equity return is provided in PDD section B.4 (substep 2b).</p> <p>f) The PPA was signed after the investment decision date. Nevertheless, the tariff has been calculated applying the formula in the PPA. The levelised tariff obtained from this application is 89.75 USD/MWh.</p> <p>g) Geothermal power plant in other registered projects are significantly larger than Kamojang geothermal power plant. Registered project Ref. 3028 with 60 MW capacity was twice larger and started operation six years before this project activity with significantly different economic situation and much lower global energy price. The registered project Ref. 3028 construction started in early 2006 (did not take into account some wells drilling costs in the past) is USD 1,200/kW. While registered project Ref. 3193 started construction in 2007 (also did not take into account some wells drilling cost prior to investment decision) required USD 1,500/kW, despite it was nearly twice larger than the registered project Ref. 3028 (which should have lower investment cost due to economic of scale) but its construction started a year later, and EPC cost for registered project 3193 escalated by nearly 30%. Latest registered geothermal projects Ref. 5773 and 5785 are nearly four-times larger than Kamojang geothermal project that have economic of scale advantage. The registered project Ref. 5773 has investment cost of USD 2,463/kW, which is lower than Kamojang geothermal due to cost efficiency of its much larger capacity. On the other hand, registered project Ref. 5785, which is similar to Ref. 5773, excluded 10 wells as they have drilled prior to investment decision date (refer to Validation Report page 160, first paragraph) and its total investment is higher than project Ref. 5773. The JICA report mentioned in above point (d) was for this project Ref. 5785 Lumut Balai unit 1-2 geothermal, and it is explained that total investment costs of up to USD 332 million (or USD 3,018/kW, not including PGE admin cost, contingency etc.) is quite reasonable. This value for Project Ref. 5785 based on JICA report would also be applicable to Project Ref. 5773, since both power plants has the same capacity. The value is higher than initial estimation of project developer, which representing more</p>	



realistic estimation which may actually happen during development and construction. This value is much higher than Kamojang geothermal total investment costs. Based on explanation above, Kamojang investment cost is deemed appropriate considering its capacity and current economic situation.

h) Clarification is provided that FS report page 26 was showing table for calculation result IRR of the project's financial analysis based on estimated investment (the same table is also showing the project's financial analysis calculation results for other economic parameters, e.g. NPV, PI, etc.).

Documentation Provided as Evidence by Project Participant

Revised ER-IRR calculation version 2.1
 Revised PDD version 1.4
 PGE clarification letter regarding full equity financing
 Levelized price PPA – US CPI spreadsheet
 JICA report for investment cost justification

Reasoning for not acceptance or close out

Date of review: 08/10/2012

- (a)
1. The start date of crediting period and date of expected commercial operation of the project activity is corrected in revised IRR spreadsheet, which is now consistent with the supportive and description in PDD. Closed
 2. The value used and reference against make up well cost is found consistent with value mentioned in FSR. Closed
 3. Based on explanation provided above and review of the host country regulation regarding depreciation rates, the validation team considers the value used for investment analysis is reasonable and appropriate. Closed
- (b) The emission factor calculation is incorporated in revised spreadsheet, which is found in line with discussion held with DNA of Indonesia. Closed
- (c) The source referred for cost of equity as Appendix A of 'Guidelines on the Assessment of Investment Analysis', Version 05, 15 July 2011, was not available at the date of investment decision i.e. 12/07/2010 mentioned in PDD. The appropriateness of the revised benchmark and input value used for investment analysis at the time of investment decision and their supportive to validate the same was not submitted to validation team. (Please refer para 6 of Annex-5 of EB62 Report). Open
 Further, the reference provided for inflation rate in host country is not clear to validate its availability prior to investment decision. Open
- (d) Based on review of FSR, validation team confirms that the FSR for proposed project was prepared considering 100% equity. However, as mentioned in response above that PGE's past geothermal projects were developed considering equity only, not consistent with information in registered project activity i.e. UN Ref. 5773 and 5785, where a loan amount of 62.09% was considered for investment analysis. Open
- (e) The equation to calculate equity in nominal terms is provided in revised PDD version 1.4 and IRR spreadsheet, which is correctly applied. Closed
- (f) The PP has calculated the levelised tariff as per PPA, which comes out to be 89.75 USD/MWh. The value used for investment analysis i.e. 90 USD/MWh is higher, hence considered as appropriate and conservative. Closed
- (g) The validation team has reviewed per MW project cost from "cost of geothermal power and factors that affect it" by Subir K Sanyal dated 26-28 January 2004, wherein author has suggested the per MW cost for project with installed capacity 30MW, binary geothermal power plant as 2319 USD/MW and O&M cost as 1.88 cents/kWh. Furthermore, the study shows that per MW project cost decreases with increase in installed capacity.
 The team has also reviewed the analysis on "Geothermal Heat and Power" by Energy Technology Systems Analysis programme date May, 2010, wherein the per MW cost for binary geothermal power plant is suggested as 3400 to 4500 USD/MW and O&M cost as 120 USD/kW/annum.
 Which clearly reveals that project cost has increased from 2004 to 2010, and the CDM registered projects with lower project cost has been conceptualized either prior to 2007 or having installed capacity significantly higher than proposed project activity.



<p>Considering above and the explanation provided by the PP, validation team considers the project cost for proposed project activity i.e. 2773 USD/MW is reasonable and appropriate. Closed</p> <p>(h) Based on response above, the value mentioned above was the estimate project IRR based on estimated cost and not the benchmark for the project activity. Closed</p>		
Project Participant's response		Date: 09/10/2012
<p>(c) The use of default values has been done on account of conservativeness. It can be observed that the benchmark value in the published PDD as well as other registered projects from the PP have higher benchmark values. The benchmark of registered projects UN Ref. 5773 and 5785 is higher (19.67%) as compared to the benchmark calculated for Kamojang 5 geothermal project (17.91%).</p> <p>To fulfill 5 years inflation rate forecast, the host country statistic data is not available. Therefore, IMF World Economic Outlook (WEO) report in April 2010 is referred to in the benchmark calculation of the project activity. Data is sourced from IMF website: http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?pr.x=41&pr.y=9&sy=2008&ey=2015&ssd=1&sort=country&ds=.&br=1&c=536&s=PCPI%2CPCPIPCH&grp=0&a=.</p> <p>(d) PGE projects UN Ref. 5773 and 5785 investment costs for geothermal wells drilling used PGE equity, and since each of them has capacity of 110 MW (with total investment cost of USD 270.95 million and USD 230.2 million), then investment costs required for wells drilling would be larger than total investment required for Kamojang 5 power plant development. This clearly shows financial capability of PGE for such level of investment required. However, since those projects were also using loan financing for power plant investment, they are not considered here any longer.</p> <p>In addition to that, other PGE registered project UN Ref. 3028 has also been constructed by using equity as confirmed by PGE. This project investment is at similar scale as Karaha power plant.</p>		
Documentation Provided as Evidence by Project Participant		
Revised IRR-ER calculation version 2.2		
Revised PDD version 1.5		
Reasoning for not acceptance or close out		Date of review: 08/10/2012
<p>c) Based on review of registered geothermal project by PP, wherein the benchmark value was considered as 19.67% (WACC) at the time of investment decision i.e. 21/01/2010. Whereas the revised benchmark for the proposed project activity as 17.91% (cost of equity) is lower. Moreover the benchmark considered for registered project is in same time span and valid for the project activity as well, hence validation team considers the value used as appropriate and conservative. Closed</p> <p>The value has been verified from the webpage link and found correct and authentic. Closed</p> <p>d) As FSR was prepared considering means of finance as equity only. Furthermore, given the scale of investment and earlier experience of PP, the validation team considers the means of finance as 100% equity is feasible. Closed</p>		
Date of acceptance or non-acceptance		Date: 09/10/2012
		Status: Closed

Date	Type & Number	Raised by	Reference
04/06/2012	CAR07	Assessment Team	Annex-I, D-32
Non conformities raised			
<p>a) The parameters, operating margin emission factor and build margin emission factor, used to calculate combined margin emission factor of identified electricity system are not provided in section B.6.2 of the PDD.</p> <p>b) The monitoring equipments have to be calibrated in a defined frequency i.e. at least once in three year from the third party as per the requirement of monitoring plan. The frequency of calibration of energy/steam equipment is not provided in PDD.</p> <p>c) The PDD mentions the use of sampling approach for estimating the mass fraction of non-condensate gases (CO2 and CH4) in steam. However, sampling approach is not described in section B.7.2 of the PDD.</p>			



Project Participant's response	Date: 25/06/2012
<p>a) The ex-ante Jamali EF Grid value has recently been updated by the Indonesian DNA using the latest available data from 2008 to 2010. The updated EF grid value is 0.741 tCO₂/MWh, please refer to DNA webpage : http://pasarkarbon.dnpi.go.id/web/index.php/dnacdm/read/23/updates-on-emission-factors-of-electricity-interconnection-systems-2011.html. However, spreadsheet of the updated EF grid calculation could not be provided as per DNA e-mail confirmation.</p> <p>b) Calibration period information is provided in PDD section B.7.1</p> <p>c) Sampling approach information is provided in PDD section B.7.1</p>	
Documentation Provided as Evidence by Project Participant	
DNA confirm grid EF Jamali e-mail Revised PDD version 1.2	
Reasoning for not acceptance or close out	Date of review: 04/07/2012
<p>a) Section B.6.2 is required to be updated to include complete information about OM and BM calculations and final results. Also Pending due to discussion with DNA.</p> <p>b) Calibration frequency for steam meters needs to be justified with comparison with the host country regulations and manufacturer specifications/market trends.</p> <p>c) Sampling approach is not discussed in section B.7.2 as per EB 65 Annex 2.</p> <p>d) Single Line diagram to show monitoring equipments and their location shall be included.</p> <p>CAR is open</p>	
Project Participant's response	Date: 15/08/2012
<p>a. OM and BM calculation is provided, from discussion with Indonesian DNA staff</p> <p>b. calibration for steam meters is provided in section B.7.1, according to the national regulations</p> <p>c. sampling approach is explained in section B.7.2</p> <p>d. single line diagram is provided in section B.3</p>	
Documentation Provided as Evidence by Project Participant	
Revised PDD version 1.3 Power Purchase Agreement dated 11/03/2011	
Reasoning for not acceptance or close out	Date of review: 27/09/2012
<p>a) The PP has provided the webpage link of the source for combined margin emission factor published DNA of Indonesia. Based on reviewed the information available on DNA website and review of the detailed calculation available in DNA office during site visit. The values mentioned in PDD found conservative. However, the operating margin emission factor and build margin emission factor are not provided using the table as per PDD template. Open</p> <p>b) The PP has referred the calibration frequency for energy meter as 5 years and 7 years as per Decree of Trade Ministry no.44/M-DAG/PER/12/2011 Clause 3 point 3.b (calibration period is 10 years), and Decree of Energy Ministry no.03 year 2007 on Jamali Grid Code, Article MC.4.1.1 (calibration interval is 5 years).</p> <p>1) However PPA clause 6.2.1 requires calibration of energy meters each year, hence the value considered is not appropriate and acceptable. Open</p> <p>2) No reference for the calibration frequency mentioned for steam meter was provided. Open</p> <p>c) The sampling plan has been incorporated in section B.7.1 of the PDD, the same has been reviewed and found appropriate and in line with ASTM Standard Practice E1675 for Sampling 2-Phase Geothermal Fluid for Purposes of Chemical Analysis. Closed</p> <p>d) The single line diagram is provided in PDD, which is found consistent with the project description and observation during onsite visit. Closed</p>	
Project Participant's response	Date: 04/10/2012
<p>(i) Operating margin and build margin emission factors have been provided using table as per PDD template.</p> <p>(j) Calibration frequency of energy meters have been revised to once per year following PPA signed between PGE and PLN. At the same time, steam meter calibration has been revised to once per year also as per Monitoring Report (page 9) of Kamojang IV geothermal project that is operated by PGE</p>	



under following link: http://cdm.unfccc.int/Projects/DB/RWTUV1255101629.04/view		
Documentation Provided as Evidence by Project Participant		
Monitoring Report of Kamojang IV geothermal project Revised PDD version 1.4		
Reasoning for not acceptance or close out	Date of review: 08/10/2012	
(a) The ex-ante parameter operating margin emission factor and build margin emission factor correctly included in revised PDD version-1.4. Closed (b) The calibration frequency is revised for energy and steam meter as once in a year, which is in line with host country requirement. Closed		
Date of acceptance or non-acceptance	Date: 08/10/2012	Status: Closed

Date	Type & Number	Raised by	Reference
04/06/2012	CAR08	Assessment Team	Annex-I, D-32
Non conformities raised			
The date of notice for stakeholder consultation process and media used for invitation is not provided in PDD. Further, the stakeholder invitation letter provided to validation team dated 04/05/2012 is in Local language and English translation is to be provided by PP.			
Project Participant's response		Date: 25/06/2012	
The invitation letter was sent on 4 May 2012 through village offices of Ibun sub-district and villages, English translation is provided. PDD section E.1 is revised accordingly.			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.2			
Reasoning for not acceptance or close out		Date of review: 04/07/2012	
English version of the invitation letter is pending from client. CAR is open.			
Project Participant's response		Date: 15/08/2012	
English translation is provided.			
Documentation Provided as Evidence by Project Participant			
Stakeholder invitation – English.pdf Revised PDD version 1.3			
Reasoning for not acceptance or close out		Date of review: 27/09/2012	
The validation team has reviewed the English translation of stakeholder notice dated 04/05/2012 and found appropriate and acceptable. However, the date of stakeholder invitation is not provided in section E.1 of the PDD. Open			
Project Participant's response		Date: 04/10/2012	
Date of stakeholder invitation has been provided in section E.1. of the revised PDD.			
Documentation Provided as Evidence by Project Participant			
Revised PDD version 1.4			
Reasoning for not acceptance or close out		Date of review: 08/10/2012	
The date of notice for invitation of stakeholders is incorporated in revised PDD version 1.4., which is found consistent with stakeholder invitation notice.			
Date of acceptance or non-acceptance	Date: 08/10/2012	Status: Closed	

Date	Type & Number	Raised by	Reference
04/06/2012	CL09	Assessment Team	Annex-I, D-32



Non conformities raised		
In reference to the implementation timeline of the project for CDM consideration as stated in section B.5 of the PDD, please provide the following documents;		
<ul style="list-style-type: none"> a) Copy of board meeting for investment decision with CDM b) Head of Agreement between PGE and PLN c) Contract for well drilling works d) ERPA signed with South Pole Carbon Asset Management Ltd. e) Annual report of Pertamina Geothermal Energy 		
Project Participant's response	Date: 25/06/2012	
a) PGE board Report is provided on webpage : http://www.pge.pertamina.com/index.php?option=com_phocadownload&view=category&id=1:annual-report&Itemid=18		
Documentation Provided as Evidence by Project Participant		
PT Pertamina Geothermal Energy Annual Report 2010		
Reasoning for not acceptance or close out	Date of review: 04/07/2012	
<ul style="list-style-type: none"> a) PGE board meeting is still pending b) Head of agreement is still pending c) Response is pending from PP d) The PP has provided ERPA signed between PT Pertamina Geothermal Energy and South Pole Carbon Asset Management Ltd. Closed e) The PP has provided the webpage link for the Annual Report for year 2010, the same has been downloaded and reviewed by the validation team. Closed 		
CL is open		
Project Participant's response	Date: 15/08/2012	
<ul style="list-style-type: none"> a) PGE board meeting document is provided b) Head of Agreement document is provided c) Wells drilling contract document is provided 		
Documentation Provided as Evidence by Project Participant		
<ul style="list-style-type: none"> 1. PGE board decision dated 12/07/2010 2. Head of Agreement between PT Pertamina Geothermal Energy and PT PLN (PERSERO) dated 17/02/2010 1. Well drilling contract 		
Reasoning for not acceptance or close out	Date of review: 27/09/2012	
<ul style="list-style-type: none"> a) The team has reviewed the board decision along with attendance sheet, wherein based on feasibility study report the proposed project activity has been approved dated 12/07/2010. This is found consistent with the information provided in PDD. Closed b) The validation team has reviewed the Head of Agreement between PT Pertamina Geothermal Energy and PT PLN (PERSERO) dated 17/02/2010, wherein PLN (PERSERO) transfers the Geothermal projects development activities to PT Pertamina Geothermal Energy. Closed c) The well drilling contract has been reviewed and found acceptable. Closed d) The ERPA between PP and South Pole Carbon Asset Management Ltd. was not provided. Open 		
Project Participant's response	Date: 04/10/2012	
Copy fully signed ERPA between South Pole Carbon Asset Management Ltd. and PT. Pertamina Geothermal Energy is being provided.		
Documentation Provided as Evidence by Project Participant		
The ERPA signed between South Pole Carbon Asset Management Ltd. and PT. Pertamina Geothermal Energy dated 17/04/2012.		
Reasoning for not acceptance or close out	Date of review: 08/10/2012	
The team has reviewed the ERPA and found appropriate.		
Date of acceptance or non-acceptance	Date: 08/10/2012	Status: Closed

Date	Type & Number	Raised by	Reference
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23/10/2012	CAR10	Assessment Team	TR Comment
Non conformities raised			
<ul style="list-style-type: none"> a) The gross installed capacity mentioned in PDD is 31.8MW; however, the project emission calculated using net installed capacity 30MW, which is not correct. b) The sources used to calculate average mass fraction for CO₂ and CH₄ in steam produced was not provided. c) The fare value was not considered at the end of assessment period in investment analysis, however, no justification provided. d) Section-3: statement of agreement, requires signature of only one authorized signatory primary or alternate, however, the MoC is signed by both. e) It was observed during site visit that Kamojang unit IV is operational and the proposed project will be installed next to existing unit, no justification provided why the proposed project activity is not considered as capacity addition. f) Justification and appropriateness for considering equity IRR for investment analysis is not provided in PDD. Moreover, it is not discussed whether the benchmark is compared with post tax equity IRR or pre tax and its appropriateness with selected benchmark. g) It is not particularly clear why the range was calculated using net installed capacity for common practice analysis and not the gross installed capacity. h) The value used for EG_{facility,y} is not consistent with other sections of the PDD. i) The EIA approval details with appropriate reference is not provided in section E.1 of the PDD. 			
Project Participant's response		Date: 24/10/2012	
<ul style="list-style-type: none"> a. Project emissions are calculated using gross installed capacity. PDD and spreadsheet revised accordingly. b. Source used to calculate average mass fraction for CO₂ and CH₄ in steam produced is provided to DOE (example lab test result sheet from power plant inlet sampling point, before separator) c. Fair value (conservatively 10% of investment) is considered at the end of assessment period in investment analysis. PDD and spreadsheet revised accordingly. d. MoC with only 1 primary or alternate signature from each project participant is being provided to DOE. e. Kamojang unit V is not a capacity addition / retrofit / expansion. Justification is provided in PDD section A.3 last paragraph, and section B.4 first paragraphs. f. Justification and appropriateness for considering equity IRR is provided in PDD section B.5, and also discussion that the benchmark is compared with post-tax equity IRR is provided. g. The common practice analysis is provided in PDD section B.5 using gross installed capacity. PDD is revised accordingly. h. Value EG_{facility,y} (236,520) is made consistent throughout PDD. i. EIA approval description is provided in PDD section E.1 			
Documentation Provided as Evidence by Project Participant			
<p>Revised PDD version-1.6 dated 24/10/2012</p> <p>Appraising Equipment for Structured Finance Transactions Creating Residual Value Curves to Reflect Physical Depreciation, Obsolescence and Useful Life By: D. Gregg Dight, ASA dated 16/05/2003</p> <p>Lab test report for average mass fraction of CH₄ and CO₂ in steam produced dated 03/01/2012</p>			
Reasoning for not acceptance or close out			



- a) The project emission calculated using the gross installed capacity 31.8 MW as 18,354.04 tCO₂/year, project emission has been rounded up to 18,355 tCO₂/year, which is conservative. Closed
- b) The PP has provided the lab test report for average mass fraction of CH₄ and CO₂ in steam produced for existing Kamojang Unit IV, the value used is found reasonable and appropriate. As the steam quality for proposed CDM project will be similar to existing unit, hence the same was found acceptable. Closed
- c) The PP has considered fare value as 10% of project cost, which is reasonable as per national/international guidelines for considering fare value for similar type of project activity. Closed
- d) The PP has provided the revised MoC, which is correctly filled using latest version of MoC form. Closed
- e) Based on explanation provided in revised PDD version-1.6 and on site observation the validation team confirms that the proposed project activity will not share any of the existing facilities (steam header, geothermal wells), hence cannot be considered as capacity addition. Closed
- f) The justification for considering the equity IRR and appropriateness of selected benchmark is clearly mentioned in revised PDD, the same is found appropriate. Closed
- g) The range of installed capacity for common practice analysis is corrected based gross installed capacity, which is appropriate. Closed
- h) The value of EG_{facility,y} is corrected in section B.7.1 of the revised PDD and is now consistent with other sections of the PDD. Closed
- i) The details of EIA approval is incorporated and is consistent with supportive provided. Closed

Date of acceptance or non-acceptance	Date: 26/10/2012	Status: Closed
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Annex 3: Certificate of Competence

Personnel Name:		Phool Chand	
Qualified to work as:			
Team Leader	<input type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		12/12/2011	

Personnel Name:		Abhishek Mahawar	
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input checked="" type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		06/04/2012	

Personnel Name:		Yenni Sembiring	
Qualified to work as:			
Team Leader	<input type="checkbox"/>	Technical Expert	<input type="checkbox"/>
Validator/Verifier	<input type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert (Indonesia)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Not applicable		Not applicable	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		20/12/2011	



Personnel Name:		Sunil Kathuria	
Qualified to work as:			
Team Leader	<input type="checkbox"/>	Technical Expert	<input type="checkbox"/>
Validator/Verifier	<input type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input checked="" type="checkbox"/>	Local Expert (India)	<input type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Not applicable		Not applicable	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		10/09/2012	

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>
Validator/Verifier	<input checked="" type="checkbox"/>	Financial Expert	<input type="checkbox"/>
Technical Reviewer	<input type="checkbox"/>	Local Expert (India)	<input checked="" type="checkbox"/>
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		09/02/2012	

History of the document

Version	Date	Nature of revision	Reviewed by	Approved by
3.0	05/09/2012	Revised for VVS track	Manager CDM Quality 07/09/2012	Managing Director 10/09/2012
2.0	31/12/2011	Comprehensively revised	Manager CDM Quality 31/12/2011	Managing Director 31/12/2011