




**Validation report form for post-registration changes for  
CDM project activities  
(Version 03.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Olkaria II Geothermal Expansion Project UNFCCC no.: 3773
<b>Process track</b>	<input type="checkbox"/> Prior approval <input type="checkbox"/> Issuance <input checked="" type="checkbox"/> Renewal of crediting period
<b>Version number of the validation report</b>	2.0
<b>Completion date of the validation report</b>	11/08/2020
<b>Type(s) of PRCs</b>	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents <sup>1</sup> <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
<b>Version number of PDD to which this report applies</b>	12.0
<b>Project participants</b>	<b>Kenya:</b> Kenya Electricity Generating Company Ltd. (KenGen) <b>Netherlands:</b> Netherlands' Ministry of Infrastructure and the Environment (IenM) <b>Austria:</b> Kommunalkredit Public Consulting GmbH <b>Germany:</b> KfW <b>Denmark:</b> Maersk Olie og Gas A/S, DONG Energy Slag and service A/S; Nordjysk Ethandel A/S, Danish Ministry of Climate, Energy and Building, /Danish Energy Agency; Aalborg Portland A/S <b>Sweden:</b> Goteborg Energi AB <b>Italy:</b> Government of Italy-Ministry for the

<sup>1</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

	<p>Environment, Land and Sea</p> <p><b>Finland:</b> Ruukki Metals Oy</p> <p><b>Spain:</b> Kingdom of Spain- Ministry of Agriculture, Food and Environment &amp; Ministry of Economy and Competitiveness; EDP Energias de Portugal, S.A.; Endesa Generacion, S.A., Gas Natural SDG S.A.;</p> <p><b>Japan:</b> Idemitsu Kosan Co., Ltd.; The Okinawa Electric Power Co., Inc. ;</p> <p><b>Norway:</b> Statoil ASA; Statkraft Carbon Invest AS</p> <p><b>Switzerland:</b> Schweizerische Ruckversicherungsgesellschafts AG (Swiss RE)</p> <p><b>Luxembourg:</b> Ministry for Sustainable Development and Infrastructure</p> <p><b>Bilateral and Multilateral Funds:</b> Managing Company - International Bank for Reconstruction and Development (IBRD) as Trustee of the Community Development Carbon Fund (CDCF)</p>
<b>Host Party</b>	Kenya
<b>Applied methodologies and standardized baselines</b>	ACM 0002 Version 19-Grid-connected electricity generation from renewable sources
<b>Mandatory sectoral scopes</b>	1. Energy industries (renewable sources)
<b>Conditional sectoral scopes, if applicable</b>	NA
<b>Name and UNFCCC reference number of the DOE</b>	Earthood Services Private Limited E-0066
<b>Name, position and signature of the approver of the validation report</b>	 Dr. Kaviraj Singh Managing Director

## SECTION A. Executive summary

The main aim of the Olkaria II Geothermal Expansion Project is to add a third generating unit of 35 MW, thereby increasing the capacity and average annual generation of the existing Olkaria II Geothermal Power Plant.

Olkaria I and Olkaria II is owned and operated by the Kenya Electricity Generating Company (KenGen). Olkaria I, has installed capacity of 45MW and Olkaria II has installed capacity of 70 MW (2x35MW). Thus, the steam gathering capacity of the two power stations is approximately 98MW. The steam surplus between the two power stations is about 53MW. A third generating unit was added to make use of this surplus steam.

In the absence of the project activity, this electricity would have been generated using fossil fuel-based electricity generation units operating in the country. The project activity resulted in reduced greenhouse gas emissions by displacing the fossil-fuel-based electricity generation in the Kenyan grid with clean geothermal power.

### Scope of validation

Earthood Services Private Limited is contracted by the PP to perform the validation of the post registration changes proposed to the revised approved PDD/1/. The scope of validation includes the assessment of the proposed PRCs primarily identified by the assessment team as corrections at the time of RCP. This validation is an independent and objective review of all the post registration changes proposed in the RCP PDD against criteria stipulated in latest valid versions of CDM Validation and Verification Standard (VVS)/2/, CDM Project Standard (PS)/3/, CDM Project Cycle Procedures (PCP)/4/ and other related and relevant requirements, as appropriate.

### Validation process

The validation process is undertaken by a qualified and competent validation team, involving a desk review of proposed post registration changes as proposed in the revised PDD provided by PP, interview or interactions with the representatives of PP, reporting and closure of findings, as appropriate and preparing a draft validation report complying with the relevant CDM requirements. The validation report prepared by the validation team is reviewed by an independent Technical Review team. The final validation report that is accepted by Technical Reviewer is then approved on behalf of Earthood Services Private Limited and processed further as per CDM procedures.

### Conclusion

The review of the revised PDD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) have provided ESPL with sufficient evidence to determine the fulfilment of stated criteria.

ESPL has performed the validation of the post registration changes of the CDM PA "Olkaria II Geothermal Expansion Project" having UNFCCC Ref. Number 3773. The post registration change was identified during the RCP of the Project activity.

The proposed post registration change includes the following:

- a) Correction of description of the monitored parameter EG<sub>facility,y</sub>
- b) Correction of KenGen General Management Structure
- c) Correction of value applied for ex-ante parameter DATE<sub>Baselinerefit</sub>

The validation of post registration changes concluded that the type of changes proposed in the revised PDD Version 12, dated 11/08/2020 /1/ can be categorized under Appendix of CDM PS and hence does not require prior approval by the CDM EB as per procedures. The validation confirms that the proposed post registration changes comply with all the relevant CDM requirements of the applied methodology and all other applicable tools and guidance.

This report is the combined assessment opinion for all the changes from the revised approved PDD and request is hereby submitted with issuance request to CDM EB.

**SECTION B. Validation team, technical reviewer and approver****B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
2.	Validator	IR	Guleria	Shifali	Central Office	Y	N	N	Y
3.	Local Expert	ER	Njata	Virginia Njeri	Central Office	Y	Y	Y	Y
4.	Technical Expert	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
5.	Methodology Expert	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y

**B.2. Technical reviewer and approver of the validation report on PRCs**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Gautam	Ashok	Central Office
2.	Technical Expert to TR	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

**SECTION C. Means of validation****C.1. Desk/document review**

The complete list of documents/evidences reviewed or referenced during the validation is provided in the Appendix 3

**C.2. On-site inspection**

Duration of on-site inspection: 22/07/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered CDM project activity as per the registered PDD or any approved revised PDD;	Olkaria, Kenya	22/07/2019	Deepika Mahala, Virginia Njeri Njata
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters;			Deepika Mahala, Virginia Njeri Njata
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan;			Deepika Mahala, Virginia Njeri Njata
4.	A cross check between information provided in the monitoring report and data from other sources such as plant			Deepika Mahala, Virginia Njeri Njata

	logbooks, inventories, purchase records or similar data sources;			
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;			Deepika Mahala, Virginia Njeri Njata
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions;			Deepika Mahala, Virginia Njeri Njata
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters;			Deepika Mahala, Virginia Njeri Njata

### C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Metto	James	Kenya Electricity Generating Company PLC	22/07/2019	Project Activity (Technology, Location and Implementation)	Deepika Mahala, Virginia Najeri
2.	Belenky	Lucas	World Bank	22/07/2019	Project Activity (Technology, Location and Implementation)	Deepika Mahala, Virginia Najeri
3.	Kirkou	Stanley	Kenya Electricity Generating Company PLC	22/07/2019	Monitoring schedule and procedures	Deepika Mahala, Virginia Najeri
4.	Ndegwa	John	Kenya Electricity Generating Company PLC	22/07/2019	Monitoring schedule and procedures	Deepika Mahala, Virginia Najeri

### C.4. Sampling approach

No sampling approach was applied by the DOE since all data was validated.

### C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	CAR#02	-
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
Corrections	CL#01	-	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan	-	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-

Changes to the project design	-	-	-
Changes specific to afforestation and reforestation project activities	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>01</b>	<b>01</b>	<b>00</b>

## SECTION D. Validation findings

### D.1. Compliance with PDD form

<b>Means of validation</b>	The revised PDD/7/ (both in track-change and clean versions) complies with the valid version of the applicable PDD form/5/ and the instructions therein. The valid version as per UNFCCC website was found to be 11.0 and same version has been applied by PP. PP has used the latest valid version (11.0) of the PDD for preparing the revised PDD/7/, therefore, it is confirmed that the information transferred to the later valid version of the PDD/5/ form is materially the same as that in the revised approved PDD (Version 8.0)/1/ except for the content of proposed PRCs.
<b>Findings</b>	CAR#02 was raised and resolved.
<b>Conclusion</b>	The validation team confirms that the proposed post registration changes as included in the revised PDD/7/ have been presented by using the valid version of CDM-PDD-FORM/5/ and were found complying with the instructions contained therein. PP has used the latest version of PDD FORM/5/ and the validation team confirms that the information transferred in this process is materially the same except the proposed post registration changes (listed under further sections).

### D.2. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

### D.3. Corrections

<b>Means of validation</b>	<p><b><u>Following corrections have been made in the revised PDD (Version 11.0)</u></b></p> <p>1. <i>Description of parameter <math>EG_{facility,y}</math> revised to 'Quantity of net electricity generation supplied by the existing and added power units in year y':</i></p> <p>The latest approved PDD/1/ version 8.0 on page 22 mentioned description of the monitored parameter '<math>EG_{facility,y}</math>' as '<b>Total electricity supplied to the Kenyan grid by existing and added power units in year y</b>', which has been updated in accordance with version 19 of applied methodology/6/.</p> <p><b><u>Assessment of the correction:</u></b></p> <p>The description of the parameter <math>EG_{facility,y}</math> mentioned in the revised approved PDD/1/ on page 22 did not reflect the description appropriately as compared to the updated methodology version 19/6/, which is being used in revised PDD version 12/7/ as part of Renewal of Crediting Period. Thus, for a more accurate portrayal of the parameter in line with updated methodology/6/, it was revised to 'Quantity of net electricity generation supplied by the existing and added power units in year y'. Hence, following para 287 of the VVS for PA version 2/2/, correction of the description of the parameter information was identified by the assessment team.</p> <p>Since, the correction in the description of the parameter does not affect the project design and is in compliance with the project methodology/6/ and only enhances the information in revised PDD version 12/7/, the correction proposed was found to be acceptable.</p> <p>The corrected parameter description was found to be an accurate reflection of actual project information and in compliance with applied methodology, as required</p>
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by para 288 of VVS for PA/2/.

**2. Change of fixed parameter value *DATE<sub>baselinereetrofit</sub>* from year '2022' to '2025':**

The revised approved PDD/1/ on page 19 mentions the value applied for ex-ante parameter '*DATE<sub>baselinereetrofit</sub>*' as 'Year 2022' which was found to be inconsistent with the technical lifetime of the equipment stated in the technical specification of the equipment/9/, which were available at the time of registration.

**Assessment of the correction:**

The value applied for the ex-ante parameter mentioned in the revised approved PDD/1/ was mentioned on page 19 as 2022. The lifetime of equipment mentioned in both, the revised approved PDD version 8.0/1/ and the latest revised PDD (Version 12.0)/7/ are the same i.e. 200,000 hours, which was found to be in line with technical specification of the equipment provided at the time of purchase by manufacturer Kingston Morrison/9/ in 1999. The equipment was installed in the year 2003 as per the commissioning date already validated in the registered and revised approved PDD/1/.

According to the option (a) in methodological tool 10/8/ (which is used as per applied methodology/6/ to determine lifetime of equipment), the manufacturer's specifications can be used to estimate the technical lifetime of the equipment from the date of first commissioning, if the following conditions are met:

1. Manufacturer information on the equipment lifetime is available;
2. Project participants can demonstrate the equipment has been operated and maintained as per the manufacturer specifications;
3. There is no periodic replacement schedule or scheduled replacement practices; and
4. The equipment has no design flaw or defect and did not have an industrial accident causing equipment to be unable to operate at performance levels.

All the above mentioned conditions were found to be met as confirmed through on-site interviews and contract documents/9/, annual inspection reports/11/,/12/, and maintenance procedures and work instructions document/13/ which additionally confirms that remaining lifetime of steam turbines is the lifetime determined by the manufacturer.

The operational lifetime of the equipment as per the purchase contract/9/, and as also stated in footnote 16 on page 15 of the approved PDD(Version8.0)/1/, is 200,000 hours from date of commissioning of the equipment, which equals to 22.8 years (200,000 hours /8760 hours/year). A rounded down value of 22 years has been applied instead of 22.8 years as a conservative approach.

According to the completion report for Olkaria II/14/, The unit turbine was rolled on 23/07/2003 and synchronised 2 days later, the operational acceptance certificate for Unit 1 was issued on 30/09/2003 and for Unit 2 on 20/11/2003. According to the aforesaid report, the generating units were commissioned in September and November 2004, respectively. However, the PP has clarified that year 2004 as commissioning date is a typographical error in the report and actual commissioning has happened in 2003. To support the statement, the PP has provided a report published by Ministry of Energy and Petroleum titled "Development of a Power Generation and Transmission Master Plan, Kenya"/15/. The report/15/ on page 115 mentions the year of commissioning as 2003. Additionally, the revised approved PDD, page 4/1/ also mentioned the commissioning date as September 2003. For determination of date on which the turbines will have to be replaced (*DATE<sub>BaselineRetrofit</sub>*), date of technical operation of turbine I has been considered i.e., 30/09/2003. Therefore, considering 22 years from 29/09/2025, the point in time when equipment shall be replaced would be 29/09/2025.

It was calculated that 2,00,000 hours (22.8 years) from the date 30/09/2003 gives a value of 22/07/2026 for the parameter. The CME has considered the age to be 22

years and taken a shorter period till 29/09/2025. The approach was found to be conservative.

The lifetime of equipment was also cross-checked against the default lifetime of steam turbines as per applied 'Tool 10 Version 1.0'/8/. Since, the value applied for the technical lifetime of the equipment (22 years) is within the default lifetime (25 years) of the steam turbines and also, since the information used to propose this change is not a deviation from information that was already available at the time of registration of project activity, the change was accepted by the validation team.

Hence, following para 287 of the VVS for PA version 2/2/, correction of the value applied for the parameter was identified by the assessment team and the revisions were found to be made by project participants in compliance with para 232 of PS for PA.

As the correction in the value applied of the parameter does not affect the project design and complies with the project methodologies/6/ and only enhances the information in the PDD, the proposed correction to revise parameter value of DATE<sub>baselinereetrofit</sub> from 2022 to 29/09/2025 found to be acceptable by the validation team.

Consequential Changes: Pertaining to the changes in the parameter value correction assessed above, some corresponding changes were also made to section B.6.1 of revised PDD/7/ to provide more accurate presentation of data. All changes in section B.6.1 were found to be in line with assessment above and only enhance the information provided in revised PDD/7/ and therefore, the proposed changes were accepted by the validation team.

### *3. Correction of management structure, monitoring points and monitoring procedure graphics:*

The revised approved PDD/1/, on page 30, shows the diagram of the general management structure of KenGen which was inconsistent with the actual management structure followed on-site.

#### **Assessment of the correction:**

The general management structure of KenGen has changed since the time of registration, with creation of a division in charge of Geothermal Development. The updated management structure elaborately states the flow of management system in place to ensure the proper implementation and working of the project activity. The following changes to the management structure have been made:

1. At the time of registration Operations Division was managing the plant operations, which now is being managed by Geothermal Development department.
2. A more clarified function in charge of CDM monitoring activities has been defined
3. Name of Regulatory Affairs Division has been changed to Corporate and Regulatory Services Division

During the on-site visit, it was confirmed through interviews and direct observations of organizational charts that the updated management structure is being followed.

Hence, following para 287 of the VVS for PA version 2/2/, correction of the general management structure followed on-site was identified by the assessment team.

As the correction in the general management and structure does not affect the project design and complies with the project methodologies/6/ and only enhances the information in the PDD, the correction proposed in section B.7.3 of revised PDD/7/ under 'Operational and Management Structure' was found to be acceptable.

The PDD has been revised to remove the names of the PPs which are withdrawn. The withdrawal request was approved before the DOE has been approached for

	<p>RCP. Thus, the change is just a minor correction to present the right information in the latest PDD.</p> <p>4. <i>Correction of monitored parameter <math>M_{steam,y}</math>, (Quantity of steam produced during the year <math>y</math>) to reflect parameter correct measurement methods and procedures of the monitored parameter.</i></p> <p>A statement has been added on page 29 of the revised PDD/7/ for the parameter <math>M_{steam,y}</math>, "Cumulative steam from the main meter and auxiliary meter are recorded and used to calculate steam consumption". The statement just provides clarity of determining the final value of the parameter. The measurement method is still the same as the revised approved PDD/1/ and is in line with the applied methodology/6/. Thus, the change was found to fall under the category of 'correction'.</p> <p>The validation team also noted that the above-proposed corrections do not impact the project design of the project activity. Thus, falls under category (a) of Appendix of CDM PS PA Version 2 /3/, Therefore it would not require a prior approval by the CDM EB.</p>
<b>Findings</b>	CL#01 was raised and resolved.
<b>Conclusion</b>	<p>The corrections made are line with the para 232 of PS for PA/3/ and para 288 of VVS for PA ver 02.0/3/. It was confirmed that:</p> <ol style="list-style-type: none"> <li>1. the corrected information is an accurate reflection of actual project information;</li> <li>2. the corrected parameters are in accordance with the applied methodologies, the registered monitoring plan, the applied standardized baselines and the other applied methodological regulatory documents</li> <li>3. The changes proposed are applicable from the beginning of the second crediting period. Thus, the request for PRC is submitted along with RCP in line with para 290 of PCP for PA/4/.</li> </ol>

**D.4. Changes to the start date of the crediting period**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**D.5. Inclusion of a monitoring plan**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**D.7. Changes to the project design**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**D.8. Changes specific to afforestation and reforestation project activities**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**SECTION E. Internal quality control**

The draft validation report prepared by validation team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood Services Private Limited were duly complied with and whether such opinion/conclusion were reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scopes the project activity / PoA falls into. All team members of technical review team were independent of the validation team. During the technical review process, additional findings may be identified, or the closed-out findings may be opened, which needs to be satisfactorily resolved by validation team before the validation report/opinion is finalized. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the validation team. The decision taken by the Technical Reviewer is final and is authorized by the Managing Director on behalf of Earthood Services Private Limited.

**SECTION F. Validation opinion**

Earthood Services Private Limited (ESPL) has performed the validation of the post registration changes of the PA 3773: **Olkaria II Geothermal Expansion Project**. The validation was performed on the basis of rules and requirements defined by UNFCCC for the CDM PAs. The review of the PDD, supporting documentation (if any) and subsequent follow-up actions (including on-site inspection and interviews), have provided ESPL with sufficient evidence to determine the fulfillment of stated criteria. The proposed corrections comply with the CDM PS, CDM VVS and CDM PCP. The description as contained in the revised PDD meets all relevant UNFCCC requirements for the CDM and correctly applies the monitoring methodology/ies, standardized baseline. This report is the combined assessment opinion for all the changes that are proposed in the revised PDD (Version 12.0) as the changes are acceptable as a correction to the revised approved PDD (Version 8.0).

## Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating or Managing Entity
CP	Crediting Period
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
ESPL	Earthhood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
PoA-DD	Programme Of Activity Design Document
PRC	Post Registration changes
TA	Technical Area (with in Sectoral Scope)
TR	Technical Reviewer
UNFCCC	United Nations Framework Convention on Climate Change

## Appendix 2. Competence of team members and technical reviewers

Competence Statement	
<b>Name</b>	Deepika Mahala
<b>Country</b>	India
<b>Education</b>	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU
<b>Experience</b>	3 Years +
<b>Field</b>	Climate Change
<b>Approved Roles</b>	
<b>Team Leader</b>	YES
<b>Validator</b>	YES
<b>Verifier</b>	YES
<b>Methodology Expert</b>	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G
<b>Local expert</b>	YES (India)
<b>Financial Expert</b>	NO
<b>Technical Reviewer</b>	YES
<b>TA Expert</b>	YES (TA 1.2 & TA 3.1)

<b>Reviewed by</b>	Shreya Garg	<b>Date</b>	14/09/2018
<b>Approved by</b>	Anshika Gupta	<b>Date</b>	14/09/2018

Competence Statement			
<b>Name</b>	Virginia Njeri		
<b>Country</b>	Kenya		
<b>Education</b>	Diploma (Business Management)		
<b>Experience</b>	7 Years		
<b>Field</b>	Administration		
<b>Approved Roles</b>			
<b>Team Leader</b>	No		
<b>Validator</b>	No		
<b>Verifier</b>	No		
<b>Methodology Expert</b>	No		
<b>Local expert</b>	Kenya		
<b>Financial Expert</b>	No		
<b>Technical Reviewer</b>	No		
<b>TA Expert</b>	No		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	01/03/2018
<b>Approved by</b>	Ashok Kumar Gautam	<b>Date</b>	01/03/2018

Competence Statement			
<b>Name</b>	Ashok Gautam		
<b>Country</b>	India		
<b>Education</b>	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
<b>Experience</b>	16 Years +		
<b>Field</b>	Energy, Climate Change & Environment		
<b>Approved Roles</b>			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B		
<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	YES		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
<b>Reviewed by</b>	Shreya Garg	<b>Date</b>	25/01/2019
<b>Approved by</b>	Anshika Gupta	<b>Date</b>	25/01/2019

Competence Statement			
<b>Name</b>	Shifali Guleria		
<b>Education</b>	M.Sc. (Environmental Studies and Resource Management), TERI University		
<b>Experience</b>	1+ year		
<b>Field</b>	Climate Change		
<b>Approved Roles</b>			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	NO		
<b>Local expert</b>	YES		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	NO		
<b>TA Expert</b>	YES (1.2, 3.1)		
<b>Reviewed by</b>	Shreya Garg (Quality Manager)	<b>Date</b>	24/09/2019
<b>Approved by</b>	Anshika Gupta (Technical Manager)	<b>Date</b>	25/09/2019

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	KenGen	Revised approved PDD	Version 8.0 14/10/2014	PP
2	UNFCCC	Validation and Verification standards for Project activity	Version 2.0	Others
3	UNFCCC	CDM PS for PA	Version 2.0	Others
4	UNFCCC	CDM PCP for PA	Version 2.0	Others
5	UNFCCC	CDM PDD FORM	Version 11.0	Others
6	UNFCCC	Methodology: ACM0002- Grid-connected electricity generation from renewable sources	Version 19	Others
7	KenGen	Revised PDD	Version 9.0 27/05/2019 Version 12.0 11/08/2020	PP
8	UNFCCC	Tool 10: Tool to determine the remaining lifetime of the equipment	Version 1.0	Others
9	Kingston Morrison	Olkaria II contract document "OG 102 Bid document"	Volume 3.0	PP
10	UNFCCC	UN webpage for PA: <a href="https://cdm.unfccc.int/Projects/DB/DNV-CUK1276170328.71/view">https://cdm.unfccc.int/Projects/DB/DNV-CUK1276170328.71/view</a>	-	Others
11	KenGen	Annual Inspection Reports: Mechanical	2016 2017-18	PP
12	KenGen	Annual Inspection Works Reports	2013	PP

			2014-15	
13	KenGen	Maintenance procedures and Work instructions	Rev-04	PP
14	Sinclair Knight Merz Ltd.	Completion report for unit 1 and unit 2	December, 2004	PP
15	Ministry of Energy and Petroleum	Development of a Power Generation and Transmission Master Plan, Kenya	28/11/2016	PP

## Appendix 4. Clarification requests, corrective action requests and forward action requests

**Table 1. CLs from this validation**

CL ID	01	Section no.	D.3	Date : 18/03/2020
Description of CL				
Under section B.6.2 of revised PDD for fixed parameter ' <b>DATEBaselineRetrofit</b> ', the parameter value has been updated from 2022 to 2028 using electricity generation data from years 2017,2018 and 2019. According to PS for PA footnote 24 on page 51, the parameter values fixed ex ante cannot be updated as it is not regarded as correction. PP shall justify how this change is valid in accordance with PS and shall also clarify that how information pertaining to this change was already available at the time of registration and can be considered as a mistake.				
Project participant response				Date : 18/03/2020
Footnote 24 states that "this provision does not allow the parameter values fixed ex ante to be updated at the time of registration of the CDM project activity". The ex ante parameter is corrected, not updated, and the correction is undertaken at the crediting period renewal, not the time of registration.				
Documentation provided by project participant				
X				
DOE assessment				Date: 18/03/2020
<ol style="list-style-type: none"> <li>1. Changing the value of the parameter cannot be considered as a correction if PP cannot demonstrate that the value was available at the time of registration.</li> <li>2. The manufacturer specifications show a lifetime of 200,000 hours which translates to 22.8 years, not 25 years.</li> </ol>				
Open				
Project participant response				Date : 19/03/2020
<ol style="list-style-type: none"> <li>1. The value has been revised to reflect evidence available at the time of registration</li> <li>2. The lifetime has been updated to 22.8 years.</li> </ol>				
Documentation provided by project participant				
DOE assessment				Date: 27/03/2020
<ol style="list-style-type: none"> <li>1. The revised information in PDD version 11.0 is in line with the information and evidence available at the time of registration. Closed</li> <li>2. The revised information in PDD version 11.0 provides an accurate description of the equipment lifetime in line with technical specifications of steam turbines. However, it's not clear from the documents provided that on what exact date (dd/mm/yyyy) the project was commissioned. PP is requested to confirm the date of commissioning with supporting document, so that the exact duration of equipment lifetime could be determined. Open</li> </ol>				
Project participant response				Date : 07/04/2020
DOE has been provided a new evidence showing certificate of operational acceptance in September of 2003. The date has been revised on page 17 as well, with the new footnote.				
Documentation provided by project participant				
NA				
DOE assessment				Date: 21/04/2020

The document that you have submitted has multiple dates.

- the completion report mentions on page 4 that generating units were commissioned in Sept and Nov 2004
- the same report mentions that the operational acceptance certificate were issued in Sept and Nov 2003 (making is inconsistent with above)
- there are also other events e.g., the time they were rolled, synchronized few months earlier (Jul and Sep 2003).

Project participant response

Date : 21/04/2020

This is to clarify the old units are two and were commissioned separately this is the reason for two dates. The earliest date is confirmed by the report provided as September 2003 which was indicated in the old validated PDD as the commissioning date. Please also refer to the Power Generation and Transmission Master Plan, Kenya Long Term Plan 2015 – 2035 Vol I – Main Report hosted by the Energy Sector regulator ( Energy and Petroleum Regulatory Authority (EPRA) (<https://www.epra.go.ke/download/power-generation-and-transmission-master-plan-kenya-long-term-plan-2015-2035-vol-i-main-report/>) also indicating the COD for Olkaria 2 (the entire plant as 2003 – Page 54. This demonstrates that 2004 was a typing error by the Consultants SKM in the completion report page 4, it should have been 2003 as detailed in page 9.

The other dates are due to the need for mandatory reliability tests by the contractor before a power plant is commissioned. If there are technical issues they have to be rectified by the contractor before acceptance by the client and thereafter commissioning in accordance to the PPA, this may take months.

Based on the principle of conservativeness the date of retrofit has been based on the earliest date of commissioning based on available information which is September 2003. On conservative basis, the earliest date of rolling on turbine 1- 23/07/2003 is applied to determine Date\_baseline retrofit.

Documentation provided by project participant

NA

DOE assessment

Date: 19/06/2020

According to the completion report for Olkaria II/14/, The unit turbine was rolled on 23/07/2003 and synchronised 2 days later, the operational acceptance certificate for Unit 1 was issued on 30/09/2003 and for Unit 2 on 20/11/2003. According to the aforesaid report, the generating units were commissioned in September and November 2004, respectively. However, the PP has clarified that year 2004 as commissioning date is a typographical error in the report and actual commissioning has happened in 2003. To support the statement, the PP has provided a report published by Ministry of Energy and Petroleum titled “Development of a Power Generation and Transmission Master Plan, Kenya”. The report on page 115 mentions the year of commissioning as 2003. Additionally, the revised approved PDD, page 4/1/ also mentioned the commissioning date as September 2003. For determination of date on which the turbines will have to be replaced (DATEBaselineRetrofit), earliest of all these dates have been considered i.e., the date on which turbine 1 was rolled on. Therefore, considering 22 years from 30/09/2003, the point in time when equipment shall be replaced would be 22/07/2025.

The proposed change to the ex-ante parameter DATE baseline retrofit is not an accurate date as required by page 23 of ACM0002 version 19, since the point in time when equipment shall be replaced would be 22/07/2025 considering the operational lifetime of 200,000 hours from date of commissioning of the existing power generation equipment (i.e. 30/09/2003). As well paragraph 55 of ACM0002 version 19 requires determining this parameter in a conservative manner. PP shall demonstrate the compliance with this requirement. (Open)

Project participant response

Date : 19/06/2020

The parameter DATE baseline retrofit has been revised to 31/08/2025 with an explanation added in the PDD along with explanation of how the estimate is conservative.

Documentation provided by project participant

Revised PDD

DOE assessment

Date: 25/06/2020

PP shall explain what has been considered as date of commissioning to calculate the value of the parameter and transparently show the conservativeness. (open)

Project participant response	Date : 25/06/2020
<p>The considered commissioning date is 30/09/2003 as indicated in the commissioning report. The equipment lifetime is provided as 200,000 hrs defined by the plant design specifications. Considering an annual operation of 365 days gives 8,760 hours per year. The equipment lifetime will therefore be 22.8 years (200,000 hrs ÷ 8,760 hrs/yr). The PP however has chosen to round off the equipment lifetime to 22 yrs to be conservative. The PP has therefore chosen a lower equipment lifetime as a conservative approach.</p> <p>The point in time when equipment shall be replaced has now been changed to 29/09/2025 considering the operational lifetime of 200,000 hours from date of commissioning of the existing power generation equipment (i.e. 30/09/2003).</p>	
Documentation provided by project participant	
Revised PDD	
DOE assessment	Date: 30/06/2020
<p>The date of issuance of operational acceptance certificate for unit I is 30/09/2003 in the technical operation certificate. This date has been considered as the commissioning date to calculate the value of the parameter Date baseline retrofit. The operational lifetime of the equipment is 2,00,000 hours (equivalent to 22.8years).</p> <p>It was calculated that 2,00,000 hours (22.8 years) from the date 30/09/2003 gives a value of 22/07/2026 for the parameter. The CME has considered the age to be 22 years and taken a shorter period till 29/09/2025. The approach was found to be conservative.</p> <p>Thus, the CAR stands closed.</p>	

**Table 2. CARs from this validation**

CAR ID	02	Section no.	D.1.	Date : 18/03/2020
Description of CAR				
<ol style="list-style-type: none"> <li>Under Appendix 7, provide a summary of the post-registration changes being proposed in this version of the PDD, and where applicable, the history of all post-registration changes to the project activity that have been approved by the Board after its registration. For all post-registration changes, include reasons for the changes and any additional information relating to the changes in line with para 229 of PS for PA</li> <li>Under Appendix 7, also determine and document whether the actual or proposed changes are temporary deviations, or permanent changes (characterizing the type of permanent changes), and whether they require approval by the Board in line with para 230 PS for PA.</li> </ol>				
Project participant response				Date : 18/03/2020
<ol style="list-style-type: none"> <li>Revisions have been made to appendix 7 to include the history of changes and the reason for the changes.</li> <li>The changes have also been listed as corrections.</li> </ol>				
Revised PDD				
DOE assessment				Date: 18/03/2020
<ol style="list-style-type: none"> <li>Justification and reason for some changes is not clear- <ol style="list-style-type: none"> <li>It's not clear why description of monitored parameter was needed to be changed from the description registered initially</li> <li>Reason for update of management structure is not provided in appendix 7.</li> <li>Reason for why fixed parameter Date<sub>baseline,retrofit</sub> was changed from initially determined 2022</li> <li>Also please categorize each change under the types defined in the PS for PA version 2.0.</li> </ol> </li> </ol>				
Open				
Project participant response				Date : 19/03/2020
<ol style="list-style-type: none"> <li>Justification has been added for monitored parameters and updating of the management structure. The reason for fixing DateBaselineRetrofit has been added as well. All changes are categorized as "Corrections"</li> </ol>				
Documentation provided by project participant				
NA				
DOE assessment				Date: 19/03/2020

The categorization and reasons for all changes were found to mentioned in appendix 7 of revised PDD version 11.0 and were found to be appropriate. The finding was found to be addressed satisfactorily and therefore, is now closed.

**Table 3. FARs from this validation**

<b>FAR ID</b>	<b>xx</b>	<b>Section no.</b>	<b>Date: DD/MM/YYYY</b>
<b>Description of FAR</b>			
<b>Project participant response</b>			<b>Date: DD/MM/YYYY</b>
<b>Documentation provided by project participant</b>			
<b>DOE assessment</b>			<b>Date: DD/MM/YYYY</b>

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"><li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);</li><li>• Make editorial improvements.</li></ul>
02.0	31 October 2017	Revision to align with the requirements in the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: post-registration change, project activities, validation report		