Validation report form for CDM programme of activities

(Version 03.0)

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

BASIC INFORMATION	
Title of the programme of activities (PoA)	KOKO Kenya - Ethanol Cookstoves Program
Version number of the validation report	04
Completion date of the validation report	12/07/2019
Version number of PoA-DD to which this validation report applies	05
Date when PoA-DD was uploaded for global stakeholder consultation	16/01/2019
Coordinating/managing entity (CME)	KOKO Networks Limited
Host Parties	Republic of Kenya
Applied methodologies and standardized baselines	AMS-I.E. Version 09.0 - "Switch from non-renewable biomass for thermal applications by the user"
Mandatory sectoral scopes	01: (Energy industries (renewable - / non-renewable sources))
Conditional sectoral scopes, if applicable	Not Applicable
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited 0066
Name, position and signature of the approver of the validation report	 Dr. Kaviraj Singh, Managing Director

SECTION A.Executive summary

This PoA involves promotion and dissemination of bio-ethanol based clean cookstoves to households and institutions/SMEs in Kenya, where the improved cookstove distributed will consume cleaner renewable fuel - bioethanol. Bioethanol based stove enables the end users to switch from a non-renewable biomass(charcoal/wood) to a renewable fuel (Bioethanol). The proposed PoA will help in reducing the use of wood fuel and charcoal, thus curbing the problems caused by its production (cutting down of trees causing deforestation) and consumption (as a cooking fuel which generates smoke and soot). Thus, the PoA will reduce a significant amount of GHG emissions that would have been generated in the baseline scenario to the PoA implementation, where the non-renewable biomass would have been used as a fuel.

The CME of the PoA is KOKO Networks Limited, which will be the sole beneficiary of carbon credits from this PoA. On the basis of the interviews with CME, it is envisaged that the Korean entities like ECOEYE Co. Ltd. will be involved in project financing through purchase of carbon credits thereby lowering the consumer price of stove and covering operation and maintenance cost of the project.

Scope of Validation
The scope of the services provided by Earthood Services Private Limited for the project is to perform validation of Programme of Activity. The scope of validation is to assess the claims and assumptions made in the PoA DD against the UNFCCC criteria, including but not limited to, CDM PCP for PoA version 2.0, CDM PS for PoA version 2.0, CDM VVS for PoA version 2.0, applied methodology AMS-I.E. version 9.0 and other relevant rules and requirements established for CDM project activities.

Validation Process
The validation process is undertaken by the validation team that involves the following:

1. the desk review of documents and evidences submitted by the project participant in context of the reference CDM rules and guidelines issued by CDM EB,

2.undertaking site visit, interview or interactions with the representative of the project participant, reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and

3.preparing a draft validation report for complying with the CDM requirements

4.An independent Technical Review team reviews the validation report prepared by validation 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 PoA DD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) has provided Earthood with sufficient evidence to determine the fulfilment of stated criteria.
Earthood is of the opinion that the PoA “KOKO Kenya - Ethanol Cookstoves Program” as described in the final PoA DD version 5.0, dated 11/07/2019 meets all relevant requirements of CDM, meets host country criteria and has correctly applied the methodology AMS I.E Version 09.0 - “Switch from non-renewable biomass for thermal applications by the user”. Therefore, the project is being recommended to CDM EB for request for registration.

SECTION B.Validation team, technical reviewer and approver

B.1.Validation team members

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	Interview(s)	Validation findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
2.	TA Expert (1.1)	IR	Gautam	Ashok	Central Office	Y	Y	Y	Y
3.	TA Expert (1.2)	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
4.	Methodology Expert	IR	Gautam	Ashok	Central Office	Y	Y	Y	Y
5.	Local Expert	EI	Njata	Virginia Njeri	Central Office	Y	Y	Y	Y

B.2.Technical reviewer and approver of the validation report

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	Garg	Shreya	Central Office
2.	TA expert to TR (1.2)	IR	Garg	Shreya	Central Office
3.	TA Expert to TR (1.1)	IR	Kumar	Sanjeev	Central Office
4.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C.Means of validation

C.1.Desk/document review

The validation of the Programme of Activities is performed primarily as a document review of the PoA design document version 1.0 dated 04/01/2019 and the final version 5.0 dated 11/07/2019. The cross checks between information provided in the PoA DD and information from sources other than those used, if available, the validation team's sectoral or local expertise and, if necessary, independent background investigations.

The complete list of documents/evidences assessed by validation team is included under Appendix 3.

C.2.On-site inspection

Duration of on-site inspection: 28/01/2019 to 30/01/2019, 11/02/2019				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening Meeting: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.	Nairobi, Kenya	28/01/2019	Deepika Mahala
2.	Approval of project activity from Host Party and approval of participation of Project Participant(s).	Nairobi, Kenya	28/01/2019	Deepika Mahala

	Meeting with DNA representative			
3.	Project Activity (Technology, Location and Implementation)	Nairobi, Kenya	28/01/2019	Deepika Mahala
4.	Debundling/Bundling of the project activity	Nairobi, Kenya	28/01/2019	Deepika Mahala
5.	Public Funding of the project activity	Nairobi, Kenya	28/01/2019	Deepika Mahala
6.	Choice and applicability of baseline methodology(ies)	Nairobi, Kenya	28/01/2019	Deepika Mahala
7.	Project boundary and emission sources included in the project boundary.	Nairobi, Kenya	28/01/2019	Deepika Mahala
8.	Physical inspection of the site: Planned areas of dissemination	Nairobi, Kenya	29/01/2019	Deepika Mahala, Virginia Njeri Njata
9.	Baseline identification	Nairobi, Kenya	29/01/2019	Deepika Mahala, Virginia Njeri Njata
10.	Additionality of the project activity (Baseline alternatives, CDM consideration, Investment analysis, identified barriers, Common Practice analysis)	Nairobi, Kenya	29/01/2019	Deepika Mahala
11.	Parameter fixed Ex-ante and Baseline emissions, Project emissions and Leakage calculation	Nairobi, Kenya	29/01/2019	Deepika Mahala
12.	Monitoring plan (feasibility of monitoring arrangements described in PDD, QA/QC procedures, responsibility of implementation of monitoring plan, data recording & storage procedures)	Nairobi, Kenya	29/01/2019	Deepika Mahala
13.	Operational lifetime of the generic project activity, Start date of the PoA, Crediting period	Nairobi, Kenya	29/01/2019	Deepika Mahala
14.	Environmental impacts and need of EIA	Nairobi, Kenya	29/01/2019	Deepika Mahala
15.	Local Stakeholder Consultation process, comments received in Global Stakeholder Consultation (if applicable). Meeting with LSC attendees	Nairobi, Kenya	29/01/2019	Deepika Mahala, Virginia Njeri Njata
16.	Compilation of the findings by Auditor/s (CARs/CLs/FARs)	Nairobi, Kenya	30/01/2019	Deepika Mahala
17.	Technical Aspects of the PoA	Nairobi, Kenya	11/02/2019	Ashok K Gautam

C.3.Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Murray	Greg	KOKO Networks	28/01/2019-30/01/2019	PoA description, Project boundary, Technical description,	Deepika Mahala
2.	Agnew	Ed	KOKO Networks	28/01/2019-30/01/2019	Monitoring plan, baseline scenario, Technical description	Deepika Mahala
3.	Kiviuo	Michael	KOKO Networks (Stove quality assurance)	28/01/2019	Technical description	Deepika Mahala
4.	Mahawar	Abhishek	Consultant	28/01/2019-30/01/2019 11/02/2018	Additionality, Project boundary, Ex-ante and Ex-post parameters Project Technology, project boundary,	Deepika Mahala Ashok K Gautam
5.	Omambia	Dr. Anne	DNA representative	28/01/2019	fNRB value, EIA requirement, DNA comments, Local stakeholder consultation	Deepika Mahala
6.	Langat	Carolina	Clean Cookstove Association of Kenya (CCAK)	29/01/2019	Local stakeholder consultation	Deepika Mahala
7.	Njoroge	Opportuna	LSC attendee	29/01/2019	Local stakeholder consultation	Deepika Mahala, Virginia Njeri Njata
8.	Wambura	Evelyn	Potential user (Resident in the planned area of dissemination)	29/01/2019	Baseline identification	Deepika Mahala, Virginia Njeri Njata
9.	Mulwa	Martin	Potential user (Resident in the planned area of dissemination)	29/01/2019	Baseline identification	Deepika Mahala, Virginia Njeri Njata
10.	Wairimu	Keziah	Potential user (Resident in the planned area of dissemination)	29/01/2019	Baseline identification	Deepika Mahala, Virginia Njeri Njata
11.	Wairimu	Lucy	Potential user (Resident in	29/01/2019	Baseline identification	Deepika Mahala, Virginia Njeri Njata

			the planned area of dissemination)			

C.4.Sampling approach

No sampling approach has been applied.

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

Areas of validation of compliance	No. of CL	No. of CAR	No. of FAR
Programme of activities	-	-	-
Identification of programme type	-	CAR#10	-
Description of PoA	-	CAR#07 CAR#10	-
Management system	CL#03	-	-
Demonstration of additionality of PoA	-	-	-
Start date and duration of PoA	CL#02	-	-
Environmental impacts	-	-	-
Socio-economic impacts	-	-	-
Local stakeholder consultation	-	-	-
Sustainable development co-benefits	-	-	-
Approval	CL#01	-	-
Authorization	CL#01	-	-
Modalities of communication	CL#01	-	-
Global stakeholder consultation	-	-	-
Generic component project activities	-	-	-
General description of generic CPA	CL#03, CL#02		
Selection of methodologies and standardized baselines	-	-	-
•Deviation from methodologies and/or methodological tools	-	-	-
•Clarification on applicability of methodology, tool and/or standardized baseline	-	-	-
Application of methodologies and standardized baselines	CL#04	-	-
•General	-	-	-
•Project boundary, sources and GHGs	-	-	-
•Baseline scenario	CL#02	CAR#10	
•Estimation of emission reductions or net anthropogenic removals	-	CAR#05 CAR#10	FAR#09
•Monitoring plan	-	CAR#06 CAR#07 CAR#08 CAR#10	-
Crediting period type and duration	-	-	-
Eligibility criteria for inclusion of CPAs	-	-	-
Others (please specify)	-	-	-
Total	4	5	1

SECTION D.Validation findings

D.1.Programme of activities

D.1.1.Identification of programme type

Means of validation	The coordinating/managing entity has determined the type of CDM PoA it intends to design as per the PS for PoA version 2.0, para 31/4/. The PoA will include only small-scale non-A/R CPAs.
Findings	No findings.
Conclusion	Based on interview with the CME representatives, the DOE confirms that the proposed PoA will include only small-scale non-A/R CPAs.

D.1.2.Description of PoA

Means of validation	<u>The framework developed for the implementation of the proposed CDM PoA:</u> The PoA titled "KOKO Kenya- Ethanol Cookstoves Program" located in Kenya aims to disseminate bio-ethanol based cookstove that enables switch from a non-renewable biomass to a renewable biomass fuel by the end users, which lead to reduction in GHG emissions. The KOKO office was visited during the site visit by the validation team and the KOKO team members were interviewed to understand the framework of the PoA. The stove kit to be disseminated under the PoA consists of a two-burner ethanol stove and it is equipped with a 'smart' canister equipped with an NFC chip. These cannisters avoid misuse of the fuel. KOKO has installed several cloud-connected KOKO fuel ATMs at local corner shops, which has increased the accessibility and affordability of bioethanol as fuel. The fuel can only be bought/refilled in a smart cannister received with the KOKO stove. All the components were corroborated through visual observations during the site visit. The models may vary in future depending upon the requirements of the end users but the basic components like smart canisters with NFC chip would remain same and would comply to relevant national standards. Detailed Management system is discussed in the section D.1.3. of this report. **<u>Technology/Measures:</u>** The bio-ethanol stove to be disseminated under the CPAs of PoA is a two-burner ethanol stove along with a 'smart' canister equipped with an NFC chip. These cannisters avoid misuse of the fuel as well it helps in tracking of household-level fuel purchases. KOKO has installed several cloud-connected KOKO ATMs at local corner shops, which has increased the accessibility and affordability of Ethanol as a fuel. The fuel can only be bought/refilled in a smart cannisters received with the KOKO stove. All the components were corroborated through visual observations during the site visit. Technical details of the stoves as corroborated from manufacturer's specifications/10/: 1. Stove Efficiency: 60% as corroborated from the manufacturer's specifications. 2.The average lifespan of the stoves is expected to be 10 years. 3. Thermal output 2100W (~2.1 kW)- (For two burner stove- 2.1*2 =4.2 kW) 4.Other design details like fuel capacity, burn time, compliance with Kenyan Standard KS-2759 for ethanol appliances, dimensions and design highlights of the smart cannisters. **<u>Fuel type:</u>** The project involves use of bioethanol in KOKO stoves in Kenya. The bioethanol is mostly obtained as a waste product of Molasses distillation process in the country. The production of bio-ethanol (produced through the distillation of molasses, which is a waste product from the sugar production process) for commercial purpose is the most attractive option in Kenya since it has a high production of sugarcan and relies on imports for its crude oil and natural gas requirements. The document

referred “Baseline Report of Clean Cooking Fuels in the East African Community, GAIA”/47/ was reviewed to confirm the abundant molasses production in East African Countries as stated in the PoA DD/1/. The high production of Molasses ascertain that the procuring bioethanol is easier and cheaper than the synthetic ethanol.

To ensure the use of only bioethanol as the fuel in the project stove, the CME has underlying provisions in the PoA:

1. Partnership with Vivo Energy, which is a reputed Fuel Marketing Company (FMC) as checked from the online published news/53,54/ to procure bioethanol.
2. Fuel protocol as part of framework agreement/50/. The fuel is accepted only after checking the technical parameter and renewable nature of fuel type. Synthetic ethanol is prohibited for procurement as confirmed from the framework agreement.
3. Completely Secured distribution network with no possibility of adulteration or pilferage of bioethanol including exclusive KOKO ATMs to supply fuel to each individual user of the stove as checked during physical site visit.
4. Smart cannisters with customized valve only allowing KOKO ATMs to refill as checked during physical site visit.

Identification of baseline fuel type and baseline appliance:
Baseline fuel type will be identified at the time of cookstove dissemination. The CME’s team will record the information regarding the baseline appliance, replacing KOKO stoves, and thus the baseline fuel type at the time of stove dissemination. The information has been added under CPA implementation process, page 10 of the PoA DD/1/. The CME also plans to monitor during the periodic sampling surveys if the baseline appliance continues to be in use.

The policy/measure or stated goal that the PoA seeks to promote:
As stated above, the introduction of bio-ethanol based cookstove in the areas currently using charcoal/wood, which is a non-renewable biomass, will lead to switch of fuel by the end users as these stoves can only be run on ethanol. Ethanol in Kenya is procured through renewable ways as it is produced from fermentation of molasses, a by-product formed during crystalline sugar production process.

The PoA is a voluntary action by the coordinating/managing entity:
The CME of the PoA is KOKO Networks Limited (KOKO). The title of the PoA and the name of the CME were checked and found to be exactly same as stated in the Letter of Approval obtained from the host country/44/. The LoA also confirmed that the PoA is a voluntary action by the CME. The CME has also submitted filled MOC/30/ form to inform who will be the focal point of CME to communicate with the UNFCCC regarding the project.

PoA contributes to the sustainable development of the host Party
Since the bio-ethanol cookstove consumes renewable fuel, it leads to saving money and time in collecting wood fuel, employs technician for cookstove installations, provides access to new technology and produces no smoke (less indoor air pollution), and thus, the PoA has social, economic and environmental benefits and contributes to sustainable development of host country.

Geographical Boundary of the PoA:
The geographical boundaries will cover entire country; however, the location of the KOKO office, KOKO operation centre and planned areas of distribution visited during the site visit was checked through a mobile application get geo coordinates.

Several energy policies/20-23/ to the proposed PoA were reviewed such as:
1. The Energy Act 2006: National policy and strategy document for short to long-term energy development in Kenya
2. Feed-in Tariff Policy 2008: Development of electricity generation projects from renewable sources
3. The Energy (Energy Management) Regulations 2012: Promotion of Energy

	Management and Conservation in Kenya 4.The Energy Bill 2017: National Integrated Energy Policy However, the policies do not qualify as E+ or E- policy as per PS for PoA version 2.0, para 105 and 106/4/. <u>Generic CPA DD:</u> There is only one generic CPA under Part II of the PoA DD. The PoA plans to implement only measure i.e. switch of fuel form non-renewable biomass to renewable biomass and includes only one methodology- AMS-I.E. version 9.0/2/. Thus, there is no requirement of forming a combination of methodology or measures and preparation of only one generic CPA DD was found appropriate for the proposed PoA. <u>Accuracy and completeness of the PoA DD:</u> 1.The description of proposed CDM PoA in the PoA was found to comply with para 33 of PS for PoA version 2.0/4/. a) The title of the PoA was checked with the LoA/44/ b) Sectoral scopes linked to the applied methodology AMS-I.E. version 9.0 Standard: Applicability of sectoral scope was reviewed/11/. The project does not include any waste handling and disposal procedures or Agricultural component, thus, only the mandatory scope 1 is applicable to the PoA. c) purpose and a general description of the PoA have already been discussed in the former part of this section. d) geographical boundary has already been discussed in the former part of this section. e) technologies employed: The technical description was verified from manufacturer specifications/11/, on-site observations and it meets the methodology requirements/2/as discussed in latter sections of this report. f) use of technology is not transferred to the host party. In line of para 34, PS for PoA version 2.0/4/, the CME has identified parties involved I the proposed CDM PoA, which is Kenya. LoA from the host country has been submitted as a MOV/44/. There is entity involved as the CME and the PP, which is KOKO. The LoA received from the host country is also entitled to KOKO/44/. In line with para 35, PS for PoA version 2.0/4/, The CME has provided a no ODA declaration letter/24/ confirming that no public funding has been received from any Annex I countries. 2. The information was also checked and found to be in line with the CDM-PoA-DD-FORM template guidelines/8/. 3. All the quotes with data and assumptions from published articles were also checked with the referred documents/18,25,26/ and found to be correct. Thus, it can be confirmed that the description of the PoA presented under section A of the PoA DD/1/ is accurate and complete.
Findings	CAR#07 and CAR#10 were raised and resolved.
Conclusion	The DoE confirms that the description of PoA is accurate and complete and the process undertaken to validate the accuracy and completeness of the description is written above. Thus, the requirements of para 38-43, VVS of PoA version 2.0/5/ have been fulfilled.

D.1.3.Management system

Means of validation	The coordinating/managing entity has established the operational and management system for the implementation of the proposed CDM PoA in line with PS for PoA version 2.0, para 36 and 37/4/. The CME of the PoA is KOKO Networks Limited. The CME will either implement the

CPA itself or may contract a CPA implementer for implementation of CPA.

All CPAs will be centrally managed by the CME. Review of PoA-DD/1/ and interview with CME management confirmed the same.

The PoA aims to disseminate bio-ethanol stoves to both households and SMEs. The end users are informed about the product (bio-ethanol cookstove) through the advertisements and demonstrations of stove use at the local shops. The demonstrations are done by local KOKO agents. These agents may be the shop owners where the KOKO fuel ATMs are installed also known as KOKO points. The template for the agreement between the Agent and KOKO was checked to understand their involvement in the process/12/.
The interested end users may register themselves using the interface of KOKOpoints (fuel ATMs) installed at local shops or "myKOKO" mobile application (https://play.google.com/store/apps/details?id=com.kokonetworks.mykoko). The end users directly register themselves by adding their details Name, phone number, address etc. on the interface after which they receive an auto generated message to confirm their purchase request. Post registration, the stove can be purchased through KOKO ATMs (cloud-connected fuel points) or the mobile app by the end users. The fees payment will be done directly through online mobile money transfer application "M-PESA" integrated with "mySafricom" mobile application (https://play.google.com/store/apps/details?id=com.selfcare.safaricom). The final product is only released for the end user when the product fees is received by KOKO. Post payment, the cookstove can be collected by the end-user from the nearest KOKOpoint by displaying the confirmation OTP received by end-user from KOKO. The date of collection is registered as the date of installation of the stove. Thus, avoiding false entries in the database for any name that does not actually possess the stove. All stoves will have a unique ID on it which will be linked to the registration details of the end-user. All the information of each buyer is automatically saved on the database. The sales database template/40/ was checked to confirm this. Thus, the database management system was found to be highly robust.

Roles and responsibilities:
The CME will either implement the CPA itself or may contract a CPA implementer for implementation of CPA. The KOKO members were interviewed during the site visit to confirm the roles that would be assigned to the CPA implementer.

Records of arrangements for training and capacity development for personnel:
The manufacturing team, testing teams working operation labs, monitoring teams are trained directly by the CME. CME representatives were interviewed during the site visit to corroborate these roles. Annual training schedules/35/ were also shared by the CME to ascertain that trainings will be conducted regularly and records for the same will be maintained.

A procedure for technical review of inclusion of CPAs
The internal technical review of the inclusion of CPAs would be done by the CME.CME representatives interviewed during the site visit ascertained that CDM program manager will conduct technical review and submit the reports to the CEO for approval. Appropriate measures are incorporated in the process to ensure independence of the review process.

A procedure to avoid double counting:
The list of the PoAs in the host country with cookstove dissemination as checked from the UN website are:

S. No.	PoA (Registered/under Validation)	Similarity or Difference with proposed CDM PoA
1.	Efficient Cook Stove Programme: Kenya	Different fuel type: woody biomass and applies AMS-II.G.

	PoA 5336	
2.	Improved Cooking Stoves Programme of Activities in Africa PoA 5341	Different fuel type: woody biomass and applies AMS-II.G.
3.	Improved Cook Stoves for East Africa (ICSEA) PoA 7014	**Same fuel type: Bioethanol and applies AMS-I.E. and AMS-II.G.**
4.	BioLite Improved Cook stoves Programme PoA 7997	Different fuel type: woody biomass and applies AMS-II.G.
5.	Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited PoA 8438	Different fuel type: woody biomass and applies AMS-II.G.
6.	Top Third Ventures Stove Programme PoA 9265	Different fuel type: woody biomass and applies AMS-II.G.
7.	Kenya Improved woodstoves project PoA 9384	Different fuel type: woody biomass and applies AMS-II.G.
8.	MicroEnergy Credits: Microfinance for Clean Energy Product Lines in Africa PoA 10341	Different fuel type: woody biomass and applies AMS-II.G.; AMS-III.AR.; AMS-III.AV.
9.	**PoA for the Reduction of emission from non-renewable fuel from cooking at household level** **PoA 7359**	**Same fuel type: Bioethanol and applies AMS-I.E.**

***PoAs under validation:**

No new PoA under validation in the same host country i.e., Kenya, was found on UNFCCC website:
https://cdm.unfccc.int/ProgrammeOfActivities/Validation/index.html

There are PoAs which has exactly same resource type in Kenya.
Thus, the conditions in 166(a-c) of PS for PoA version 2.0 are not met. However, as per para 168 of PS for PoA version 2.0/4/, other means can also be used to confirm that the project will not lead to discontinuation of the former projects.

The PoA has following provisions to avoid double counting:

1. The CME's team will record the baseline appliance, replacing KOKO stoves, at the time stove dissemination. The information has been added under

	CPA implementation process, page 10 of the PoA DD/1/. 2.The CME will also monitor through physical inspection during periodic sampling surveys if the HHs own any stove from other PoA. Furthermore, the team reviewed the capital investments data on cooking stoves/64/. The cost of any improved stove in the same geographical boundary ranges from $4-$43 as confirmed from /64/. The KOKO stove is a high priced project with market price 69.99USD/65/. Due to the high price of the project stove, it is highly unlikely for a consumer already owning a stove to buy such a product. The CPA DDs/36/ of this PoA were reviewed to identify that the cookstoves registered under the CPAs of PoA 7359 will not be having the smart chip technology. Furthermore, the stoves to be disseminated under the current PoA will also have a KOKO logo differentiating it from the other stoves. The UN website/42/ was also reviewed to confirm that the same CME does not have any other PoA or CPA already registered. The validation team confirmed that the CPAs under the PoA are not going to lead to discontinuation or modification of other existing CPAs in the same geographical boundaries. **Records and documentation control process for each CPA under the PoA** Records and documentation of each CPA will be archived for two years after the end of the final crediting period or the last issuance of CERs, whichever occurs later. **Measures for continuous improvements of the PoA management system** The CME plans to conduct annual management review meeting to assess overall performance, competencies and document control process and apply any scope of improvement if identified.
Findings	CAR#10 was raised and resolved.
Conclusion	The DOE confirms that the management system described in the PoA DD/1/ is in accordance with the CDM PS for PoA version 2.0, para 36/4/, and the coordinating/managing entity has the competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria for inclusion of CPAs in the proposed CDM PoA before its inclusion as per 37of PS for PoA version 2.0/4/.

D.1.4.Demonstration of additionality of PoA

Means of validation	The CME has applied 'Tool 19: Demonstration of additionality of microscale project activities, Version 08.0'/13/ to demonstrate additionality. The tool is valid till 28/11/2018. However, the request for registration can be submitted till 26/07/2019 as checked from the UNFCCC website/43/. Para 8(c.) of the tool/13/ states that the Project activities up to five megawatts that employ renewable energy technology are additional if following condition is true: The project activity is designed for distributed energy generation (not connected to a national or regional grid) with both conditions (i) and (ii) satisfied; (i)Each of the independent subsystems/measures in the project activity is smaller than or equal to 1500 kW electrical installed capacity; -The rated thermal output of the bio-ethanol stove disseminated under the project is 2.1kW(for two burner stove, it is 2.1*2= 4.2kW) as checked from the manufacturer's specifications/10/. (ii)End users of the subsystems or measures are households/communities/small and medium enterprises (SMEs);

	The CME representatives interviewed confirmed that they are aiming to disseminate the stoves to low-income households as well as institutions including small-scale industries and commercial set ups like catering services, street food outlets and restaurants. Additionally, these two criteria have also been added under eligibility criteria to of the CPA.
Findings	No findings.
Conclusion	The DOE is in opinion that CPAs under the PoA will demonstrate that independent subsystems/measures in the project activity is smaller than or equal to 1500 kW electrical installed capacity and the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) to demonstrate additionality. This has been also set as an eligibility criterion condition to be met by a CPA in order to get included in this PoA.

D.1.5.Start date and duration of PoA

Means of validation	The CME has chosen to determine the start date of the PoA as publication date of PoA DD in accordance para 48 of VVS for PoA/5/.The CME has determined the start date of the PoA to be the publication date of the PoA-DD for global stakeholder consultation as per the CDM Glossary terms version 09.1, page 20/7/. The publication date was confirmed from the CDM UNFCCC website/6/ and found to be 16/01/2019. The duration of the proposed CDM PoA is 28 years, 0 months. The start date of the PoA is 16/01/2019 which is the date of publication of PoA DD/1/, thus meets the requirement of para 41 of PS for PoA version 2.0/4/.
Findings	CL#02 was raised and resolved.
Conclusion	The DOE confirms that the start date and duration of the proposed CDM PoA comply with para 40-43 of PS for Po A ver 2.0/4/.

D.1.6.Environmental impacts

Means of validation	National Environment Management Authority, Kenya (NEMA) /27/ prescribes mandatory requirement of Environmental Impact Assessment (EIA), necessary for any project to be implemented in Kenya. However, dissemination of ethanol cookstoves is not listed as any of the 15 sectors that requires EIA. The stove under the project activity also complies with all the safety norms of the country/17/ and uses bio-ethanol fuel which is a renewable fuel which does not emit any toxic or harmful waste during combustion. CME has demonstrated at PoA level that the EIA is not needed for the PoA.
Findings	No findings.
Conclusion	The PoA does not fall under the purview of EIA and does not involve any activity that impacts the environment adversely.

D.1.7.Socio-economic impacts

Means of validation	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

D.1.8.Local stakeholder consultation

Means of validation	The Local stakeholder consultation was carried out for the whole PoA. The CME has conducted the LSC on 20/12/2018 as checked from LSC attendance sheet and LSC photos/28/. the date was also confirmed from the attendees present at the consultation. The LSC has been conducted at PoA level, which is clearly specified under section F of the PoA DD/1/. List of invitees/29/ and Attendance list/37/ were checked to ascertain that relevant stakeholder were part of the LSC: •Representatives of local, county and national government agencies relevant

	to the project •Kenyan citizens impacted by the project or official representatives •Kenyan and international non-governmental organizations (NGOs) working on topics relevant to your project •The local DNA representative The CME invited the minimum relevant local stakeholder referred in para 54 of PS for PoA version 2.0/4/. In line with para 55, PS for PoA, version 2.0/4/, the CME has provided evidence to confirm that the relevant stakeholders were invited through notice published in local newspaper/14/, public notice/14/, online announcement on the website/15/ and emails/16/. A Kenyan citizen, local DNA representative and a representative from clean cookstove association of Kenya were interviewed during the site visit. All the interviewed people confirmed that the CME team presented the details of the project in the form of videos and presentation/29/ which were clear and explicable. They also confirmed that no negative comments were raised by the attendees and all the queries related to the process were answered adequately and there are no host party rules applicable on LSC. The DNA representative interviewed also confirmed that no complaint has been received from the local stakeholder. Summary report of queries raised/29/ has been submitted by the CME, which was reviewed to confirm that all the questions had been answered appropriately and no negative comments from local stakeholder had been received. The presentation and videos/29/ shown to the stakeholder were scrutinized to confirm that it includes: (a) A summary of the proposed CDM PoA, explaining the PoA in simple, non-technical terms, and containing a description of the direct positive and negative impacts; (b) Information on the projected scope, lifetime, and direct positive and negative impacts of the proposed CDM PoA; (c) Other relevant information about the proposed CDM PoA, taking into account confidentiality provisions of the applicable CDM M&P above; (d) The means to provide comments about the proposed CDM PoA. There are no significant changes made to the PoA DD which might impact the scope of the local stakeholders engaged. The comments received through the LSC were mere inquisitive in nature and are still valid. The LSC was conducted on 20/12/2018 before the date of submitting the PoA DD (05/01/2019) to the DoE/37/ in line to para 64 of PS for PoA version 2.0/4/. LSC report/29/, interviews with local stakeholder, evidence for means of invitation/14,15,16/, photos/28/, attendance sheet/37/ were used as the means to confirm that the LSC has been conducted adequately. Thus, the validation team confirms that the conduction of consultation has been done in accordance with the relevant requirements in the “CDM project standard for programmes of activities”.
Findings	No findings.
Conclusion	The DOE confirms that the LSC was conducted in accordance with section 7.8 of the PS for PoA version 2.0/4/.

D.1.9.Sustainable development co-benefits

Means of validation	Not Applicable
Findings	Not Applicable

Conclusion	Not Applicable

D.1.10.Approval

Means of validation	Kenya has been indicated as the party involved in the PoA DD/1/. The CME has submitted the LoA/44/ received from the DNA of Kenya (National Environment Management Authority)/45/, The LoA/44/ confirms that: (a) The Party is a Party to the Kyoto Protocol; (b) The participation in the PoA is voluntary; (c) the PoA contributes to achieving the sustainable development of the country; (d) It refers to the precise title of the PoA in the PoA-DD being submitted for registration. The LoA/44/ received is unconditional with respect to para 69a-c of PS for PoA version 2.0/4/ and is valid for the proposed CDM PoA under validation.
Findings	CL#01 was raised and resolved.
Conclusion	The CME has received LoA/44/ from the DNA of the Host Country/45/ of the PoA. The LoA/44/ meets the requirements of section 7.11.1 of VVS for PoA/5/.

D.1.11.Authorization

Means of validation	The CME (KOKO networks) has been authorized to coordinate the proposed CDM PoA by the host party (Republic of Kenya) as checked from the LoA/44/. DOE confirms that 1. the coordinating/managing entity and the project participants of the proposed CDM PoA are listed in the PoA-DD/1/ and authorized by the DNA to implement the PoA. The information is consistent with the information provided in the Appendix 1 of the PoA DD/1/, that contains the contact information of the coordinating/managing entity. 2.no entities other than those authorized as the coordinating/managing entity and the project participants of the proposed CDM PoA are included in the above referred section of the PoA-DD/1/. The participation of CME has been authorized by a party to the Kyoto Protocol and the authorization has been issued from the relevant DNA/45/.
Findings	CL#01 was raised and resolved.
Conclusion	The CME has received LoA/44/ from the DNA of the Host Country of the PoA. The LoA/44/ meets the requirements of section 7.11.2 of VVS for PoA/5/.

D.1.12.Modalities of communication

Means of validation	MOC statement has been correctly completed using the latest MOC FORM template/31/. The DOE has reviewed the MOC form/30/ and confirms that: (a) The valid version of the form “Modalities of Communication statement” (CDM-MOC-FORM) has been used; (b) The information required as per the CDM-MOC-FORM, including its annex 1, is correctly completed; (c) The project participants’ authorized signatories signing the CDM-MOC-FORM correspond to the project participants’ authorized signatories included in the CDM-MOC-FORM, annex 1. The CME has submitted a written confirmation/39/ that all corporate and personal details are authorized by CME to be focal points. The validity of the specimen signatures was checked from the photo ID cards of the focal points/38/.
Findings	CL#01 was raised and resolved.
Conclusion	The DOE confirms that the MoC statement was completed and duly authorized in accordance with the valid version of the form and the information required therein

D.1.13.Global stakeholder consultation

Means of validation	The PoA DD was made public for a period 16/01/2019-14/02/2019 on CDM UNFCCC website/6/. No comments have been received during the period.
Findings	No findings
Conclusion	The PoA DD has been made public by the validating DOE as per para 10 of PCP for PoA version 2.0/4/ for a period of 30 days. However, no comments have been received during the consultation period.

D.2.Generic component project activities

D.2.1.General description of generic CPA

Means of validation	The CME has described the generic CPA in the CPA DD in line with para 81 of PS for PoA version 2.0/4/. The purpose of the generic CPA is to disseminate bioethanol stove which enables switch from non-renewable biomass to renewable biomass. CME has indicated under section H.3. and I.2. of the generic CPA DD that the generic CPA is type I. The generic CPA was found to meet requirement of para 126(a) of PS for PoA **The technologies to be employed:** The bio-ethanol stove to be disseminated under the CPA is a two-burner ethanol stove along with a 'smart' canister equipped with an NFC chip. These cannisters avoid misuse of the fuel as well it helps in tracking of household-level fuel purchases. KOKO has installed several cloud-connected KOKO ATMs at local corner shops, which has increased the accessibility and affordability of Bioethanol as a fuel. The fuel can only be bought/refilled in a smart cannisters received with the KOKO stove. All the components were corroborated through visual observations during the site visit. Technical details of the stoves as corroborated from manufacturer's specifications/10/: 5. Stove Efficiency: 60% as corroborated from the manufacturer's specifications. 6.The average lifespan of the stoves is expected to be 10 years. 7. Thermal output 2100W (~2.1 kW)- (For two burner stove- 2.1*2 =4.2 kW) 8.Other design details like fuel capacity, burn time, compliance with Kenyan Standard KS-2759 for ethanol appliances, dimensions and design highlights of the smart cannisters. **Technologies/measures existing prior to the implementation of the corresponding CPAs:** The households in the planned areas were visited and found to use charcoal and fuelwood as a fuel on traditional charcoal stoves. **Baseline scenario:** As per para 19 of the applied methodology/2/, it can be assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. Please refer to D.2.2.5. of this report for detailed assessment of baseline scenario. The unique features of the stoves like use of bio ethanol and digital enabled infrastructure makes the PoA distinct than the other PoAs in the country. The CME has demonstrated under H.3.of the PoADD how the project will not lead discontinuation of CDM activities.
Findings	CL#02, CL#03 were raised and resolved.
Conclusion	The assessment team confirm that the description given in the generic CPA DD/1/ is accurate and complete inline to para 90-91, VVS for PoA, version 2.0/5/.

D.2.2.Selection of methodologies and standardized baselines

D.2.2.1.Deviation from methodologies and/or methodological tools

Means of validation	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

D.2.2.2.Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

D.2.3. Application of methodologies and standardized baselines

D.2.3.1.General

Means of validation	**Applicability Condition of AMS-I.E**	**DoE Assessment**
	1.This methodology comprises of activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, bio-ethanol stoves, solar cookers, passive solar homes	The PoA aims to distribute bio-ethanol stoves for cooking, as checked through visual observation on-site. Since the bio-ethanol fuel is classified as renewable fuel, the implementation of project activity is found appropriate. The CME will sign a framework agreement with the fuel marketing company(VIVO energy), which has fuel protocol prohibiting the to procurement of synthetic ethanol, thus only allowing the use of bioethanol. Clauses of the protocol/50/ were checked to confirm this. According to the protocol, an independent analyst hired by the CME and FMC will test the fuel against the supplier's Certificate of Quality and will verify the chain of custody documents. This will ensure the fuel tracability till the bioethanol production site. Once the fuel is found to conform to the standards defined in Bioethanol Product Specifications/51/, only then the fuel will be approved for further distribution. This will ensure only bioethanol is used in the stoves under PoA. The type of stoves included will also be checked at CPA level and it has been added as an eligibility criterion under section K of generic CPA DD/1/.
	2.Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics	Energy and Development in Kenya – Opportunities & Constraints, The Beijing Institute & The Royal Swedish Academy of Sciences Stockholm, Sweden/32/ was reviewed to study the use of fuelwood and charcoal to meet non-commercial energy demand since 1980. It confirmed that Republic of Kenya has been primarily dependent on fuelwood and charcoal for household energy use long before 1980. Furthermore, the consumption of non-renewable biomass as the primary household

		fuel till date has been verified from the baseline analysis of the National Climate Change Action Plan 2013-2017/33/ and Second National Communication to UNFCCC/34/. Thus, the applicability criterion was found to be met.
	3.The methodology is applicable for technologies displacing use of non-renewable biomass by renewable energy	The PoA aims to distribute bio-ethanol stoves for cooking, as checked through visual observation on-site. The use of bioethanol stove requires bio-ethanol fuel as fuel which is classified as renewable fuel, the implementation of project activity is found appropriate. Thus, the project will displace the use of non-renewable biomass by renewable biomass. The type of stoves included will also be checked at CPA level and it has been added as an eligibility criterion under section K of generic CPA DD/1/.
	4.Project participants or coordinating and managing entities shall describe in the PDD/PoA-DD how the double counting of emission reductions has been addressed (e.g. between end users, distributors and producers of stoves)	It was confirmed through onsite interviews and demonstration of end user registration shown by the CME that following factors will aid the CME to avoid double counting: 1.The CME collects all the data for each user through digital platform connected to all users via mobile network. There can be only one stove bought for one mobile number. 2. A unique number is allotted to the product at the time of purchase. 3. The price of the stove in comparison to other stove in the market is high. It is highly unlikely that one household would be able to afford more than one stove. 4. The stoves installed under the project have NFC smart chips, which makes it differentiable than other project stoves/10/. Thus, it can be ascertained that the chances of double counting are low.
	2.For project activities introducing bioethanol cookstoves project participants or coordinating and managing entities shall demonstrate that the bioethanol cookstoves are designed, constructed and operated to the requirements (e.g. with regard to safety) of a relevant national or local standard or comparable literature. Latest guidelines issued by a relevant national authority or an	Kenya Standard KS 2759/17/ covers the requirements for ethanol fuelled appliances for cooking and heat generation in households. The details of KOKO stove were checked from the manufacturer's specifications/10/ and found to comply with standard/17/.

	international organisation may also be used.
Findings	CL#04 was raised and resolved.
Conclusion	DOE confirms that the generic CPA meets all the applicability conditions of the applied methodology AMS-I.E. version 9.0/2/.

D.2.3.2.Project boundary, sources and GHGs

Means of validation	As per para 12 of the applied methodology AMS-I.E. version 9.0/2/, the generic CPA project boundary is the physical, geographical site of the use of biomass or the renewable energy. The physical boundary will include various regions of Kenya, where the stove will be disseminated. The project boundary was checked during the on-site visit to the project location to confirm that CME will disseminate the stoves only within the geographical boundary of Kenya. The boundary has been defined in accordance with the selected methodology/2/. Since project emission described in the applied methodology/2/ also includes activities other than the use of biomass, hence the DOE has also assessed those activities under Project emissions. Project Emissions include use of non-renewable biomass for cooking in household/institutions/SMEs and Energy Consumption associated with Production of Feedstock/ renewable fuel and its distribution (bioethanol). The project emissions are discussed in detail under section D.2.3.4 of this report. The GHG source in the baseline scenario is the use of non-renewable biomass in traditional cooking. In the project scenario, sources of the GHG considered are only from the combustion of non-renewable biomass (in case the end user continues to follow old measure after project implementation). An adjustment factor has also been applied to account for leakages. The validation team did not identify any emission sources that will be affected by the implementation of the CPAs to be included and which are expected to contribute more than 1% of the overall expected average annual emission reductions, that are not addressed by the selected approved methodology/2/.
Findings	No findings.
Conclusion	The spatial extent of the generic CPA boundary, which is the geographical boundary of Kenya, is clearly defined in the generic CPA-DD/1/ and is in line with AMS-I.E. Version 09/2/. The greenhouse gases and emission source included in the generic CPA boundary both in the baseline & project scenario, is CO_2.

D.2.3.3.Baseline scenario

Means of validation	The validation team reviewed National Economic Survey 2018/18/ and concluded that the CME has interpreted correctly that the Main source of fuel used for energy consumption is wood fuel (Firewood and Charcoal). The statements quoted from Second National Communication to UNFCCC/34/ were also checked to corroborate that the energy demands of the households are met by wood fuel and it has led to problems like deforestation. The other sources of fuel are LPG, Kerosene, Electricity and Renewable Biomass. As per the National Economic Survey/18/ the percentage of energy consumption from all these sources are less than 5%. Moreover, the households located in the planned areas of distribution were visited during the site visit. The households were found to use charcoal(non-renewable) and fuelwood as the fuel. The household owners also said that the LPG is available in the market, but they have not been able to use it due to high prices. Thus, it can be ascertained that in absence of the PoA, the households will use non-renewable biomass in traditional stove

	Para 19, of the applied methodology AMS-I.E., version 9.0/2/ states that the baseline scenario, in the absence of the project activity, would be the use of fossil fuels for meeting similar thermal energy needs. The baseline scenario for SMEs is use of woody biomass to meet the similar thermal needs. The demonstration of baseline scenario has been shown in detail under section I.5. of the PoA DD/1/. The figures for use of different fuel type and their percentage stated on page 23 of the PoA DD/1/ were checked from Biomass fuel market study report/56/ and found to be correctly stated. The review of the document confirmed that charcoal is the mainly used fuel in Kenyan SMEs. This was further corroborated by interviews with local street food vendors conducted by the validation team. Thus, based on review, it can be concluded by the validation team that the baseline scenario has been established in line with the applied methodology/2/. The documents and sources referred to in the PoA DD/1/ are correctly quoted and interpreted. The validation team cross-checked the information provided in the PoA-DD/6/ with other verifiable and credible sources. The validation team, drawing on its knowledge of the sector and/or advice from local experts, confirms that all applicable CDM rules and requirements have been taken into account in describing the identification of the baseline scenario for the generic CPA, as well as relevant national and/or sectoral policies, regulations and circumstances have been taken into consideration. Several energy policies/20-23/ to the proposed PoA were reviewed such as: 1.The Energy Act 2006: National policy and strategy document for short to long-term energy development in Kenya 2.Feed-in Tariff Policy 2008: Development of electricity generation projects from renewable sources 3.The Energy (Energy Management) Regulations 2012: Promotion of Energy Management and Conservation in Kenya 4.The Energy Bill 2017: National Integrated Energy Policy However, the policies do not qualify as E+ or E- policy as per PS for PoA version 2.0,para 105 and 106/4/, thus they have not been considered.
Findings	CL#02 and CAR#10 were raised and resolved.
Conclusion	The DOE confirms: (a) All the assumptions and data used by the coordinating/managing entity are listed in the generic CPA-DD/1/, including their references and sources;(b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the generic CPA-DD/1/; (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable; (d) Relevant national and/or sectoral policies, regulations and circumstances are considered and listed in the generic CPA-DD/1/; (e) The methodology/2/ has been correctly applied to describe identification of the most plausible baseline scenario and the description reasonably represents what would occur in the absence of corresponding CPAs (to be included).

D.2.3.4.Estimation of emission reductions or net anthropogenic removals

Means of validation	**Calculation of baseline emissions:** The validation team has checked the modalities for ex-ante calculation stated under section I.6.3. of the generic CPA DD/1/. The assessment team is of an opinion that the all the equations listed in the generic CPA DD/1/ have been sourced directly from the applied methodology/2/ and thus, are in compliance with it. The equation

being used are as follows:

$BE_y = B_y * f_{NRB} * NCV_{biomass} * EF_{projected}$ ……(1)

Where:

BE_y	Baseline emissions during the year y in t CO2e
B_y	Quantity of woody biomass that is substituted or displaced in tonnes
f_{NRB}	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass (fNRB)
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne)
$EF_{projected\_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 t CO2/TJ

For households, following equations would be used:
$B_y = Np,HH * N_{HH} * (BC_{BL,PPy} – BC_{PJ,PP,y})$ ……(2)

N_{HH}	Number of households in the project activity, number
$N_{p,HH}$	Average number of persons served per household prior to the project Implementation
$BC_{BL,HH,y}$	Average annual consumption of woody biomass per household before the start of the project activity, tonnes/household/year
$BC_{PJ,HH,y}$	If it is found that pre-project devices were not completely displaced but continue to be used to some extent, average annual consumption of woody biomass per household in the pre-project devices during the project activity, tonnes/household/yea

For institutions, following equation would be used:

$By = \sum_{i}^{n} HG_{SME} / (NCVbiomass * nold,i)$ ……(3)

Where:

HG_{SME} = Quantity of thermal energy generated by the new renewable energy technology in the project in year *y* (TJ)

$n_{old,i}$ = Efficiency of pre - project device per type of device *i*

Calculation of HG_{SME} is as follows:

$HG_{SME}=Q_{SME,Eth} * NCV_{Eth} * \eta_{Eth}$

Where:

$Q_{SME,Eth}$	Average daily consumption of bioethanol in a project cookstove (KOKO cooker) distributed to SMEs as part of the PoA/CPA
NCV_{Eth}	Net calorific value of the fuel type “i” used in project scenario including non-renewable woody biomass, charcoal or renewable bio-ethanol
η_{Eth}	Efficiency of bioethanol KOKO Cooker

Calculation of project emission:

Project emission due to biomass cultivation:

The project boundary is the physical, geographical site of the use of biomass or the renewable energy. So, the CPAs under the POA, the boundary would be sites were the project stoves are installed. Continued use of non-renewable biomass within the project boundary will be monitored through parameter BCPJ,PP,y and factored out already from the baseline emission as seen in equation (2) above.

As described under section D.1.2. of this report, the DOE confirmed that the bioethanol(biomass) production did not involve dedicated plantation and the bioethanol used under the PoA is sourced from the Molassess production unit, where bioethanol is produced as a by-product. Hence, the scenario of dedicated plantation is not considered to be applicable on this PoA.

Project emissions from the project activity have also been determined using para 22 of the applied methodology/2/:

a)CO2 emissions from on-site consumption of fossil fuels due to the project activity, calculated using the latest version of "TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" The biomass(bioethanol) produced does not undergo any further processing under the PoA and used as a fuel in the same form as it is taken from the source.

The only point of fossil fuel consumption in the PoA is transportation and storage of fuel. The storage of the fuel does not lead to emission and the emission related to transportation are discussed below.

b)CO2 emissions from production of bioethanol- since the tool referred in the methodology does not prescribe a method to calculate this if the production is not under the control of CME. The CME has determined a value of emission factor for 1L of bioethanol production based on the published study report/48/. The sourced were verified and found to be reliable. The project emissions would be calculated based on the amount of bioethanol consumed multiplied with the specific CO2 emissions due to the production of bioethanol. Please refer to parameter $\mathbf{EF_{bioethanol\_production}}$, below.

c) Emissions from electricity consumption: The only source of electricity consumption in the PoA is operation of display screen at KOKOpoints. It was confirmed through interviews and on-site inspection of the distribution chain that there was no other source of electricity consumption in the PoA. The project emissions associated with electricity consumption at KOKO points will be monitored continuously as per the applied methodology/2/, which has been discussed in detail in section D.2.3.5., parameter $\mathbf{EC_{PJ,j,y}}$.
Following formula would be used to determine the $PE_{EC,y}$

$$PE_{EC,y} = \sum EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})$$
$$= N_{KP} \times EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})$$

$PE_{EC,y}$ - Project emissions from electricity consumption in year y (tCO2/yr)
N_{KP} – Number of KOKOpoints installed under the project activity
$EC_{PJ,j,y}$ - Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr); monitored ex-post
$EF_{EC,j,y}$ - Emission factor for electricity generation for source j in year y (t CO2/MWh); A conservative default value of 1.3 tCO2/MWh is used,

according to option A.2 (a) of the tool, since only project emissions are calculated and not baseline emissions.

$TDL_{j,y}$ - Average technical transmission and distribution losses for providing electricity to source j in year y; A conservative default value of 20% is used, according to option parameter/data table 3 of the tool, since leakage emissions are calculated.

The parameters are discussed in detail below.

d)Emissions from transport: The data for the key bioethanol producing sites was verified from Baseline Report of Clean Cooking Fuels in the EAC by GAIA/47/. The key production site was found to be western belt of Kenya. It was also observed from the population density maps of Kenya/61/, link for which is provided in the PoA-DD/1/, that there are two major regions in the country with high population density i.e. western belt region and Nairobi. Therefore, the distance between the production sites and key destinations was calculated in order to estimate the average distance, which was also assessed indipendently by the validation team using google maps/66/ and was found to be accurate. The average distance was calculated considering the population factor across the western belt region and Nairobi region/61/. The distance was found to be 135 kms, which is less than 200kms as demonstrated in the PoA DD/1/. All the values used to determine the average distance were found to be correct and justified, and the approach was found to be conservative. However, the CME has conservatively accounted for the transport emissions associated with fuel distribution to KOKOpoints. Average distance for each round trip made by the vehicles from fuel depots to KOKOpoints would be calculated. This will be used to find out the total distance traveled by vehicles throughout the year by multiplying the distance obtained with total number of trips made, which will be monitored. The approach was found to be in line with applied methodology AMS-I.E. version 9/2/ and has been discussed in section D.2.3.5.

Following formula would be used to determine $PE_{TR,m}$

$$PE_{TR,m} = \sum D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6}$$

Where:

$PE_{TR,m}$ = Project emissions from transportation of freight monitoring period m (t CO2)

$D_{f,m}$ = Return trip distance between the origin and destination of freight transportation activity f in monitoring period m (km)

$FR_{f,m}$ = Total mass of freight transported in freight transportation activity f in monitoring period m (ton)

$EF_{CO2,f}$ = Default CO2 emission factor for freight transportation activity f (g CO2/t km)

Calculation of leakages:

The CME has applied a gross adjustment factor of 0.95 as an alternative to leakages stated in para 34(a) and (b). The approach was found in line with the applied methodology.

Ex-ante parameter:

Parameter	Means of validation
f_{NRB} *(Fraction or %)*	The CME will determine the value of

	Fraction of woody biomass saved by the project activity during year *y* that can be established as non-renewable biomass	the parameter by using any one of the following options **at the CPA level**: •Country specific default values suggested by the CDM EB / DNA; •Default Values of Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, Information Note – SSC WG 35 meeting report Annex 20 (approved in EB 67, Annex 22) •Calculated as per Tool: Calculation of the fraction of non-renewable biomass, EB 97, Annex 9 The approach was found to be in line with the applied methodology/2/.
	$NCV_{biomass}$ (TJ/Tonne) Net calorific value of biomass displaced by the project activity	The value of the parameter is 0.0156 for wood and 0.0295 for charcoal, is sourced from the applied methodology/2/.
	EFprojected (tCO_2e/TJ), Emission factor for the substitution of non-renewable woody biomass by similar consumers	The value of the parameter is 63.7, sourced from the applied methodology/2/.
	LAFy, (Fraction), Leakage adjustment factor	The value of the parameter is 0.95, is sourced from the applied methodology, page 8/2/.
	$BC_{BL,PP,y}$ (tonnes/person/year) Average annual consumption of woody biomass per person before the start of the project activity	The CME will determine the value of the parameter by using any one of the following options **at the CPA level**: •Historical data or published data;" •Country or region specific values approved through the "procedure for development, revision, clarification and update of standardized baselines," which are available on the CDM website The approach was found to be in line with the applied methodology/2/.
	Np,HH(Number), Average number of persons served per household prior to the project implementation	The value of the parameter will be determined at CPA level by sourcing data from published information / literature defining the average household size in the project region for the initial CPAs. The same value can be used by the subsequent CPAs, instead of fresh assessments in absence of new data. The approach was found to be in line with the applied methodology/2/.
	$EF_{bioethanol\_production}$, Project Emission Factor for production of bioethanol	The value of this parameter is 8.73g CO2/Litre which has been sourced from Published Life Cycle Assessment Report "Lifecycle Greenhouse Gas

	Emissions and Energy Balances of Sugarcane Molasses-Based Bioethanol in Kenya"/48/. The source was found to be reliable and the value was found to be appropriate.
η_{Eth}, % Efficiency of bioethanol KOKO Cooker	The value of this parameter is 60%, the source of which is tested efficiency as per international standards as checked from the manufacturer's specifications/10/.
Emission factor for electricity generation for source j in year y, $EF_{EF,j,y}$, tCO_2/MWh	The value of the parameter is 1.3 tCO2e/MWh, a default value sourced from the applied Tool 5: Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation Version 03.0/57/.
Average technical transmission and distribution losses for providing electricity to source j in year y, TDL, %	The value of the parameter is 20%, a default value sourced from the applied Tool 5: Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation Version 03.0/57/.
$\eta_{old,i}$, % Efficiency of baseline appliance being replaced	The CME will determine the value of the parameter by using any one of the following options at the time of **first CPA inclusion**: **Default Approach**: A default value sourced from the applied methodology for Efficiency of 0.1 can be used for a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; For all other types of devices, a default value of 0.2 shall be used **Survey Approach**: The other option to determine the value of the parameter could be by conducting a survey of SMEs before implementation of the PoA to calculate the average efficiency. The approach was found to be in line with the applied methodology/2/.
$EF_{CO2,f}$, gCO2/t km Default CO2 emission factor for freight transportation activity f	The value of the parameter is 245 gCO2e/km for light vehicles and 145 gCO2e/km for heavy vehicles, default value sourced from the applied Tool 12: Methodological tool: Project and leakage emissions from transportation of freight /63/.

The ex-post parameters used in the equation above have been assessed profoundly under the next section.
Sampled calculation has been presented in the generic CPA-DD/1/ under section

	I.6.3. by applying assumed values for single stove, clearly explains the equations.
Findings	CAR#05 and CAR#10 were raised and resolved.
Conclusion	It has been confirmed that the modalities for ex-ante calculation of emission reductions has been found to be satisfactory demonstrated in the generic CPA DD/1/and confirms that the formulas stated above are in line the applied methodology/2/

D.2.3.5.Monitoring plan

Means of validation

Monitoring plan:

All the parameters required by the applied methodology/2/ were identified and listed below:

Ex-post parameters:

Parameter	Means of validation
D_i, Date of commissioning of project device I (date), Actual date of commissioning of project device	The PP will record each sale in sales database/40/ along with the name of recipient, contact details, location of household (village, district etc) at the time of installation to monitor this parameter. The parameter will be used for calculating $Stove_{Year}(i)$, fraction of year(s) the cookstove i was operational during the monitoring period which is applied for baseline emission calculation. The PP has applied following formula: $Stove_{Year}(i)$ = Maximum of { (End-Date of Monitoring Period – Di, Date of Commissioning of Project Device) AND (End-Date of Monitoring Period – Start-Date of Monitoring Period) } / 365 The formula determines the fraction of year for which a stove is active./.
N_{HH}(Numbers) Number of project devices of type i and batch j operating during year y	The number of stoves will be determined through online sales database and number of samples operational and total will be determined through survey. The parameter shall be monitored at least once in two years following the sampling requirements set as per the "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/.
$BC_{PJ,PP,y}$, (Tonnes/persons/year) Average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that pre-project devices were not completely displaced but continue to be used to some extent	Average annual consumption of woody biomass per household will be determined through project monitoring survey. The parameter shall be monitored at least once every two years following the sampling requirements set as per the "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/.
$Q_{HH,Eth}$ and $Q_{SME,Eth}$(Litres/day) Average daily consumption of bioethanol in a project cookstove	The parameter will be determined through project monitoring survey. The parameter shall be monitored at least

	(KOKO cooker) distributed to Households and SMEs as part of the PoA/CPA	once every two years following the sampling requirements set as per the "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/.
	$N_{I,I}$ (Number) Number of project devices of type i and batch j operating in institutions during year y	Number of project devices of type i and batch j operating in institutions during year y will be determined through sales database and project monitoring survey. The parameter shall be monitored at least once every two years following the sampling requirements set as per the "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/.
	$N_{KP,y}$ (Number) Number of KOKOpoints operating during year y	The parameter value will be determined by maintaining a database of installed KOKOpoints under operations. The parameter will be monitored continuously and the recorded annually.
	$NCV_{i,biomass}$ (TJ/tonne) Net calorific value of the fuel type "i" used in project scenario including non-renewable woody biomass, charcoal or renewable bio-ethanol.	The default parameter value for wood fuel and charcoal is 0.0156 and 0.0295 respectively, which is sourced from IPCC Guidelines for National Greenhouse Gas Inventories 2006/52/ and was found to be accurate. Parameter value for bioethanol will be monitored annually using project surveys.
	$EC_{PJ,j,y}$ (MWh/year) Quantity of electricity consumed by the project electricity consumption source j in year y	The parameter value will be determined by directly obtaining the value of electricity consumed from the electricity meters installed at all electricity consumption sources (KOKO points). The parameter will be monitored continuously and recorded at least monthly as per the requirements of tool 5 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"/57/ and applied methodology/2/.
	HG_{SME} (Tonnes of bioethanol/year/SME) Average annual consumption of bioethanol by an SME	The parameter value will be calculated based on the bioethanol consumption by an SME which is also a monitored parameter. The calculation procedure has been defined above. The quantity of bioethanol consumed is determined through project surveys for SMEs annually also discussed under the parameter head above. The survey will be conducted in line with "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/.
	$D_{f,m}$ (Kilometer) Return trip distance between the origin and destination of freight transportation activity f in monitoring period m	The parameter value will be obtained through vehicle records maintained by the operators or the project participant. The parameter will be monitored

	continuously, whenever the distance changes, as per the requirements of tool 12: : Project and leakage emissions from transportation of freight/63/.
$FR_{f,m}$, (Tonnes) Total mass of freight transported in freight transportation activity f in monitoring period m	The parameter value will be obtained through vehicle records maintained by the operators or the project participant. The parameter will be monitored continuously as per the requirements of tool 12: : Project and leakage emissions from transportation of freight/63/.

By reviewing and comparing the monitoring details of each parameter it was confirmed that the monitoring plan contains all necessary parameters and the means of monitoring described in the plan comply with the requirements of the applied methodologies.

The team leader has conducted the site visit to the project location to confirm that:
(i)The monitoring arrangements described in the monitoring plan are feasible within the project design;
(ii)The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that GHG emission reductions achieved by/resulting from corresponding CPAs to be included can be reported ex post and verified.

Sampling plan:
The CME will apply cross CPA sampling following the requirements of Standard: Sampling and surveys for CDM project activities and programmes of activities, version 7.0/9/.
The confidence/precision shall be met by the CME. In case, the desired precision is not met, the CME shall either use the lower bound value of the corresponding confidence or repeat/expand the survey.

As per para 22, Standard Sampling and surveys for CDM project activities and programmes of activities, version 7.0/9/, mandates application of 95/10 confidence/precision for CPAs solely composed of micro-scale CDM units hence the same shall be applied

Sampling methodology:
Stratified sampling will be carried out over the sampling frames of the target population (total population served under the PoA) to deduce the value of monitoring parameters.

Formulas stated in Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities/19/ and sampling approaches Standard: Sampling and surveys for CDM project activities and programmes of activities, version 7.0/9/ will be followed to determine the sample size. The formulas stated in the generic CPA DD/1/ are in line with the above stated guideline/19/.

Thus, it can be confirmed that the sampling plan provides the parameter value estimates in an unbiased and reliable manner, where the coordinating/managing entity has applied a sampling approach to determine data and parameters in accordance with the “Standard: Sampling and surveys for CDM project activities and programme of activities version 7.0/9/.

Other elements of the added monitoring plan:

- Specific sales database for each CPA to be included
- Single sample set will be drawn and required precision would be met
- Design of survey questionnaire will include only non-intrusive and easy to comprehend questions.

	•All the monitoring staff will be trained to perform their allotted task appropriately. •Third party will be checked for skills and experience. The elements outlined above comply with the applied methodology/2/ and PS for PoA version 2.0/4/
Findings	CAR#06, CAR#07, CAR#08, FAR#09 and CAR#10 were raised and resolved.
Conclusion	The DoE confirms that: (a)The compliance of the description of the monitoring plan stated in the generic CPA DD/1/ with the requirements of the applied methodologies AMS-I.E. version 9.0/2/ including applicable tools, and, the "Standard: Sampling and surveys for CDM project activities and programme of activities" version 7.0/9/; (b)The monitoring arrangements described in the monitoring plan are feasible within the project design The coordinating/managing entity has ability to implement the monitoring plan.

D.2.4.Crediting period type and duration

Means of validation	CME has selected fixed type (i.e. 10 years, 0 months) of crediting period. It would be ensured at the time of inclusion of CPAs that the CPAs do not exceed the end of the duration of the PoA.
Findings	No findings.
Conclusion	The CME has decided the crediting period and type as per para 122 of PS for PoA version 2.0/4/.

D.2.5.Eligibility criteria for inclusion of CPAs

No.	Eligibility criterion - Category/Required condition	Means of validation	Findings	Conclusion
1.	Geographic Boundary The cookstove under the CPA must operate within the geographical boundary of the PoA i.e. Republic of Kenya	Sales database listing all the installed ethanol cookstoves will be checked by the validation/verification team to confirm that the ICS are installed within Kenya.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(a)/4/. The criterion is is verifiable as well as sufficiently objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
2.	Double Counting Carbon emission reductions claimed by the CPA should be unique and not counted more than once	Each ethanol cookstove has a unique ID number which avoids double counting of the same ICSs. The unique id shall be checked by the team involved in inclusion of CPA.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(b)/4/. The criterion is is verifiable as well as sufficiently objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
3.	Exclusiveness of CPA The CPA shall not be previously: registered as a CDM project activity, included as a CPA in any other registered PoA, or deregistered as a CPA of a PoA	CME will check and confirm if the CPA is not a CPA in any other registered PoA or deregistered as a CPA of a PoA or already registered as a CDM project activity.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(c)/4/.
4.	Specifications of Technology/Measure The specifications of technology/measure including the level and type of service, performance specifications including compliance with	Technical description of the ethanol cookstoves shall be shared with the DoE involved in inclusion to confirm that •Thermal output of stoves is between 1.4kW and 1500 kW	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(d)/4/.

No.	Eligibility criterion - Category/Required condition	Means of validation	Findings	Conclusion
	testing/certifications	• Thermal efficiency of stove is more than 45% • The fuel used is bioethanol An internal approval will be taken from CME by the CPA implementer/fuel provider for the fuel type.		
5.	<u>Start date</u> Date on which first project stove was installed under the CPA. The start date of any proposed CDM CPA will be on or after the start date of the proposed CDM PoA	End user agreement / voucher / installation report will be checked as an evidence to validate the start date of the first cookstove at the time of inclusion of CPA.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(e)/4/.
6.	<u>Applicability of the methodologies</u> CPA must follow AMS.I-E ver 09.0. The applicability of methodology at CPA level has already been demonstrated in section D.2.2.1 above. Technology related requirements have been specified in criteria #3 above.	The generic CPA meets all the applicability criteria. The detailed assessment of which has been given under section D.2.2.1 of this report. The CPA to be included will also be checked for the same.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(f)/4/.
7.	<u>Additionality</u> Cookstoves shall be installed at households or SMEs The rated annual thermal energy savings of cookstoves included under the CPAs shall not be more than 1500 kW	The CPA to be included will demonstrate that the units disseminated have annual thermal energy saving of less than 1500 kW in order to be auto-additional.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(g)/4/.

No.	Eligibility criterion - Category/Required condition	Means of validation	Findings	Conclusion
8.	LSC and EIA The local stakeholder consultation is conducted at the PoA level (Section F of the PoA-DD). An environmental impact analysis is not required (section E of the PoA-DD)	LSC has been Conducted at PoA level while EIA is not required to be conducted. Please refer to section D.1.6 and D.1.8 of this report for detailed assessment of EIA and LSC.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(i)/4/.
9.	Public Funding Affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	CME will provide a declaration to confirm that the CPA has receive no ODA.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(j)/4/.
10.	Target Group and Distribution Mechanism Target Group: Households / SMEs Distribution Mechanism: Via local partners	It was confirmed though interview of the CME representatives and some households that the target group is households and SMEs and distribution is done by local partners. The same will be followed by each CPA to be included under this PoA.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(k)/4/.
11.	Sampling CPAs under the program will adhere to all requirements as mentioned in Standard: Sampling and surveys for CDM project activities and programme of activities	Sampling will be conducted by following the Standard: Sampling and surveys for CDM project activities and programme of activities version 7.0/9/. The detailed assessment of sampling plan is given above under section D.2.2.7 of this report.	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 124(l)/4/.
12.	SSC Threshold Not applicable	Not applicable	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 120(m)/4/ and meets condition.

No.	Eligibility criterion - Category/Required condition	Means of validation	Findings	Conclusion
13.	Debundling Check Not applicable	Not Applicable	No findings	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA are defined in accordance with the project standard for PoA, para 120(n)/4/.
14.	Approval of CPA by CME The CME approves each CPA to be included into its registered PoA after detailed technical review.	Statement of approval will be received and presented to DoE involved in inclusion.	No findings	This is an additional eligibility criterion added to ensure technical review of CPA, which is required as per para 36 (c) of PS for PoA version 2.0/4/.
15.	CER ownership End users receiving cookstove under the specific CPA cede their rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to the CME of the PoA.	End user agreement will be provided as an evidence to demonstrate that the criterion has been met.	No findings	This is an additional eligibility criterion added to ensure CER ownership by the CME.

SECTION E.Internal quality control

A draft validation report prepared by validation team is reviewed by an independent technical review team (one or more members) to confirm whether all the internal procedures established and implemented by ESPL were duly complied with and 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 scope the project activity relates to. All team members of technical review team are 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 before the request for issuance is submitted to UNFCCC. 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 has performed the validation of the PoA titled “KOKO Kenya - Ethanol Cookstoves Program” in Kenya. The validation was performed on the basis of rules and requirements defined by UNFCCC for the CDM project activities.
The review of the PoA-DD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) have provided Earthood sufficient evidence to determine the fulfillment of stated criteria. The proposed PoA is meeting all the requirements of the PS for PoA version 2.0, VVS for PoA version 2.0 and PCP for PoA version 2.0. The host Party is Kenya, which fulfils the participation criteria and has approved the PoA “KOKO Kenya - Ethanol Cookstoves Program” and authorized KOKO Networks Ltd. as the Coordinating Managing Entity. The project correctly applies the approved baseline and monitoring methodology AMS.I-E version 9.0.

The PoA involves the installation of improved cook stoves by KOKO Networks Ltd. The current cooking practice in Kenya is the use of the traditional wood fuel burning cooking stove. By installing ethanol cook stove, the project results in reductions of CO_2e emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the baseline scenario is equal to current practice and the emission reductions attributable to the project are, hence, additional to any that would occur in the absence of the proposed CDM PoA.

Appendix 1.Abbreviations

Abbreviations	Full Texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating / Managing Entity
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
CPA	Component Project Activity
CPA DD	Component Project Activity Design Document
DNA	Designated National Authority
DO	Distribution Organisation
DOE	Designated Operational Entities
DRB	Demonstrably renewable woody biomass
EB	CDM Executive Board
EIA	Environmental Impact Assessment
FAO	Food and Agriculture organization
FAR	Forward Action Request
GHG	Greenhouse gas(es)
ICS	Improved Cook Stoves
IPCC	Intergovernmental Panel on Climate Change
LAF	Leakage Adjustment Factor
LSC	Local Stakeholder Consultation
NRB	Non-Renewable Biomass
NEMA	National Environment Management Authority
PA	Project Activity
PoA	Programme of Activities
PoA DD	CDM Programme of Activities Design Document
UID	Unique Identification number

Appendix 2.Competence of team member and technical reviewers

Competence Statement	
Name	Deepika Mahala
Country	India
Education	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU
Experience	3 Years +
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES
Verifier	YES
Methodology Expert	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G

Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2 & TA 3.1)		
Reviewed by	Shreya Garg	**Date**	14/09/2018
Approved by	Anshika Gupta	**Date**	14/09/2018

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	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		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	**Date**	25/01/2019
Approved by	Anshika Gupta	**Date**	25/01/2019

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018

Approved by	Ashok Gautam	**Date**	01/03/2018

Competence Statement			
Name	Sanjeev Kumar		
Country	India		
Education	B. Tech. (Chemical Engineering) M.Tech. (Energy Management)		
Experience	13.5 years +		
Field	Climate Change, Environment, Energy		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (ACM0002, ACM0006, ACM0004, ACM0009, ACM0012, ACM0001, AMS I.D, AMS I.F, AMS I.C, AMS I.A, AMS II.D, AMS II.E, AMS III.H, AM0009, AM0013, AM0025, AM0056, AM0028)		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, 4.1, 13.1)		
Reviewed by	Shreya Garg	**Date**	13/12/2018
Approved by	Anshika Gupta	**Date**	13/12/2018

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

Appendix 3.Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	CME	PoA DD Generic CPA DD	Version 5.0, 11/07/2019	CME
2.	UNFCCC	Applied methodology: AMS-I.E.	Version 9.0	Other
3.	UNFCCC	PCP for PoA	Version 2.0	Other
4.	UNFCCC	PS for PoA	Version 2.0	Other
5.	UNFCCC	VVS for PoA	Version 2.0	Other
6.	UNFCCC	https://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/VDXJMSCMQSCBLXH5OXS8E9HC11I630/view.html	Last accessed on 13/02/2019	Other
7.	UNFCCC	CDM Glossary terms	Version 09.1, page 20	Other
8.	UNFCCC	CDM-PoA-DD-FORM	Version 9.0	Other
9.	UNFCCC	Standard: Sampling and surveys for CDM project activities and programmes of activities	version 7.0	Other
10	KOKO	Manufacturer's specifications	-	Other
11	UNFCCC	Standard: Applicability of sectoral scope	Version 1.0	CME
12	KOKO	Template for KOKO Agents	-	Other
13	UNFCCC	'Tool 19: Demonstration of additionality of microscale project activities,	Version 08.0	CME
14	Daily News Business Daily	Local Newspaper-Public notice Local Newspaper-Public notice	12/12/2018 12/12/2018	Other
15	KOKO	Online announcement-KOKO website-screenshot	-	Other
16	KOKO	Emails for LSC invitation	12/12/2018	Other
17	Kenya Bureau of Standards	Kenya Standard KS 2759:2018	2018	Other
18	Kenya National Bureau of Statistics	National Economic Survey	2018	Other
19	UNFCCC	Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities	Version 4.0	Other
20	Govt. of Kenya	The Energy Act 2006	2006	Other
21	Ministry of Energy, Kenya	Feed-in Tariff Policy 2008: Development of electricity generation projects from renewable sources	03/2008	Other
22	Republic of Kenya	The Energy (Energy Management) Regulations 2012: Promotion of Energy Management and Conservation in Kenya	2012	Other
23	Republic of Kenya	The Energy Bill 2017: National Integrated Energy Policy	2017	Other

24	KOKO	No ODA declaration	-	CME
25	UNDP	Human Development Indices and Indicators: 2018 Statistical Update http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/KEN.pdf	2018	Other
26	IRENA	BIOETHANOL IN AFRICA: THE CASE FOR TECHNOLOGY TRANSFER AND SOUTH-SOUTH CO-OPERATION	10/2016	Other
27	NEMA	List of EIA requiring projects: https://www.nema.go.ke/index.php?option=com_content&view=article&id=119&Itemid=144	Last accessed 28/02/2019	Other
28	KOKO	LSC photos	20/12/2018	CME
29	KOKO	LSC summary report	20/12/2018	CME
30	KOKO	Filled MOC	01/02/2019	CME
31	UNFCCC	CDM-MOC-FORM	Version 3.0	Other
32	The Beijing Institute & The Royal Swedish Academy of Sciences Stockholm, Sweden	Energy and Development in Kenya – Opportunities & Constraints	1984	CME
33	Republic of Kenya	National Climate action Plan	2013-2017	CME
34	Republic of Kenya	Second National Communication to UNFCCC	2015	CME
35	KOKO	Annual Training Calendar schedule	-	CME
36	-	PoA 7359 https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/2XJUR5NOWHY7T8BDAFM4613CIG9VS0/view	Last accessed on 28/02/2019	Other
37	KOKO	LSC attendance sheet	20/12/2018	CME
38	Govt of UK Govt. of Australia	Photo ID of the focal points- Ed Angnew- driving Licence Greg Murray	-	CME
39	KOKO	Proof of Employment - Ed Agnew and Greg Murray	04/02/2019	CME
40	KOKO	KOKO Cooker Sales Database Template	-	CME
41	KOKO	ERPDA Contract between KOKO and Ecoeye Co., Ltd.	-	CME
42	UNFCCC	List of registered PoA https://cdm.unfccc.int/ProgrammeOfActivities/registered.html	-	Other
43	UNFCCC	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-19-v1.pdf/history_view	-	Other
44	NEMA	Letter of Approval	12/04/2019	CME
45	UNFCCC	List of DNA https://cdm.unfccc.int/DNA/index.html	-	Other
46	FAO	Break-up of Alcohol for Beverage and Non-Food purpose from FAOSTAT (http://www.fao.org/faostat/en/#data)	Linked accessed on 12/07/2019	Other
47	UNIDO	Baseline Report of Clean Cooking	07/10/2015	CME

		Fuels in the East African Community		
48	Joseph Mbothu et al	Lifecycle greenhouse gas emissions and energy balances of sugarcane molasses-based bioethanol in Kenya	-	CME
49	Ebelechukwu Chiatula	Energy footprint of locally produced bioethanol in Kenya	April, 2013	CME
50	KOKO	Joint quality control protocol for bio-ethanol cooking fuel	-	CME
51	KOKO	Product specifications of bioethanol	-	CME
52	IPCC	IPCC Guidelines for National Greenhouse Gas Inventories 2006	2006	Others
53	Biofuel Digest	https://www.biofuelsdigest.com/bdigest/2018/07/02/vivo-energy-teams-with-koko-networks-to-retail-ethanol-cooking-fuel/	02/07/2018	Others
54	Petrol World.com	https://www.petrolworld.com/africa-middle-east/item/32032-kenya-vivo-energy-koko-world-s-first-smart-fuel-atm-network-launch	19/03/2019	Others
55	CME	Electricity consumption calculation sheet	-	CME
56	Africa Turnaround Limited	Baseline Fuel Market Study	08/2016	CME
57	UNFCCC	Tool 5: Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	Version 03.0	Other
58	Stephen Karekezi, John Kimani and Oscar Onguru	Global Network on Energy for Sustainable Development "Urban and Peri-Urban Energy Access" Working Group	05/2008	CME
59	International Institute for Environmental development	Biomass Energy use in Kenya	10/2010	CME
60	UNFCCC	TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	Version 3.0	Other
61	Nathan R Brand et al.	Research Paper "Histology and Cytopathology Capacity in the Public Health Sector in Kenya" by Brand et. al. (https://www.semanticscholar.org/paper/Histology-and-Cytopathology-Capacity-in-the-Public-Brand-Wolf/2df2766c45d9984ddc3bcb352731be9893c38207)	2018	CME
62	UNFCCC	TOOL16: Project and leakage emissions from biomass	Version 4.0	Other
63	UNFCCC	TOOL12: Project and leakage emissions from transportation of freight	Version 1.1.0	Other
64	Kenya Climate Innovation Centre	https://www.kenyacic.org/sites/default/files/publications/KCIC%20ICS-3.pdf	-	Other

65	KOKO	https://kokofuel.com/koko-cooker/	-	Other
66	-	Google Maps https://www.google.com/maps/@28.4117876,77.0449321,15z	-	Other

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

Table 1. CLs from this validation

CL ID	01	Section no.	D.1.10, D.1.11, D.1.12	Date : 22/01/2019
Description of CL				
1.As per para 69 of the PS for PoA version 2.0, The coordinating/managing entity shall obtain a letter of approval from the DNA of each Party involved in the proposed CDM PoA. 2.As per para 31 of PCP for PoA version 2.0, The coordinating/managing entity shall submit to the DOE at the time of validation of the proposed CDM PoA an MoC statement using the valid version of the "Modalities of communication statement form" (CDM-MOC-FORM), including its annex 1.				
Project participant response				Date : 25/02/2019
(a)The application for host country approval is in process with National Environment Management Authority of Kenya (NEMA). The HCA letter will be submitted to DoE as soon as it is issued. (b)The filled MoC form along with required verification documents is attached as Annex-1 with this response.				
Documentation provided by project participant				
Filled MOC Form				
DOE assessment				Date: 26/02/2019
1.The LoA has not been received from the PP. Open. 2.The filled MOC has been submitted by the CME. The form was checked and found to be meet the requirements of the PS for PoA version 2.0 and VVS for PoA version 2.0. Closed				
Project participant response				Date : 15/04/2019
The Letter of Approval is received from the DNA (NEMA) dated 12th April 2019. The same is submitted to the DOE herein. The PoA-DD is appropriately revised.				
Documentation provided by project participant				
Revised PoA-DD Letter of Approval				
DOE assessment				Date: 16/04/2019
The CME has submitted the LoA received from host country DNA- National Environment Management Authority (NEMA). The title of the PoA and the CME name was found to be consistent between the PoA DD and the LoA. Thus, the CAR stands closed.				

CL ID	02	Section no.	D.2.2.5., D.2.1., D.1.5.	Date : 22/01/2019
Description of CL				

1.CME shall indicate the small-scale project type (Type I, Type II and/or Type III) applicable to the generic CPA in accordance with the project standard, under section H.3. and I.2 of the generic CPA DD.

2.As per para 105, PS for PoA, when establishing the baseline scenario, the coordinating/managing entity shall take into account the two types (E+ and E-) of national and/or sectoral policies or regulations.

3.As per para 41, PS for PoA, the coordinating/managing entity shall determine the start date of the proposed CDM PoA and provide a description of how the start date has been determined in accordance with the definition of the start date in the "Glossary: CDM terms". The date given is the PoA DD is not the start date of the publication period.

Project participant response	Date : 25/02/2019

1.PoA-DD is revised to include information about the type of project activity. Please refer section H.3.

2.E+/E- policies relevant to the project activity is discussed in section H.3 of PoA-DD.

3.The start date of PoA is revised to make it inline with the date of publication of PoA-DD.

Documentation provided by project participant
Revised PoA DD

DOE assessment	Date: 26/02/2019

1.CME has indicated under section H.3. and I.2. of the generic CPA DD that the generic CPA is type I. The generic CPA was found to meet requirement of para 126(a) of PS for PoA.

2.CME has listed the energy policies of the country in generic CPA DD. However, none of the policies give any type of comparative advantage to a particular technology or fuel and hence cannot be classified as E+ or E- policy.

3.The start date of the Poa has been updated. The date has determined by considering the publication date of PoA. The date was confirmed from the UNFCCC website and found to be correct.

Thus, the CAR stands closed.

CL ID	03	Section no.	D.1.3., D.2.1.	Date : 22/01/2019
Description of CL				

1.The CME shall explain the detail management system under section B of the PoA DD, as per para 36 of the PS for PoA version 2.0 including:
(a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;
(c) A procedure for technical review of inclusion of CPAs;
(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or included as a CPA in another registered CDM PoA);
(e) Records and documentation control process for each CPA under the PoA;
(f) Measures for continuous improvements of the PoA management system;

2.CME shall explain the flow of information from the end user level to the database maintained. Records and documentation control process for each CPA (to be included at the time of inclusion) under the PoA.
3.It is not clear how it will be ensured that the project does not lead to discontinuation of other CDM activities.

Project participant response	Date : 25/02/2019

1.The revised PoA-DD contains all the information in accordance with para 36 of the PD for PoA Version 2.0.

2.Since the complete registration process including payment is performed online, the sales database is updated automatically as and when there is a new registration of a cookstove purchaser. The same information is provided in section B of the PoA-DD.

3.The requirement of paragraph 166 of PS for PoA is now discussed in section H.3 of the PoA-DD.

Documentation provided by project participant	
Revised PoA DD	
DOE assessment	Date: 26/02/2019

1.The Management plan stated in the PoA DD has been revised. The revised plan was found to meet the requirements of para 36 of the PoA DD and the template guidelines.
2.The flow of the information has been clearly explained under section B of the PoA DD. The information was validated through on-site observations and interviews with the local team.
3.The CME has demonstrated under H.3., how the project will not lead discontinuation of CDM activities. The unique features of the stoves like use of bio ethanol and digital enabled infrastructure makes the PoA distinct than the other PoAs in the country.

Thus, the CAR stands closed.

CL ID	04	Section no.	D.2.2.1.	Date : 22/01/2019

Description of CL

As per the applied methodology, For project activities introducing bioethanol cookstoves project participants or coordinating and managing entities shall demonstrate that the bioethanol cookstoves are designed, constructed and operated to the requirements (e.g. with regard to safety) of a relevant national or local standard or comparable literature. Latest guidelines issued by a relevant national authority or an international organisation may also be used.

PP shall confirm that the requirement has been met and provide documentary evidence for the same.

Project participant response	Date : 25/02/2019

The demonstration of compliance of ethanol cookstoves with the national safety standard is presented in section I.2 as per the Methodology applicability requirement.

Documentation provided by project participant	
Revised PoA DD	
DOE assessment	Date: 26/02/2019

Kenya Standard KS 2759 covers the requirements for ethanol fuelled appliances for cooking and heat generation in households. The details of KOKO stove were checked from the manufacturer's specifications/10/ and found to comply with standard. The criterion has been met.
Thus, the CAR stands closed.

Table 2. CAR from this validation

CAR ID	05	Section no.	D.2.2.6.	Date : 22/01/2019
Description of CAR				
Under section I.6.1. and I.6.3. of the PoA DD, the CME has applied option (b), para 21 of the applied methodology to determine By but the equations stated under these sections are applicable to the cases where option (a) of the methodology used.				
Project participant response				Date : 25/02/2019
The erroneous presentation of equation has been corrected in the revised PoA-DD. The revised equation is conforming to option (b) of the applied methodology.				
Documentation provided by project participant				
Revised PoA DD				
DOE assessment				Date: 26/02/2019
The equation has been revised. The equation was checked and found to be in line with the applied methodology para 21, option b. Thus, the CAR stands closed.				

CAR ID	06	Section no.	D.2.2.7.	Date : 22/01/2019
Description of CAR				
1.Parameters, $Stove_{year\ and}$ $\mu_{HH,y}$, have been used in the sample calculations presented under section I.6.3. of the PoA DD. However, these parameters have not been listed under the list of ex-ante o ex-post parameters. 2.Following parameters are not listed under the ex-ante or ex-post parameters: $N_{p,I,y,I}$: Average number of persons served per institution in year y, number $N_{I,I}$: Number of institutions type i prior to project implementation, number 3.$BC_{PJ,HH,Y}$ / $BC_{PJ,I,}Y$ is a monitored, whose value will be determined through surveys and sampling. QA/QC procedures for this parameter was found to be missing under table I.7.1.3. Also the method to determine the value of the parameter. 4.As per the sampling standard (paragraph 22) the application of 95/10 confidence/precision for CPAs solely composed of micro-scale CDM units is mandatory hence the same shall be applied. However, section I.7.2., Page 25, of the PoA DD quotes that "the sample size will be chosen for a 90/10 precision (90% confidence interval and 10% margin of error); except when a single sampling plan covering a group of CPAs is undertaken, in which case 95/10 confidence/precision is applied for the sample size calculation". 5.The CME shall follow "Guideline: Sampling and surveys for CDM project activities and programmes of activities" while designing the sampling plan.				
Project participant response				Date : 25/02/2019

1. The parameter $\mu_{HH,y\ has}$ been removed from the equation. The parameter $Stove_{Year}$ is explained in I.7.1.1. No separate monitoring parameter is added as it is a derived variable determined based on the monitoring parameter, Di.
2. The parameters $N_{p,I,y}$ is a monitoring parameter as per the requirement of the methodology and has been accordingly included in the ex-post parameters. The parameter $N_{I,i}$ is already included in section I.7.2.2.
3. QA/QC section has been revised.
4. The text has been corrected and 95/10 confidence/precision is consistently reported as per the CDM requirement.
5. The revised sampling plan is designed in accordance with "Guideline: Sampling and surveys for CDM project activities and programmes of activities"

Documentation provided by project participant	
Revised PoA DD	
DOE assessment	Date: 26/02/2019

1. Parameter $\mu_{HH,y\ has}$ been removed from the equation. The $Stove_{year}$ will be adjusted
2. Parameter Np,I,y has been added to the list of parameter. Parameter Ni,j is listed along with $N_{HH.}$
3. QA/QC procedure has been added for the parameter- $BC_{PJ,HH,Y}$ / $BC_{PJ,I,}Y$.
4. The revised plan states that 95/10 confidence/precision will be applied consistently.
5. The sampling plan has been revised to include the parameters(ratio/proportion) to be monitored.

The plan was found to be in line with the "Guideline: Sampling and surveys for CDM project activities and programmes of activities".

Thus, the CAR stands closed.

CAR ID	07	Section No.	D.1.2., D.2.2.7.	Date : 07/03/2019

Description of CAR

1. The PoA DD does not specify the details of the stoves to be disseminated.
2. The PoA DD does not mention the formulas to be applied for sampling under section I.7.2.of the PoA DD.
3. The monitoring frequency of the parameter np,I is not in line with the applied methodology.
4. In the PoA DD it is mentioned that a unique serial numbering system will be applied; the information is linked to a mobile number. It is not clear who will provide the unique numbers to the stoves and how will it be ensured that one HH/Institution has only one stove?

Project participant response	Date : 27/03/2019

1. The PoA-DD has been revised to include the complete specifications of the cookstove that is currently being launched. There may be more models of the cookstove which can be launched in future. The complete details of the cookstove models used in the PoA-DD will be captured at the verification stage.
2. The revised PoA-DD has included the sampling formulae for illustration. It is also clearly mentioned in the PoA-DD that the sampling will apply formulae as described in the Guideline: Sampling and Survey for project activities and programme of activities Version 4.
3. The frequency of monitoring parameter has been corrected.
4. The CME will have complete control over management of serial numbers and its linkage to the registered mobile phones. It is highly unlikely that a family will have more than 1 cookstove due to its high capital cost.

Documentation provided by project participant	
Revised PoA DD	
DOE assessment	Date: 28/03/2019

1.The revised PoA DD now includes detailed information of the stove models to be included. At the time of CPA inclusion, more models can be included as along as the models meets the PoA requirements.
2.The sampling formulas have been included in the revised PoA DD. The formulas were checked and found to be in line with the Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, Version 4.0.
3.The frequency of the monitoring has been corrected in the PoA DD. The frequency is now in line with the applied methodology.
4.The CME has control over the serial numbers. The automated generated of serial numbers and mobile numbers linked are saved for each customer and high capital cost of the stove are the factors will which not lead to possession of more than stove by the end users.

Thus, the CAR stands closed.

CAR ID	08	Section No.	D.2.2.7.	Date : 04/04/2019
Description of CAR				
1.Para 31 of the applied methodology states "In order to assess the leakages, monitoring shall include data on the amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on non-renewable woody biomass use required for leakage assessment shall also be collected". CME shall explain how this has been addressed. 2.$BC_{PJ,PP,y}$ and $\mathbf{N_{l,i}}$ - are separate parameter in methodology to monitor; 3.Notations of the parameters are inconsistent with the applied methodology and also within the PoA DD.				
Project participant response				Date : 15/04/2019
1.The requirement related to monitoring of parameters for leakage emissions associated with woody biomass consumption by non-project households, as discussed in paragraph 31 of the methodology, is further elaborated in paragraph 34 which is specific to PoA-DD. It shall also be noted that both paragraph 31 and 34 are supplementary to section 5.5 (paragraph 24-29) which covers all types of Leakage Emissions. As per section 5.5 (Leakage Emissions) and paragraph 34 (specific to PoA) of the methodology, the PoAs are exempted from monitoring the woody biomass consumption by the non-project households if the PoA applies a leakage adjustment factor of 0.95 in the emission reduction calculation. This PoA has appropriately applied the leakage adjustment factor (LAC) as described in the section I.6.3 of the PoA. 2.The revised PoA DD has separately presented the parameters $BC_{PJ,PP,y}$ and $\mathbf{N_{l,I}}$. 3.Notations are made consistent within the PoA-DD. Since, the equations used in PoA-DD are customized for households and institutions incorporating other operational parameters, the notations are modified for better identification.				
Documentation provided by project participant				
Revised PoA-DD				
DOE assessment				Date: 16/04/2019
1.The CME has applied a gross adjustment factor -0.95 as an alternative to leakages stated in para 34(a) and (b). The approach was found in line with the applied methodology. 2.The parameters are reported separately in the PoA DD. 3.Notations were checked and found consistent within the PoA DD. Thus, the CAR stands closed.				

CAR ID	10	Section No.	D.1.2., D.1.3., D.2.2.5., D.2.2.6., D.2.2.7	Date : 28/06/2019
Description of CAR				
1.The applied methodology (AMS I.E version 9) is applicable for technologies displacing use of non-				

renewable biomass by renewable energy, and paragraph 32 of the methodology requires monitoring the displacement of non-renewable woody biomass at each location and monitoring the quantity of renewable biomass.

However, (1) it is not clear how the PoA would ensure that ethanol to be distributed in the PoA would be renewable energy given the fact that the PoA does not involve production of bioethanol (i.e. page 21 of PoA-DD); (2) the fuel type required by the eligibility No. 4 (i.e. Ethanol) criteria does not specify the use of renewable energy (i.e. bio-ethanol); (2) the monitoring plan of the generic CPA-DD does not cover the requirement of paragraph 32 of AMS I.E version 9.

2.As per eligibility criteria No. 7, the target group of the PoA is household or SME (i.e. institution). However, the baseline of the PoA is demonstrated and established on household basis exclusively (i.e. section I.5 of the PoA-DD). The CME shall to provide information on (a) the baseline for SME/institution users; (b) the appropriateness of not distinguishing the baseline ex-ante values for household and SME user, in particular BCBL,PP,y (i.e. Average annual consumption of woody biomass per person before the start of the project activity). In addition, it is not clear how the baseline fuel type of the end users would be identified and confirmed.

3.To avoid double counting, paragraph 166 of PS for PoA version 2 requires that CPA does not share or utilize any of the assets of the former project in the same geographical location. However, the ethanol fuel infrastructure in the geographical location of the PoA is already existing (page 19 of the PoA-DD) and it is not reported on whether there is other CDM project activities/PoAs are already operating in the same location of the PoA. The CME is requested to provide information on whether there is other CDM project activities/PoAs are already operating in the same location of the PoA and applying the same technology (i.e. bio-ethanol cook stoves) and demonstrate the compliance with paragraph 166 of PS for PoA version 2.

4.Page 12 of AMS I.E version 9 requires monitoring of parameter NCVbiomass (i.e. Net calorific value of biomass displaced by the project activity). However, this parameter is determined ex-ante as per page 22 of the PoA-DD.

5.Paragraph 22 of AMS I.E version 9 requires project emission from (a) production of bioethanol; (b) consumption of fossil fuels and electricity; (c) transportation. However, page 25 of the PoA-DD states that the project emission is considered as zero as the PoA does not involve production of ethanol. The DOE shall specify on how it has validated the compliance with such requirement.

Project participant response	Date : 15/04/2019

1.KOKO Networks has partnered with a reputed Fuel Marketing Company (FMC), Vivo Energy, to procure bioethanol from bioethanol producers in Kenya and nearby countries . Bioethanol in Kenya and whole of East Africa is produced through the distillation of molasses, which is a waste product from the sugar production process. One of the reasons for establishing the PoA in Kenya was the high production of sugarcane in the country and the neighboring countries ensuring reliable supply of bioethanol from molasses. The average production of molasses in East Africa during 2010 to 2013 is provided below:

CountriesMolasses Production (MT)
Kenya140,000
Ethiopia85,000
Uganda71,000
Tanzania62,000
Burundi5,000
Rwanda2,000
Total365,000
Source: pg 130, Baseline Report of Clean Cooking Fuels in the East African Community, GAIA

The renewable fuel to be utilized in this PoA will be centrally procured by the procurement partners of KOKO Networks. Then it would be distributed to all CPAs by the CME through KOKOpoints. The procurement partners may source fuel under long term arrangements with bio-ethanol producers. The fuel will be accepted for distribution to KOKOpoints after checking conformance on following parameters:
•Technical parameters of fuel quality as per international standards
•Fuel type ascertaining its renewable nature (Bioethanol will be exclusive fuel used in the PoA)

About 93% of ethanol is produced from renewable sources owing to better economic feasibility. Since

the smart cookers technology is solely dependent on the dedicated fuel supply through KOKOpoints (no external fuel filling possible due to proprietary valve system), they will only operate on bioethanol which will be centrally procured by the CME through a framework agreement with Vivo Energy (Shell Licensee), one of the most reputed Fuel Marketing Companies (FMCs) . The fuel protocol as part of framework agreement restricts the procurement of synthetic bioethanol for this PoA.

2.The approach for baseline emissions for SME has been revised to approach 4 of AMS-I.E. as it is not based on any assumption related to biomass consumption in the baseline but based on actual bioethanol consumption. Approach 4 is the simplest approach as it requires calculates directly from the thermal energy generated in the project activity.

$B_y = \sum_i^n HG_{p,y} \div (NCV_{biomass} \times \eta_{old,i})$

Where:

$HG_{p,y}$= Quantity of thermal energy generated by the new renewable energy technology in the project in year y (TJ)

$\eta_{old,i}$ = Efficiency of pre - project device per type of device i

Efficiency of pre-project device will be determined at the time of 1st CPA inclusion and will be fixed for all CPAs

Consumption of bioethanol will be included as a monitoring parameter in line with the methodological requirement. It will be monitored using a project survey for SME to determine the mean annual bioethanol consumption by an SME. The survey would be conducted in accordance with requirements of standard for sampling and survey.

3.Information on page 19 is revised to explain that there is no existing infrastructure for bioethanol in the country. CME was referring to storage facilities available for petroleum products which will be utilized for this PoA, which has no significance with respect to double counting.

All the above CDM projects are distributing cookstove on cost basis with substantial capital investment for households. Due substantial cost of manufacturing, CME has kept the price of KOKO cooker at 69.99 USD (https://kokofuel.com/koko-cooker/). It is highly unlikely that if a consumer has purchased a cookstove under any other former CDM project, he will be able to purchase KOKO cooker. Thus, the substantial capital investment acts as a barrier and avoid discontinuation of former CDM project activity. However, CME has implemented robust measures to avoid discontinuation of other previously registered CDM projects at 2 levels. Firstly, at the time of distribution of cookstoves, the baseline appliance which the KOKO cooker is replacing will be recorded in the CME sales database and it will be confirmed, if improved cookstove is identified, that the baseline appliance is not a part of other CDM registered project. Secondly, at the time of periodic project monitoring through sampling and survey, it will be confirmed through physical inspection that the baseline appliance is not part of other CDM project, if the baseline appliance is still in use.

4.NCV biomass is included as monitoring parameter. In line with the applied methodology, default values are taken for wood fuel and charcoal. The monitoring of NCV of bioethanol will be done annually as per methodology.

5.The project emissions as identified by the methodology are discussed in the Project Emissions section. The emissions identified by the applied methodology AMS-I.E. are discussed below:

*(a)*CO2 emissions from on-site consumption of fossil fuels due to the project activity, calculated using the latest version of "TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", including the consumption of fossil fuels for any processing of feedstock;
The PoA does not involve consumption of fossil fuel as the only activities involved in the delivery of bioethanol are transportation and storage of fuel.

*(b)*CO2 emissions from production of bioethanol
CME has adopted the best possible approach of determining emissions based on the relevant information and extracts from published reports, surveys or life cycle assessment studies. As per the latest research paper published on Kenyan bioethanol production - "Lifecycle Greenhouse Gas Emissions and Energy Balances of Sugarcane Molasses-Based Bioethanol in Kenya".

*(c)*CO2 emissions from electricity consumption by the project activity using the latest version of "TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation", including the consumption of electricity for any processing of feedstock;
The only activity/asset that require electricity in the complete supply chain is the operations of fuel-

ATM – KOKOpoints. The operation of KOKOpoint will require small amount of electricity for the display screen. This energy is supplied from the grid electricity. The total emissions will be estimated by multiplying number of KOKOpoints with the average annual electricity consumption of a KOKOpoint. The emissions due to electricity consumption of KOKOpoints is calculated by applying the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" while average electricity consumption by a KOKOpoint is estimated below.

Description	Value
Power Consumption of a KOKOpoint as per specifications	20 W
Average daily number of hours of operation (Conservative)	4 Hours (equivalent to 28 hours of operations per week)
Average time consumed for refilling the canister	10 minutes
Average number of customers per KOKOpoint	100 households (equivalent to 16.67 hours of operations per week)
Annual electricity consumption per KOKOpoint	29.2 kWh/year

As per paragraph 16 of Tool 5, equation (1) is used to calculated project emissions associated with electricity consumption of KOKOpoints:

$PE_{EC,y} = \sum EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})$

$= N_{KP} \times EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})$

$PE_{EC,y}$ - Project emissions from electricity consumption in year y (tCO2/yr)

N_{KP} – Number of KOKOpoints installed under the project activity

$EC_{PJ,j,y}$ - Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)

$EF_{EF,j,y}$ - Emission factor for electricity generation for source j in year y (t CO2/MWh); A conservative default value of 1.3 tCO2/MWh is used, according to option A.2 (a) of the tool, since only project emissions are calculated and not baseline emissions.

$TDL_{j,y}$ - Average technical transmission and distribution losses for providing electricity to source j in year y; A conservative default value of 20% is used, according to option parameter/data table 3 of the tool, since leakage emissions are calculated.

*(d)*Project emissions from transportation are estimated using the latest version of the tool "TOOL12: Project and leakage emissions from transportation of freight," if the transportation distance is more than 200 km; otherwise they can be neglected."

The western belt of Kenya is the key site of bioethanol production due to high sugarcane cultivation and hence also supports majority of population of Kenya. The average distance between origin and destination of bioethanol in western belt which be much less at around 35 kms. The average distance for another high density area, Nairobi city region is 296 kms from the western belt. The weighted average distance for the transportation of bioethanol is 135 kms which is less than 200 kms.

However, since the distribution of fuel from fuel depots to KOKOpoint is coordinated by CME, CME has conservatively considered the transport emissions associated with fuel distribution to KOKOpoints as project emissions. The dedicated transport vehicles would fill the fuel from nearby fuel depots and deliver it to all KOKOpoints making a round trip. The round trip distance of all routes will be determined and average distance per trip would be calculated. This average distance will be multiplied by the number of total trips made during the year to calculate the total distance travelled during the year. The vehicle class will also be recorded for the purpose of default Emission factor selection. The project emissions due to transportation of fuel will be calculated by using equation (1) as described in paragraph 20 of Tool 12 "Methodological tool: Project and leakage emissions from transportation of freight"

Documentation provided by project participant

Revised PoA-DD
Baseline Fuel Transportation Emissions
Baseline Report of Clean Cooking Fuels in the East African Community by GAIA
Energy Footprint of locally produced bioethanol in Kenya" by PISCES Consortium by the University of Edinburgh
Break-up of Alcohol for Beverage and Non-Food purpose from FAOSTAT

"Scaling up clean cooking in urban Kenya with LPG & Bio-ethanol" by Dalberg	
DOE assessment	Date: 16/04/2019

1.The bioethanol is a waste product of Molasses distillation process. The production of Ethanol for commercial purpose is financially not feasible. The document referred "Baseline Report of Clean Cooking Fuels in the East African Community, GAIA" was reviewed to confirm the stated values of Molasses production in East African Countries. The high production of Molasses ascertain that the procuring bioethanol is easier and cheaper than the synthetic ethanol.

To ensure the use of only bioethanol as the fuel in the project stove, the CME has underlying provisions in the PoA:

- Partnership with Vivo Energy, which is a reputed Fuel Marketing Company (FMC) as checked to procure bioethanol.
- Fuel protocol as part of framework agreement. The fuel is accepted only after checking the technical parameter and renewable nature of fuel type.
- Installation of KOKO ATMs to supply fuel to each individual buying the stove.
- Smart cannisters filled by only KOKO ATMs

(b) The fuel type is mentioned under eligibility no.4, However, it is not clear that what supportive evidence would be sought at the CPA level to ensure the use of Bioethanol.

OPEN

c) Please clarify how the PoA complies with para 32 of the applied methodology with regard to monitoring the displacement of non-renewable woody biomass at each location and monitoring the quantity of renewable biomass

OPEN

2.The baseline ex-ante values have been distinguished now. However:

- $HG_{p,y}$= Quantity of thermal energy generated by the new renewable energy technology in the project in year y (TJ) is not listed as a parameter under section E.6.2 and I.7.1.

- In addition, it is not clear how the baseline fuel type of the end users would be identified and confirmed.

- The CME shall to provide information on (a) the baseline for SME/institution users

OPEN

3.There is another CDM PoA(PoA 7359) in the same geographical area which applies same measure and same resource type. Thus, the conditions in 166(a-c) of PS for PoA version 2.0 are not met. However, as per para 168 of PS for PoA version 2.0, other means can also be used to confirm that the project will not lead to discontinuation of the former projects.

The PoA has following provisions to avoid double counting:

- The CME's team will record the baseline appliance, replacing KOKO stoves, at the time stove dissemination. The information has been added under CPA implementation process, page 10 of the PoA DD.

- The CME will also monitor through physical inspection during periodic sampling surveys if the baseline appliance is still in use.

Also, the price of the stove is expensive. It is highly unlikely for a consumer already owning a stove to buy such a product.

The same has been discussed under section D.1.3. of the validation report. Closed.

4.NCV biomass has been included in the monitoring parameter. The parameter will be monitored

annually either by conducting in-house test using the bomb-calorimeter or by third party testing agency. The approach was found to be in line with the applied methodology.

5.Project emissions from the project activity have now been determined using para 22 of the applied methodology.

e)CO2 emissions from on-site consumption of fossil fuels due to the project activity, calculated using the latest version of "TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
The PoA does not involve consumption of fossil fuel. The only point of fossil fuel consumption is transportation and storage of fuel.

f)CO2 emissions from production of bioethanol- since the tool referred in the methodology does not prescribe a method to calculate this if the production is not under the control of CME. The CME has determined a value of emission factor for 1L of bioethanol production based on the published study report. The sourced were verified and found to be reliable.

g)Emissions from electricity consumption: Please provide the evidence for assumptions stated in the PoA DD. OPEN

h)Emissions from transport: The average distance is less than 200kms as demonstrated in the PoA DD. However, the CME has conservatively accounted for the transport emissions associated with fuel distribution to KOKOpoints. Average distance for each round trip made by the vehicles from fuel depots to KOKOpoints would be calculated. This will be used to find out the total distance traveled by vehicles throughout the year by multiplying the distance obtained with total number of trips made, which will be monitored. The approach was found to be in line with applied methodology AMS-I.E. version 9.

Project participant response	Date : 12/07/2019

1.Since the bioethanol for all CPAs will be procured by the CME in a centralized manner, hence check is required at the CPA level. However, an internal assessment would be done to ensure that fuel is available for smooth operations of the CPA. An internal approval requirement from CME is included as a condition in eligibility criteria No. 4.
For monitoring of renewable biomass, the quantity of bioethanol utilized in the PoA will be monitored as parameter Q_{Eth}. The baseline fuel, if utilized during the operations of project activity, will be monitored as $BC_{PJ,PP,y}$ as part of project survey. Hence, the monitoring plan is complying to the requirements of paragraph 32 of AMS-I.E.

2.PoA-DD has been revised to include $HG_{p,y}$ = Quantity of thermal energy generated by the new renewable energy technology in the project in year y (TJ) as a monitoring parameter under section I.7.1.

Since the section I.5 of PoA-DD did not discuss the baseline scenario for SME category, it is now revised to include relevant details and information about the baseline scenario for SME category in Kenya.

The CME will use following means to identify and confirm displacement of baseline fuel:

- The CME's team will record the baseline appliance, replacing KOKO stoves, at the time stove dissemination. The information has been added under CPA implementation process, page 10 of the PoA DD.

- The CME will also monitor through physical inspection during periodic sampling surveys if the baseline appliance is still in use. The same is included in the monitoring plan.

3.Closed
4.Closed
5.The assumptions for electricity consumption are discussed in the attached excel sheet.

Documentation provided by project participant
Revised PoA Excel Sheet for Emissions due to Electricity Consumption

DOE assessment	Date: 15/07/2019

1.b) eligibility criterion 4 has been revised to include condition.
c)Condition para 32 of the applied methodology has been fulfilled by monitoring the monitoring the displacement of non-renewable woody biomass at each location under parameter BCPJ,PP,y and monitoring the quantity of renewable biomass $Q_{HH,Eth}$ and $Q_{SME,Eth}$.

2. The baseline ex-ante values have been distinguished now. However:

- $HG_{p,y}$= Quantity of thermal energy generated by the new renewable energy technology in the project in year y (TJ) has now been listed under section I.7.1. The parameter will be monitored annually through monitoring surveys. The approach was found to be in line with the applied methodology.

- Baseline fuel type will identify at the time of disseminated. The CME's team will record the information regarding the baseline appliance, replacing KOKO stoves, and thus the baseline fuel type at the time stove dissemination. The information has been added under CPA implementation process, page 10 of the PoA DD. The CME also plans to monitor during the periodic sampling surveys if the baseline appliance continues to be in use.

- The baseline scenario for SMEs is use of woody biomass to meet the similar thermal needs. The demonstration of baseline scenario has been shown in detail under section I.5. of the PoA DD. The referred sources and statements were checked and found to be correctly stated. The baseline has been established in line with the applied methodology.

5. ER calculation sheet has been provided by the CME justifying each value applied to determine the project emission due to electricity consumption factor. All the applied values and assumptions were found to be correct and justified.
Thus, the CAR stands closed

Table 3. FAR from this validation

FAR ID	09	Section No.	D.2.2.7.	Date : 04/04/2019
Description of FAR				
The PoA DD states that the ex-ante parameters listed below will be determined at the CPA level: $BC_{BL,PP,y}$ f_{NRB} Np,HH The DOE involved in the first verification shall corroborate the parameters for CPAs included directly by the CME (i.e., not being validated by any DOE).				
Project participant response				Date : DD/MM/YYYY
-				
Documentation provided by project participant				
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DOE assessment				Date: DD/MM/YYYY
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Document information

Version	*Date*	*Description*
03.0	31 May 2019	Revision to: •Ensure consistency with version 02.0 of the "CDM validation and verification standard for programmes of activities" (CDM-EB93-A08-STAN); •Make editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the "CDM validation and verification standard for programme of activities" (version 01.0).
01.0	4 May 2015	Initial publication.

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