

# VALIDATION REPORT

## EFFICIENT COOKING WITH UGASTOVES

### UGANDA

FINAL  
REPORT No. 2008-9223  
REVISION No. 04

CDM Validation Report Template  
Version 5.0, November 2006

*This is a report template to be used for the validation of CDM projects. Guiding text is presented in italic letters, as here.*

*This document must be seen in conjunction with the [Validation and Verification Guidelines](#)*

Date of first issue: 01/06/2008	Project No.: 01 999 2120 9223
DOE: TÜV Rheinland ( CDM- E-0013 / JI- E-0012 )	Organisational unit: TIE
Client: Climate Care ( JP Morgan Ventures Energy Corporation )	Client ref.: Dr. Adam Harvey

**Project Name:** Efficient Cooking with Ugastoves  
**Country:** Uganda  
**Methodology:** Methodology for Improved Cook-Stoves and Kitchen Regimes  
**Version:** 01  
**GHG reducing Measure/Technology:** Improved Cook-Stoves ( Energy-Efficiency )  
**ER estimate:** 85,615 tCO<sub>2</sub>e per annum  
**Size**  
☒ Large Scale  
☐ Small Scale  
**Validation Phases:**  
☐ Desk Review  
☐ Follow up interviews  
☒ Resolution of outstanding issues  
**Validation Status**  
☐ Corrective Actions Requested  
☐ Clarifications Requested  
☒ Full Approval and submission for registration  
☐ Rejected

In summary, it is TÜV Rheinland's opinion that the "Efficient Cooking with Ugastoves"-project in Uganda, as described in the PDD of 24 March 2009, meets all main UNFCCC requirements for the CDM and all main host country criteria as well as requirements for Voluntary Offset Projects under the Gold Standard and correctly applies the baseline and monitoring methodology "Methodology for Improved Cook-Stoves and Kitchen Regimes", version 01. After all corrective action and clarification requests could be resolved TÜV Rheinland recommends to submit the request for registration for the project activity directly to Gold Standard Foundation (GS-TAC).

Report No.: 2008-9223	Date of this revision: 24/03/2009	Rev. No. 04
Report title: Efficient Cooking with Ugastoves, Uganda		

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## Abbreviations

*Explain any abbreviations that have been used in the report here.*

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNA	Designated National Authority
FCAR	Forward Corrective Action Request
GHG	Greenhouse gas(es)
GJ	Giga joule
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
LOA	Letter of Approval
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
O&M	Operation and maintenance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
GS	Gold Standard
TAC	Technical Advisory Committee

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Appendix A: Validation Protocol

## 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*The DOE E-0013, „TÜV Rheinland Japan Ltd. ( TÜV Rheinland )” has performed a validation of the “Efficient Cooking with Ugastoves”-project in Uganda. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as the Gold Standard Validation & Verification Manual for Voluntary Offset Projects and criteria given to provide for consistent project operations, monitoring and reporting. The review of the project design documentation and the subsequent follow-up interviews have provided TÜV Rheinland ( the verifier ) with sufficient evidence to determine the fulfilment of stated criteria. After resolving of the raised corrective action and clarification requests TÜV Rheinland has considered to submit the request for registration for the project activity to Gold Standard Foundation.*

*The project is a voluntary carbon offset project under the Gold Standard and no approval of the host country Uganda is required. The Designated National Authority of the host country Uganda was asked to endorse the project and confirm that the project assists Uganda in achieving sustainable development. The full support for the project as a case study on voluntary/offset market was verbally declared during the local stakeholder consultation.*

*The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Uganda. The project correctly applies the methodology “Methodology for Improved Cook-Stoves and Kitchen Regimes”, version 01.*

*By application of improved fuel-efficient charcoal stoves for domestic and restaurant use, improved fuel-efficient residential wood stoves and improved fuel-efficient institutional wood stoves the project will reduce fuel consumption, which results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*The total emission reductions from the project are estimated to be on the average 85,615 tCO<sub>2</sub>e per year over the first 7-year crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change. Adequate training and monitoring procedures have been implemented.*

*In summary, it is TÜV Rheinland’s opinion that the “Efficient Cooking with Ugastoves”-project in Uganda as described in the PDD version 07 of 24 March 2009 meets all relevant requirements for Voluntary Offset Projects under the Gold Standard and all relevant host country criteria and correctly applies the baseline and monitoring methodology “Methodology for Improved Cook-Stoves and Kitchen Regimes”, version 01. After all corrective action and clarification requests could have been resolved the verifier TÜV Rheinland recommends to submit the request for registration for the project “Efficient Cooking with Ugastoves” as a Gold Standard VER project activity directly to Gold Standard Foundation (GS-TAC).*

## 2 INTRODUCTION

JP Morgan Ventures Energy Corporation has commissioned TÜV Rheinland to perform a validation of the “Efficient Cooking with Ugastoves”– project in Uganda (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board and the requirements for Voluntary Offset Projects under the Gold Standard.

### 2.1 Objective

The purpose of a validation is to have an independent third party to assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects as well as Voluntary Offset projects under the Gold Standard and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified emission reductions (VERs).

### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the requirements for Voluntary Offset Projects under the Gold Standard and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual /31/ and the GS-VER-VVM /12/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of VERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

## 3 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

#### I Desk Review Phase

- Contract Review
- Publication of PDD for GSP on TÜV Rheinland Website  
([http://www.tuv.com/de/clean\\_development\\_mechanism\\_cdm\\_.html](http://www.tuv.com/de/clean_development_mechanism_cdm_.html))
- Document Review of the PDD
- Compliance check of the PDD with applied baseline and monitoring methodology and methodological tools
- Assessment of Additionality of proposed VER Project
- Assessment of the PDD according to its consistency, transparency and trueness
- Receipt of a copy of Pre-Feasibility Assessment of Gold Standard from project proponent

#### II Follow-Up Interviews Phase

- Issue of First List of CARs and CLs
- On-Site Assessment of project site (Interview with project developer, consultant and local stakeholders)

#### III Resolution of Outstanding Issues

- Issue of Final List of CARs and CLs considering the first response to the First List of CARs and CLs in combination with a draft validation report
- Receipt of a copy of the response of the project proponent to the Pre-Feasibility Assessment of Gold Standard
- Resolving of CARs and CLs and other open issues
- Issuance of Final Validation Report

The project applies the GS-Methodology for Improved Cook-stoves and Kitchen Regimes V.01 “Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes”. This methodology was developed for the Gold Standard Foundation by JP Morgan Climate Care for large-scale projects disseminating improved cook-stoves. The relevant CDM-methodology AMS-II.G. “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass” is not applicable, because the scale of the project activity is exceeding the threshold for small-scale project activities of type II “Energy efficiency improvement projects”. The used GS-Methodology, even not an approved CDM methodology, and its application is justified to be the best available methodology at the time of PDD preparation.

The validation process was guided by a validation checklist, which aims to ensure a transparent validation process.

The review of documentation includes the compliance check with the methodology used in the carbon emissions reduction calculation, and assessment of the project baseline and project additionality.

### 3.1 Desk Review of the Project Design Documentation

The team has for this assignment decided to check all factors and issues with the same emphasis, but has also during its preparations identified the key risks which might lead to lower emission reductions than projected in the project design and has determined compliance with GS-VER standard and the applied GS-Methodology and other relevant criteria:

- Assessment of the completeness and appropriateness of the submitted project design document (PDD)
- Assessment of the project's contribution to sustainable development in the host country
- Assessment of the soundness of the project baseline
- Assessment of the completeness and appropriateness of the project monitoring plan
- Assessment of the planned operational management and technical/ engineering practices as well as quality assurance procedures to be applied by project proponents
- Assessment of the methodology and the assumptions made to estimate the emission reductions produced over the project's selected crediting time
- Assessment whether social and environmental impacts of the project are sufficiently addressed

The basis for the validation has been version 1 of the project design document (PDD) dated 19 March 2008; version 2 of the project design document (PDD) dated 22 August 2008; version 3 of the project design document (PDD) dated 30 September 2008, version 4 of the project design document (PDD) dated 30 November 2008, version 5 of the project design document (PDD) dated 23 December 2008, version 6 ( 090115) of the project design document (PDD) dated 15 January 2009, version 7 ( 090324 ) dated 24 March 2009, including Annexes 1 – 5; the pre-feasibility assessment of Gold Standard Foundation to the retroactive registration request: Efficient Cooking with Ugastoves, Uganda of 26 May 2008; the response of JPMorgan Climate Care of 25 July 2008 to Gold Standard Foundation; the initial list of CARs and CLs of the validation team of TÜV Rheinland of 1 June 2008 and 22 July 2008; the response of JPMorgan Climate Care to TÜV Rheinland of 29 September 2008 and 23 December 2008, and other relevant information listed in the table below and the GS-Methodology for Improved Cook-stoves and Kitchen Regimes V.01 “Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes”.

The project operator in the host country Ugastoves Limited has in addition supplied the validation team with instructions from its management system as well as detailed raw data needed for the crediting period. The review of documentation includes the validation of the methodology used in the carbon emissions reduction calculation, and assessment of the project baseline and project additionality.

The conclusions of this assessment are listed in the chapters below.

The following table outlines the documentation reviewed during the validation:

- /1/ Pioneer Carbon Ltd and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 01, 19 March 2008
- /2/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 02, 22 August 2008
- /3/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 03, 30 September 2008
- /4/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 04, 30 November 2008
- /5/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 05, 23 December 2008
- /6/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD "Efficient Cooking with Ugastoves", Version 06 ( 090115 ), 15 January 2009
- /7/ Kitchen Survey Report of Ugastoves Improved Charcoal Stove (03.03.2008)
- /8/ Kitchen Survey Reports of Ugastoves Improved Cook-stoves (22.08.2008)
- /9/ Statistical Analysis of Fuel Consumption on Charcoal Ugastoves 2006 (04.05.2008)
- /10/ Statistical Analysis of Fuel Consumption on Wood-burning Domestic Ugastoves 2006 (07.03.2008)
- /11/ Statistical Analysis of Fuel Consumption on Wood-burning Institutional Ugastoves 2007 (07.03.2008)
- /12/ Wood-fuel Renewability Analysis Uganda (02.2007)
- /13/ Approved GS methodology "Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes" version 01
- /14/ CDM Methodological Tool "Tool for demonstration and assessment of additionality" version 05
- /15/ GS Validation and Verification Manual (GS V1)
- /16/ GS VER Manual for Project Developers (GS V1)
- /17/ Template of GS-VER-PDD (GS V1)
- /18/ GS Rules and Procedures Updates and Clarifications (17.12.2007)

- /19/ Prefeasibility Assessment by GS of “Retroactive Registration Request” (26.05.2008)
- /20/ ClimateCare (JP Morgan Ventures Energy Corporation), Response to GS on “Retroactive Registration Request” (22.08.2008)
- /21/ Response to auditors’ statistical comments on Ugandan Analysis (07.07.2008)
- /22/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- /23/ Minutes of Initial and Follow-up Stakeholder Meetings (16.03.2007; 14.01.2008)
- /24/ Warranty Card of Ugastoves Improved Cook-stoves
- /25/ Excel sheet of VER calculation
- /26/ FAO Global Forest Resources Assessment 2005
- /27/ FAO Spatial wood fuel production and consumption analysis of selected African countries (08.2005)
- /28/ Forestry Outlook Studies in Africa (12.2001)
- /29/ Declaration of Non-Use of ODA by United States Environmental Protection Agency (27.10.2008)
- /30/ Project brief for the proposed production of improved stoves by NEMA (13.08.2007)
- /31/ Deed of novation between “Venture Strategies for Health and Development”, “Center for Entrepreneurship in International Health and Development” and “Pioneer Carbon Limited”
- /32/ Agreement between “Center for Entrepreneurship in International Health” and “Development and Uganda Stove Manufacturers Ltd”
- /33/ Agreement between “Pioneer Carbon Limited” and “Venture Strategies for Health and Development”
- /34/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /35/ AMS-III.G. “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass” ( EB 37, version 01 of 1 February 2008 ).
- /36/ “Guidance on the Demonstration and Assessment of Prior Consideration of the CDM” ( EB 41, version 01 of 2 August 2008 )
- /37/ TÜV Rheinland, First List of CARs and CLs of 01/06/2008 and 22/07/2008
- /38/ ClimateCare (JP Morgan Ventures Energy Corporation), Feedback CARs and CLs, dated 22/08/2008
- /39/ ClimateCare (JP Morgan Ventures Energy Corporation), Feedback CARs and CLs, dated 23/12/2008

- /40/ Clean Development Mechanism Validation and Verification Manual, draft, EB 44 meeting
- /41/ GUIDANCE ON THE DEMONSTRATION AND ASSESSMENT OF PRIOR CONSIDERATION OF THE CDM. EB 41 meeting
- /42/ GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD) AND THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES (CDM-NM), Version 07, EB 41 meeting
- /43/ The Republic of Uganda „CLIMATE CHANGE UGANDA NATIONAL ADAPTATION PROGRAMMES OF ACTION”
- /44/ WHO “Evaluation of the costs and benefits of household energy and health interventions at global and regional levels” (2006 )
- /45/ “Biomasse als Energieträger in Entwicklungsländern – eine umweltökonomische Analyse am Beispiel Uganda“, Diplomarbeit Markus Knöpfle, Universität Augsburg
- /46/ United Nations Environment Programme and the International Institute for Sustainable Development “Connecting poverty and ecosystem services: A series of seven country scoping studies – Focus on Uganda” (2005)
- /47/ Interventions to Reduce Child Exposure to Indoor Air Pollution in Developing Countries: Behavioral Opportunities and Research Needs  
Brendon R. Barnes, *Health and Development Research Group, Medical Research Council of South Africa, Johannesburg, South Africa*
- /48/ UGANDA BUREAU OF STATISTICS „Uganda National Household Survey 2002/3”
- /49/ UGANDA BUREAU OF STATISTICS „UGANDA NATIONAL HOUSEHOLD SURVEY 2005/2006“
- /50/ Assessment by GS of “6-week registration review period”; regarding comments and requests for clarification/corrective action” (18 March 2009)
- /51/ ClimateCare (JP Morgan Ventures Energy Corporation) and Centre for Entrepreneurship in International Health and Development (CEIHD): PDD ”Efficient Cooking with Ugastoves”, Version 07 ( 090324 ), 24 March 2009
- /52/ “Emissions of greenhouse gases and other airborne pollutants from charcoal making in Kenya and Brazil, David M. Pennise,Kirk R. Smith, Environmental Health Sciences, University of California, Berkeley, California. Journal of Geophysical Research Vol 106 October 27 2001”
- /53/ “Charcoal Production and Licensing in the districts of Apac, Kamuli, Kayunga, Kiboga, Kiruhura, Luwero, Msindi, Mityana, Mpigi, Mubende, Mukono, Nakaseke, Nakasongola and Wakiso”, authored by Richard Kisakye, Ministry of Energy and Mineral Development – Republic of Uganda
- /54/ AMS- III.K. Avoidance of methane release from charcoal production by shifting from traditional open-ended methods to mechanized charcoaling process, Version 04
- /55/ AM0041 “Mitigation of Methane Emissions in the Wood Carbonization Activity for Charcoal Production”, Version 01

### 3.2 Follow-up Interviews with Project Stakeholders

*Identify any personnel who have been interviewed and/or provided additional information to the presented documentation.*

Date	Name	Organization	Topic
29.05.2008 30.05.2008 06 – 12/08 01-03/09	Tom Owino  Dr. Adam Harvey	JP Morgan Ventures Energy Corporation	<ul style="list-style-type: none"> <li>- Environmental impacts</li> <li>- Project technology</li> <li>- Status of project</li> <li>- Stakeholder consultation process</li> <li>- Baseline determination and emission reductions</li> <li>- Monitoring plan</li> <li>- Monitoring plan of sustainable indicators</li> <li>- Additionality</li> <li>- Kitchen Test and Kitchen Survey</li> </ul>
29.05.2008 30.05.2008	David L. Mukisu Muhammed Kawere	Ugastoves Ltd.	<ul style="list-style-type: none"> <li>- Local stakeholder process</li> <li>- Background information</li> <li>- Personnel Training</li> <li>- Initial checking of daily monitoring records and spreadsheets</li> </ul>
29.05.2008 30.05.2008	Sholar Foods & Take Away A-Y Hardware – Makindye Ms. Joy Zzimule Mini Price Supermarket Entebbe Road Kyelima General Hardware, Mr. Njagala, Mohammed	Stove distributors	<ul style="list-style-type: none"> <li>- Price of stoves</li> <li>- Sales records</li> <li>- Warranty system</li> <li>- Baseline scenario (Cooking with LPG, electricity, other stove types)</li> </ul>
30.05.2008	David L. Mukisu Gayaza Cambridge College of St. Mbaaga Mr. Lwanga, Stephen Mr. Zziwa, Vincent	Ugastove Institutional wood stove user	<ul style="list-style-type: none"> <li>- Institutional Wood Stove of Ugastove for approx. 700 students</li> </ul>

30.05.2008	Mrs. Kellen Namusisi, School of Public Health	Local consultant	- Kitchen Survey and Kitchen Test - Monitoring
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### 3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a GS-VER project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of two tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Efficient Cooking with Ugastoves"-project in Uganda is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM or GS-VER criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- mistakes have been made with a direct influence on project results;
- CDM / GS-VER and/or methodology specific requirements have not been met; or
- there is a risk that the project would not be accepted as a GS-VER project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

Findings established during the validation may be that:

- the validation is not able to obtain sufficient evidence for the predicted emission reductions or part of the reported emission reductions.
- the validation has identified material misstatements in the predicted emission reductions. Emission reductions with evident material misstatements shall be discounted in order to achieve a conservative and reliable result during the verification period.

A forward action requests (FAR) may be issued, where:

- the actual project monitoring and reporting practices require attention and /or adjustment for the next consecutive verification period, or
- an adjustment of the monitoring plan is recommended.

In the context of FARs, risks may be identified, which may endanger the delivery of emission

reductions in the future, i.e. by deviations from good reporting or management procedures. As a consequence, such aspects should receive a special focus during the next verification.

<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>		
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.</i>

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), or a <b>corrective action request (CAR)</b> due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</b>			
<b>Draft report clarifications and corrective action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation conclusion</b>
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

**Figure 1 Validation protocol tables**

### 3.4 Technical Quality Control

The draft validation report including the validation findings is based on the results of the desk-review, study of background information and the results of the on-site assessment. Comments from the global stakeholder consultation process were invited. No comment from the global stakeholder consultation process has been received. The final validation report will undergo a technical review before submission to the project participants and subsequent requesting registration of the project activity with Gold Standard Foundation.

The technical review will be performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

### 3.5 Validation Team

Role/Qualification	Last Name	First Name	Affiliation
GHG auditor trainee	Cui	You	TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Germany
Team leader Sectoral scopes 1,2,3	Seidel	Kurt	TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Germany

The CV of each individual validation team member is available upon request.

## 4 VALIDATION FINDINGS

The main findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the complete list of results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

### 4.1 Participation Requirements

*Referring to Part A, Annex 1 of the PDD.*

The project participant in the host country is the Ugandan private company Ugastoves Limited. The international carbon consultant for this project is ClimateCare (JP Morgan Ventures Energy Corporation) in cooperation with the Centre for Entrepreneurship in International Health and Development (CEIHD). The host Party Uganda meets the requirements to participate in the CDM. Anyhow, the project is being implemented in Uganda as a voluntary carbon project. As such, a formal host country approval is not required. The Ugandan DNA has been officially informed of the project and was a participant in the Main Stakeholder Consultation meeting on the project, where the Uganda Government's verbal endorsement of the project was recorded in the minutes.

It is deemed reasonable to close therefore the related corrective action and clarification requests and go ahead with the voluntary offset project “Efficient Cooking with Ugastoves” as GS-VER project. In case the general framework will change a conversion into a CDM project might be feasible. Therefore it is obvious that a participating Annex I party could not yet be identified at this stage of validation.

The DNA of the prospective Annex I country involved could therefore not yet officially authorize a project participant, which is not requested for voluntary carbon offset projects.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 02(TR):** Harmonise information about project participant, i.e.

- “Pioneer Carbon Ltd. (PCL) or JP Morgan Climate Care ( Table in A.3, Annex 1, Footnote )
- Centre for Entrepreneurship in Health and Development ( CEIHD ) (Table in A.3, Annex 1, Footnote )
- Uganda Stove Manufacturers Limited ( UGASTOVE ) is no project participant in Table in A.3 and Annex 1, but UGASTOVE is mentioned as major host country project participant in the PDD

Clarify role of CEIHD/USA. Clarify “Party B (Party-buyer)”

**Conclusions:** The PDD, version V 3 has been revised accordingly. CAR 02(TR) is closed.

**CAR 12(TR):**

Party involved wishes to be considered as project participant has been indicated as “Yes”. The project is voluntary; no Kyoto Party is involved and participates in the project.

**Conclusions:** The PDD, version V 3 has been revised accordingly. CAR 02(TR) is closed.

**CL 01(TR):** Project approval by the Parties involved: Clarify whether formal approval has been given.

**Conclusions:** The PDD, version V 3 is clarifying this issue under A.3., that the project is a voluntary carbon offset project and no host country approval is required. However the DNA of Uganda has been informed officially and was throughout Mr. Philip Gwage present at the main stakeholder consultation meeting, stating his full support for the project as a case study on voluntary/offset market under Gold Standard according to /20/. CL 01(TR) is closed.

## 4.2 Project Design

*Referring to Part A and B of the PDD.*

Title of project activity: *Efficient Cooking with Ugastoves*

Project Participants: *Project developer: JP Morgan Ventures Energy Corporation; Project partner: Centre for Entrepreneurship in International Health and Development (CEIHD); Local partner in the host country: Ugastoves Limited*

Location of the project activity:

*The project is located primarily in Kampala and other urban, peri-urban and rural areas of Uganda.*

The project has its origin in former awareness campaigns for improved cooking stoves in Uganda in order to protect its forest resources. UCODEA began operations in 1997. It was registered as a legal entity in Uganda in 2000. However, Mr. Kawere Muhammad's stovemaking experience dates back to the early eighties. In 2004 UCODEA began working with CEIHD. In 2005, both organizations identified the possibility of leveraging carbon finance to sell stoves and reduce carbon emissions. The organization became the Uganda Stove Manufactures Limited, or Uga Stove, in 2007, a Certificate of Incorporation with No. 92275 has been issued on 21<sup>st</sup> of July 2007 by the Registrar of Companies of the Republic of Uganda. The relevant certificate as well as payment slip to the City Council of Kampala for the business registration has been provided to the validation team for evidence.

There are two phases of the project. Phase I of the project began in 2004 ended in August 2006. This phase was primarily a set up phase which elaborated stove design, trained producers and developed a distribution network for improved cooking stoves for domestic use and institutional stoves for applications in larger kitchens like in schools.

Phase II of the project started in October 2006 and will be completed in 2013. Phase II is planned to focus on developing the commercialised distribution of the stove design. The ultimate goal of the project is to facilitate a nationwide shift from inefficient exploitation of fuel wood and charcoal to sustainable and efficient use of fuel wood and charcoal respectively.

Apart from avoiding GHG emissions by reduced wood and charcoal combustion, the project also contributes to improvements in a number of areas: Avoidance of overexploitation of the forests; reduction of airborne particles emission and associated respiratory diseases; time saving in fire wood collection, reduction of purchased fuel costs, transfer of technology to people within the supply chain and end users ( households, commercial and public users ) and creation of employment opportunities within the supply chain.

The project applies the GS-Methodology for Improved Cook-stoves and Kitchen Regimes V.01 "Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes". This methodology was developed for the Gold Standard Foundation by JP Morgan Climate Care for large-scale projects disseminating improved cook-stoves. The relevant CDM-methodology AMS-II.G. "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" is not applicable, because the scale of the project activity is exceeding the threshold for small-scale project activities of type II "Energy efficiency improvement projects".

The used GS-Methodology, even not an approved CDM methodology, and its application is justified to be the best available methodology at the time of PDD preparation, as it was developed special for this project activity because of lack of an appropriate methodology at the time of the decision to develop the project as a GS-VER project.

The project involves the manufacturing and distribution of three categories of stoves:

- improved fuel-efficient charcoal stoves for domestic and restaurant use
- improved fuel-efficient residential wood stoves
- improved fuel-efficient institutional wood stoves

The improved charcoal stove reduces fuel consumption by introduction of an insulated combustion chamber which increases combustion efficiency and retains heat. The wood stoves use the well-proven rocket technology, which consists of an insulated elbow-jointed combustion chamber that increases combustion efficiency and retains heat while also raising the cooking pot to the hottest point above the flame. The institutional rocket stoves further increase heat transfer by having the cooking pot rest within a skirt.

While these stoves will significantly reduce greenhouse gas emissions, they simultaneously provide co-benefits to users and families in the form of relief from high fuel costs and reduced exposure to health-damaging airborne pollutants.

The project reduces the amount of greenhouse gases emitted through production and use of charcoal and firewood as cooking fuels, by introducing widespread use of efficient charcoal and wood stoves (including those used by institutions such as schools) which replace existing inefficient stoves primarily in Kampala, the capital of Uganda, with expanding sales throughout the country. Wood-fuels marketed in Kampala are sourced from forest areas hundreds of kilometres from the town, and as these sources become depleted, it can be reasonably expected that more distant areas of the country will be used. Currently inefficient and polluting cooking regimes are deeply established in the culture. The project aims to break this mould and move large populations away from conditions under which GHG emissions are unacceptably high, and health effects are unacceptably inhumane, for the women and children spending long hours each day in conventional kitchens. The carbon finance provides a basis for maintaining a professional commercial relationship between the user and the disseminators, while also introducing an affordable price, a quality guarantee and a warranty system. The quality assurance strategy is a major benefit of carbon finance. It has the potential to introduce a new set of quality expectations amongst consumers and so shift the critical mass of prevailing practice away from inefficient cooking. The project contributes significantly to the mitigation of climate change and the region's sustainable development and is designed as a voluntary Gold-Standard project.

The project's system boundaries are clearly defined as the geophysical area of Uganda where fuel woods are expected to be available for collection during the project duration.

The project owner has seriously considered VERs in the decision to develop the project, which has been confirmed with relevant documents in the course of the validation process, see CL03(TR). An additional verbal endorsement for the project activity as Voluntary Offset Project by the DNA of Uganda in person of Mr. Philip M. Gwage has been expressed during the second round of local stakeholder meetings.

A renewable crediting period of 7 years has been chosen for the project, starting from 1 April 2009 with a retro-active period of 2 years from 1 April 2007 until March 2009.

The emission reductions are estimated to be 85,615 tCO<sub>2</sub>eq per year in average and 599,307 tCO<sub>2</sub>eq over the first seven-year crediting period.

The project activity is a large-scale energy efficiency project with predicted average thermal energy savings of more than 180 GWh per year, which is the threshold for AMS-II.G CDM-projects according to the clarification on the threshold of thermal energy savings in AMS-II.G (F-CDM-SSCwg ver 01 SSC\_233 ) and also according to the Gold Standard, version 01(revised) with more than 60,000 tCO<sub>2</sub>e per year, based on the adaptation of GS VER SSC thresholds to CDM thresholds according to “Gold Standard Rules and Procedures Updates and Clarifications”, dated December 17th 2007 /18/.

According to actual statistical data /44/, /45/ about the number of households in Uganda, the distribution of cooking fuels and the distribution of cooking technology, it would mean that the predicted sales of domestic charcoal stoves of 173,000 pieces would be equivalent to around 29 % in urban areas of Uganda and 18 % in Uganda in total. The predicted sales figure of 6,700 pieces of domestic rocket wood stoves would be equivalent to around 3 % in urban areas of Uganda and 0.2 % in Uganda in total. There can be observed a slightly declining trend in the use of charcoal in urban areas (from 96 % in 1999/2000 down to 89.4 % in 2005/2006), but otherwise more charcoal use is observed in rural areas (from 20 % in 1999/2000 up to 22.9 % in 2005/2006).

**FAR 6(TR):** It has to be clarified in the course of the periodic verification and comparison with the actual sales numbers if the planned sales and market penetration for the different stove categories is realistic within the crediting period of 7 years with remaining 5 years under consideration of the retroactive crediting request and the current market presence in and around Kampala only, taking into account the low market penetration with improved efficient cooking stoves in rural areas, which are mainly wood stove users.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 01(TR):** The date and version number of the PDD has to be adjusted or corrected respectively (e.g. page 3 under A.1. ; page 1 – page 28 - inserted at the bottom.

**Conclusions:** The PDD, version 3 of 30 September 2008 has been revised accordingly. CAR 01(TR) is closed.

**CAR 03(TR):** Under A.4.1.2 information about “State/Province” is missing. Moreover harmonise information about “State/Province” in A.4.1.4 and Annex 1 respectively.

**Conclusions:** The physical location of the project activity is not identical with the office location of Ugastoves. The contact information of Ugastoves Limited is missing in Annex 1 of the PDD. Please fill for each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail, that includes also Ugastoves Limited.

The PDD, in the final version 7 has been revised accordingly. CAR 03(TR) is therefore resolved and closed.

**CAR 04(TR):** Harmonise information about type of cook-stoves ( 5 types domestic charcoal stoves; 3 types domestic wood stoves; different types of institutional wood stoves and time frame under consideration of retro-active crediting 2 years before 1<sup>st</sup> of April 2008.

**Conclusions:** The information about the cook-stove types has been specified. According to actual statistical data /44/, /45/ about the number of households in Uganda, the distribution of cooking fuels and the distribution of cooking technology, it has to be further substantiated that the projected sales of efficient cooking stoves of the brand “Ugastoves” is achievable in the confirmed time frame. The time frame has been revised to 1<sup>st</sup> of October 2006 instead of 1<sup>st</sup> of April 2006, which is 2 years before 1<sup>st</sup> of October 2008, based on the pre-feasibility assessment of GS regarding the request of the project proponent for retroactive crediting. The final crediting period will depend on the final approval of the registration request for the project activity.

The final PDD in its final version states as Starting Date of the First Crediting Period “1<sup>st</sup> of April 2007 or two years before Date of Registration, whichever is earlier”.

According to the communication with GS-TAC on 15/01/2009 it was confirmed, that the improved stoves installed since the project starting date ( 01/01/2006 ) and the relevant emission reductions are eligible for the generation of emission reductions within the first renewable crediting period of 7 years.

The PDD, in the final version 7 ( 090324 ) has been revised accordingly. CAR 04(TR) is therefore resolved and closed.

**CAR 06(TR):** Provide evidence for the sources of the applied numbers for 5 €, 0.16€, E120 - ? (Page 6); \$8.00 (page 9) and for the costs of different stove types and fuels as well as the mentioned numbers of indoor air quality.

**Conclusions:** The statements regarding the cost and savings of Ugastoves have been referenced in the amended PDD. Please see this analysis, again the footnotes in the PDD cite the sources.:

#### Livelihood indicator

KS family size	7.34 people (from KS)
euros/kg	0.21
Family Annual Charcoal Use	1205 kg
Charcoal use per month	100.4166667 kg
Total Expenditure per Month	46191.66667 Shs
Price per Kilo (Shs)	460 Shs (observed price in Kampala)
Exchange rate	2400 Shs/Euro 8/18/2008
Price per Kilo (euro)	0.191666667
Decrease in charcoal consumption	29% Source: KPT
Charcoal saved	345.835 Kg
	Shs Euro
Charcoal savings	159,084 66.28504
Stove cost	15,000 6.25
Total Annual savings	144,084.10 60.03504
Household income	1600000 666.6667
Effective increase in income	9% 9%

The above data are considered as plausible compared with own background investigations. CAR 06(TR) is resolved.

**CAR 14(TR):**

Typing mistake: "...Sizes 2 to 6 Adj (KS) is the 0,83..." No Size 6 has been indicated in the project.

**Conclusions:**

The PDD has been amended accordingly. There are the sizes 1 – 5 manufactured with the brand name "Ugastoves", see the amended version 3 (dated 30 Sept 2008).

CAR 14(TR) is resolved.

### **4.3 Baseline Determination**

*Referring to Part B and Annex 2 of the PDD.*

**Background Information:**

Dry conditions and prolonged droughts create conducive conditions for spread of wild fires thus destroying forests with serious consequences. Increased population growth has also led to increased deforestation because of increased demand for food and fuel.

Firewood provides around 96% of Uganda's energy needs. Increased electricity tariffs lead to increased demand for fuel wood and charcoal, leading to increased soil erosion, damage to vital watershed, flooding and silting of rivers and lakes.

Forestry makes a substantial contribution to Uganda's economic development. It is estimated that forestry contributed about 6% to the national GDP in 1997. The forestry sector creates significant employment opportunities now estimated at an equivalent of about one million jobs (SOER, 2000/2001).

Forest is of high economic importance due to its household uses. The energy sector is characterised by a heavy dependence on bio-mass resources, which provide more than 90 percent of the national energy needs. Uganda's forest industry has undergone changes attributed to population pressure. Biomass is the dominant energy resource for households and small scale industries like lime, brick and tile making and a number of agro-based industries like tea, tobacco and fishing. The two major natural forest reserves, Budongo in the West and Mabira in the centre have experienced over exploitation due to increased demand for timber and fuel wood.

Some portions of the forest reserves, including government owned ones, have been exhausted by farmers and replaced with crops. The 7.8% growth rate in the forest industry represents the efforts of the private sector and individuals to plant trees as a source of timber and fuel. Production or consumption of forests' raw material poses a big threat to environment and climate. The total wood production rose from 20.4 metric tonnes in 1995 to 23.9 metric tonnes in 1999. This growth reflects demand for these products in construction, and fuel supply accruing to population pressure.

The deforestation rate in Uganda is estimated to be 55,000 ha per year, based on habitat change from 1990-1995. Other estimates push the figure higher to between 1.1% and 3.15%

per year. The majority of the forest loss has occurred outside of protected areas. Approximately 25 million tons of wood are consumed annually in Uganda, which translates to about 1.1 ton per capita per year. The majority of that wood is used as household firewood (65%), charcoal (16%) and commercial and industrial firewood (14%). The trend in loss of forest cover shows an accelerated rate of deforestation in Uganda compared to a number of other countries. The National Biomass Study Project (FD,MWLE 2003) estimates that per capita forest area will decline from 0.3 hectare in 1991 to 0.1 hectare in 2025.

The table below show actual figures from the Global Forest Resources Assessment 2005:

FAO (2005): reduction of forest cover

Forest							Other wooded land		
Area			Annual change rate				Area		
1990	2000	2005	1990-2000		2000-2005		1990	2000	2005
1000 ha	1000 ha	1000 ha	1000 ha/yr	%	1000 ha/yr	%	1000 ha	1000 ha	1000 ha
4.924	4.059	3.627	-86	-1,9	-86	-2,2	1.404	1.235	1.150

Growing stock		Growing stock per hectare	
(1000 m <sup>3</sup> /yr)		(m <sup>3</sup> /ha/yr)	
1990-2000	2000-2005	1990-2000	2000-2005
-3.730	-3.800	n.s.	-0,02

The table below shows that nearly all households use wood fuel. Charcoal use increased from 14 percent in the 1999/00 survey to 18 percent in 2002/03. Use of electricity and paraffin for cooking is still very low (4 percent). The biggest part of the population still use firewood though this has gone down from 84 percent in 1999/00 to 78 percent in 2002/03.

**Table: Households by Fuel Used for Cooking (%age)**

Year	1999/2000			2002/2003		
Energy Source, type of fuel	Rural	Urban	Total	Rural	Urban	Total
<b>Total</b>	100	100	100	100	100	100
<b>Fire wood</b>	96	20	84	90	22	78
<b>Charcoal</b>	4	70	14	8	67	18
<b>Paraffin</b>	0	5	1	1	5	2
<b>Electricity</b>	0	3	1	0	3	1
<b>Other</b>	0	2	0	1	3	1

Other includes gas ( LPG ), cow dung and other energy sources

Source: Uganda National Household Survey 2002/2003, UBOS (2004): URL: [www.ubos.org](http://www.ubos.org)

The following table from the Uganda National Household Survey 2005/2006 reveals that 78 percent of the households depended on firewood for cooking and 18 percent on charcoal. Overall, 96 percent of the households depended on wood fuel for cooking purposes which is a challenge to achieving the MDG targets and promotion of environmental sustainability. A very small proportion of households (less than 1%) used electricity as the main source of energy for cooking. Variations in residence show that charcoal was mainly used in urban areas (66%) while firewood was more prominent in rural areas (89%). Charcoal is preferred by the on average more wealthier urban population in comparison to fire wood and is considered as a more modern, cleaner form of energy.

**Table: Distribution of Households by Cooking Fuel and Residence (%)**

Residence	2005/2006 Cooking Fuel					Total
	Firewood	Charcoal	Kerosene	Electricity	Other*	
Rural/Urban						
Rural	89.4	8.2	0.8	0.1	1.6	100.0
Urban	22.9	66.1	3.5	0.8	6.8	100.0
Region						
Kampala	5.8	77.7	5.2	1.4	9.9	100.0
Central	70.2	24.5	2.0	0.2	3.2	100.0
Eastern	86.1	11.4	0.7	0.1	1.7	100.0
Northern	88.3	10.7	0.4	0.0**	0.7	100.0
Western	89.5	7.8	0.5	0.1	2.1	100.0
Uganda	77.8	18.2	1.2	0.2	2.5	100.0

Other\* includes LP gas, saw dust, biogas

\*\* Its not zero, but the percentage is less than 0.1 %

Source: Uganda National Household Survey 2005/2006, UBOS (2006): URL: [www.ubos.org](http://www.ubos.org)

The survey results reveal also that the most widely used cooking technology were the traditional three stones that accounted for 73 percent and the Sigiri (traditional metal charcoal stove) followed with 15 percent. Only 9 percent of all households used Improved Charcoal and Firewood stoves.

**Table: Distribution of Type of Cooking Technology by Region (%)**

	2005/2006 Cooking Technology					
	Kampala	Central	Eastern	Northern	Western	Uganda
Three Stones	6.1	68.1	84.2	72.1	85.8	72.7
Open charcoal stove	72.6	20.3	10.8	2.8	6.6	14.8

Improved stoves	4.8	6.6	3.1	23.2	5.6	8.7
Paraffin stove	5.0	1.8	0.5	0.1	0.3	1.0
Other*	11.6	3.3	1.5	1.7	1.8	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

\* includes electric plate, gas stove and saw dust stove

Source: Uganda National Household Survey 2005/2006, UBOS (2006): URL: [www.ubos.org](http://www.ubos.org)

In summary it can be stated, that firewood and charcoal (woodfuel) and agricultural wastes are the primary source of energy in Uganda, which means a downward trend on the so-called “energy ladder” , which is resulting in a poorer cooking performance combined with harvest losses caused by missing nutrient backflows into the ground. \*)

\*) BARNES, D.F. et al. (1994) : What makes people cook with improved biomass stoves? A comparative international review of stove programmes. World Bank Technical Paper, No. 242, Energy Series, Washington D.C., S. 1.

The majority of the households (71%) used in addition to the cooking purpose Tadooba ( a locally made simple paraffin candle ) for lighting purposes contributing to indoor pollution through smoke and soot it emits, while 14 percent used kerosene lanterns. Only 11 percent of households used electricity as the main source of lighting. Variations by residence show that the proportion of households using electricity in rural areas was very small (4%). Even in urban areas, less than half of households used electricity as the main source of lighting. Electricity for lighting was least used in the Northern region (1%) and used most in the Central region (15%).

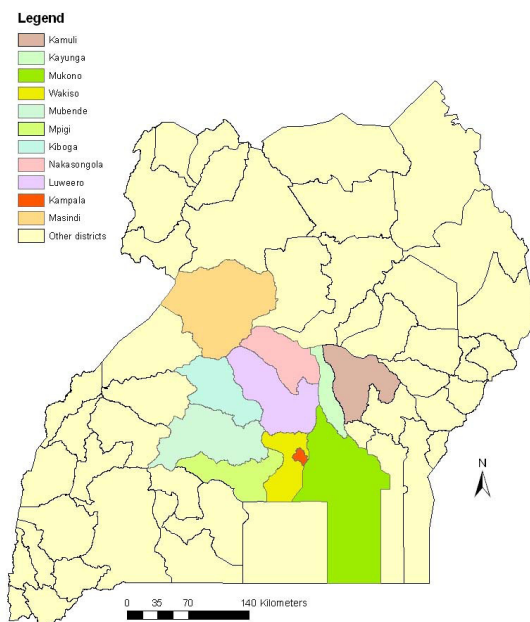
Uganda’s average household monthly expenditure rose from Shs. 134,100 to Shs. 139,300, representing a real increase of 4 percent within a period of almost three years. The increase is mainly driven by the observed increases in the rural areas, while the per household expenditure remained more less the same for the urban areas over the same period. In nominal terms, we estimate mean consumption per capita in the 2002/03 survey to be 29,899 Uganda shillings per person per month. In nominal terms, the estimated mean consumption per capita in the 2005/06 survey was Shs 39,829 per person per month compared to Shs 29,899 in 2002/03. The central region has the highest expenditure on rent, fuel and power with 20 percent, this is followed by eastern and western with 17 percent each very close to northern with 16 percent.

Various literatures from own background investigation and summarised in the PDD and annexes, have been assessed in addition by the validation team, which confirms the above described situation in Uganda, that the majority of urban households use charcoal, some 3.12 million tonnes (2.31 million toe) annually (HEDON Household Energy Network 2004). Charcoal and wood are transported into the cities from rural areas where it is sold at many small outlets (HEDON Household Energy Network 2004). For the urban poor, biomass is the main source of fuel energy, but there is increasing use of charcoal (HEDON Household Energy Network 2004). Liquefied petroleum gas (LPG) and electricity are used by only a small minority for cooking (HEDON Household Energy Network 2004). Urbanization increases deforestation by increasing the demand for charcoal production, the primary fuel among urban dwellers. Charcoal manufacturing accelerates deforestation more than firewood, because, unlike firewood which can be obtained from dead branches and stems in the rural countryside, it involves felling live trees (Kanabahita 2001). In conjunction with urbanization, migration and industrialization also contribute to deforestation.

Prevention of human exposure to indoor smoke is another important aspect of the current household energy systems of Uganda. When charcoal or firewood is burnt on simple traditional stoves, they often do not combust completely and the result is a high level of emissions (including particulates) which can cause high levels of indoor air pollution when combined with poorly ventilated conditions. This indoor air pollution can have a severe impact on health. The respiratory and immune systems can be damaged by the particulates from smoke. The women gathering wood spending several hours daily, incur cuts, bruises, sprains, fractures, skin irritation, allergic reactions, insect and snake bites, and other injuries.

### Baseline Determination:

The baseline determination is transparent and reasonable following the guidance from the applied GS-Methodology for Improved Cook-stoves and Kitchen Regimes V.01 “Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes”. The project boundary is defined as the kitchens used by the project population (Ugastove purchasers); this is distinct to the Reachable Fuel Collection Area, which is the geographical area of Kampala with step-wise expansion to whole Uganda where fuel-woods can reasonably be expected to be collected throughout the period of the project.



Source: KNÖPFLE, M. (2004): A Study on Charcoal Supply in Kampala – Final Report, MEMD, GTZ, Kampala, Uganda, S. 72.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 07(TR):** Show more evidence for fossil fuel consumption and their conservativeness ( raw data ) during the baseline period for more than 3 days as a representative sample period besides of the summarized reports. With regard to the planned further dissemination of the cooking stoves into rural areas outside of Kampala it has to be considered, if also cooking fuels can be grouped into categories ( e.g. *advanced* <electricity and bottled - LPG or natural gas>, *intermediate*<kerosene and charcoal, jatropha oil, biogas, ethanol, gelfuel >, and *basic*<wood, dung, thatch, and straw> ).

#### **Conclusions:**

All numerative tables in the PDD reflect emission reductions taking into account the use of LPG and paraffin as secondary fuels by some customers. Details of the findings of the Kitchen Survey with respect to use of fossil fuels as secondary fuels are given in the Annex 5.1 section 5.3.

While the Kitchen Tests in 2006 did not measure fossil fuel use directly the Kitchen Survey estimated its use and a conservative adjustment to the Kitchen Test results was made to account for the Kitchen Survey findings.

The methodology has included an evolving baseline determination through periodic kitchen surveys and kitchen tests, taking into account future development of energy supply and technology development and cooking habits and behaviour in the domestic cooking sector, which is deemed to be conservative and more accurate than using a certain discount factor where the leakage and the baseline is hard to assess. CL 07(TR) is closed.

**CL 08(TR):** Clarify whether there are any major risks linked to the baseline, e.g. determination of non-renewable biomass fraction.

#### **Conclusions:**

All aspects of the baseline including non renewable biomass (NRB) were assessed conservatively in order to avoid any risk of over-estimation of emission reductions. An updated analysis of NRB has been provided in the amended PDD which further ensures conservativeness and which revises the previous assessment on the basis of more up-to-date statistical data collected and published by the FAO. CL 08(TR) is closed.

**CL 8(GS):** *Please make specific references to the various sections of the methodology considered when describing the assumptions retained for the baseline scenario and include the information now provided in Annex 2 into the most relevant sections among B.2, B.3 and B.5 of the PDD.*

#### **Conclusions:**

The PDD has been amended accordingly. Footnotes have been included in section B.2 to refer assumptions to relevant sections of the methodology. In order to retain readability and clarity, the full text of Annex 2 has been included in section B5 rather than divide it between B.2, B.3, and B.5.

**CL 9(GS):** *In section B.3, please make systematic references to the Kitchen Survey (e.g. determination of the adjustment parameters) and to the various statistical analyses conducted based on the results of the Kitchen Tests in order to derive the emission reduction data for the various considered clusters.*

**Conclusions:**

The PDD has been amended accordingly. Footnotes have been included in section B.3 to refer to the Kitchen Survey analysis and to the statistical analysis contained in the Kitchen Test report.

**CL 10 (GS):** *Measurement campaigns - Please provide further justification showing that a single measurement campaign (3-day pre-installation and 3-day post-installation) in the year is sufficiently robust given the local circumstances – weekly (weekends) and seasonal variations.*

**Conclusions:**

The Kitchen Tests were performed during the summers of 2006 and 2007 between June and August. The single measurement campaign is justified and conservative because it was performed in lower fuel use seasons (not near Christmas or Easter) and avoided weekends, which is when families typically cook more. The KT results are also conservative in that results from households with unusually high fuel savings were excluded from analysis as outliers. The source of these outliers were non-typical, high volume, cooking events such as funerals or graduation celebrations.

**CL 11(GS):** *Statistical test - Please discuss why the sample data set is sufficiently close to a normal distribution for the t-test to be robust enough, and for the use of another statistical method that do not require the normality hypothesis such as the Wilcoxon test to not be necessary. The sample used for the Kitchen Test conducted for wood-fired cook-stoves and institutional stoves is of respectively 13 and 9 stoves. This is too little to be considered statistically significant – please either very significantly discount the considered average emission reduction factor or plan for a complementary measurement campaign in order to expand the sample.*

**Conclusions:**

Response from Dr. T. J. Heaton, Department of Statistics, University of Sheffield  
July 7, 2008 on behalf of the project proponent JP Morgan ClimateCare:

„ .... It is my opinion that in this case the Wilcoxon test is not appropriate in this case since, while it is described as non-parametric, it still requires the assumption that the data come from a symmetric distribution and tests for a shift in the median rather than the mean. While if the data are symmetric then this median will be equal to the mean, if the data are skewed then this

will not be the case. In analysis of our results it is the mean fuel saving that is of interest, we are not concerned with the median. ....

.....I would agree that ideally a larger sample size would have been used in order to check these assumptions in particular that of linearity in the case of the institutional schools but since there were very few schools in the region for practical considerations this may not be feasible. I would however recommend that these issues be noted and a follow-up study to check these assumptions be considered.....”

### **Conclusion Validation Team:**

#### **FAR 1(TR):**

In order to achieve a more conservative and reliable result without any material discrepancy, the periodic kitchen surveys and kitchen tests should be executed in accordance with relevant standards and guidelines like the World Bank’s Greenhouse Gas Assessment Handbook or the ISO 14064/14065 standard regarding the minimum sample size and the level of assurance required.

## **4.4 Additionality**

*Referring to Part B of the PDD.*

There has not been any public announcement of the described project activity going ahead without VERs. VER revenue is the only external source of funding, the project activity could not go ahead without upfront payment from the future VERs, which has been confirmed during on-site assessment and follow-up interviews.

The main purpose of the project is to reduce the consumption of firewood with the improved design of cooking stoves with better combustion efficiency and insulation to prevent heat from escaping. There are around 1 million of families relying on charcoal and around 4 million families in Uganda relying on firewood for daily cooking in Uganda.

The improved cookstoves will contribute to reduce the consumption of charcoal and firewood. In the absence of the project, the rate of firewood chopping for cooking or charcoal making would continue. The use of the improved efficient charcoal and wood stoves of the brand “Ugastoves” will result in emission of less airborne particles and as a subsequence an improvement of the living conditions of the users and in a reduction of charcoal and firewood consumption throughout the design-based better combustion efficiency, besides of the facts, that the use of more efficient cook stoves is narrowing the gap between the rising fuel wood needs of a growing population and the diminishing forest resources. In the absence of the project, the rate of firewood chopping for cooking or charcoal making would continue.

This country analysis for Uganda summarized under chapter 4.3. concludes that the current charcoal production practices are not sustainable. The natural regeneration of forests is far too slow to produce enough fuelwood to cover the demand.

This concluded that the natural forests of Uganda, host to immense biodiversity kept on reducing by around 2%/year since the 1990s, or an average loss of 86,000 ha per year from 1990-2005.

The project was supported with the kitchen tests and kitchen field surveys and further research on the additional impact of the market entry of the new improved cooking stoves on fire wood and charcoal saving. This assessment concluded positively on project additionality.

Prior to the implementation of the project, the new technology was not required by any law or regulation, it was in no way representing common practice in Uganda, nor was it representing the least cost option for cooking. Hence, the project can be considered additional under the applied additionality criteria.

The additionality of the project has been established using the “Tool for the demonstration and assessment of additionality” version 05 approved by the CDM-EB.

TÜV Rheinland was able to verify that the incentives from VER revenue were seriously considered prior to the start of the project activity as substantiated with further evidence. Related open issues could be clarified, see CL3(TR) to CL6(TR) below.

In summary, it is sufficiently demonstrated that the project is not a likely a baseline scenario and that emission reductions occurring from this will hence be additional.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 05(TR):** According to the guidelines of Gold Standard Foundation the latest approved version of the “tool for the determination and assessment of additionality” should be used, which is version 05 and not version 03.

**Conclusions:** The additionality assessment of proposed project has been updated according to CDM Tool “Tool for the determination and assessment of additionality” version 05. CAR 05(TR) is closed.

**CAR 09(TR):** The baseline scenario should takes into account additionally the development of fuel prices in Uganda, the availability of capital in Uganda as well as the current situation concerning applied technologies in the different urban, peri-urban and remote areas, where stoves are used in Uganda.

**Conclusions:** This has been done under section A.4.4 (Determination of additionality). The PDD has been revised accordingly. CAR 09(TR) is closed.

**CL 05(TR):** Clarify the identified barriers as follows:

#### **Investment barriers**

- Clarify on which basis \$8.00 was identified as threshold for domestic charcoal stoves and which values apply for domestic wood stoves and institutional wood stoves.
- Please substantiate the statement that no banks are willing to provide a loan for the project activity and payment schemes with more evidence.

#### **Technological barriers**

- Provide more evidence for the statements to the technology barriers and to the prevailing practice.

Provide re-traceable explanations to clearly show how the early VER-project activity under consideration is affected by the barrier and provide evidence to support the relevance of the above described barriers, applying non-binding best practice examples and use also a more detailed investment barrier analysis. Provide transparent and documented evidence making specific link to the actual project activity to carry out the barrier analysis and use evidence such as national/international statistics, national/provincial policy and legislation, studies/surveys by independent agencies, industrial associations and development agencies in Uganda and Africa, etc.

**Conclusions:** This is addressed by the additionality section A.4.4 of the amended PDD. Ugastove's current efforts to increase stove distribution have been hindered by a lack of working capital for manufacturing, distribution and marketing. Because the company is currently selling below cost and therefore incurring operating losses, no bank would be willing to loan to the company as future repayment would be impossible. Basically, without carbon finance, stove distribution at the current stove price is unprofitable.

Access to any sort of loan product doesn't change the fact that the project activity is unsustainable, and that no loan to Ugastove could be repayed without carbon financing.

Individuals micro-finance loans to people who seek to buy Ugastoves are also commercially infeasible. No microfinance institution is willing to make loans of \$8 USD. In fact, a company seeking to access microcredit for a solar product has been unable to secure micro financing for a product that costs \$20 USD, and has also been unable to secure small loans of about \$100 that would serve as working capital for their sales people. The company is Barefoot Power, and their Uganda Director, Harry Andrews, can confirm this. [www.barefootpower.com](http://www.barefootpower.com).

In addition, Micro-credit organizations tend to have a strong bias towards productive vs consumptive loans. That is, they prefer to lend for purchases that will lead directly to income generating activities. Although stoves that improve public health and promote sustainable development have linkages to ones income, micro-credit organizations tend not to recognize these linkages. David Mukisa and Kawere Mohammed of Ugastove can be contacted directly to attest to the difficulties Ugastove has encountered in trying to secure direct loans.

Furthermore, evidence from interviews with end users, independent artisans and retailers, and Ugastove's staff suggests that at current prices Ugastoves are unaffordable to the majority of Ugandans whose average GDP per capita (PPP) is \$900 (reference: <https://www.cia.gov/library/publications/the-world-factbook/geos/ug.html#Econ>).

With the addition of carbon finance, efficient biomass stoves will be cheap enough for lower income households in Uganda to afford them. That is, some carbon revenues will act as a direct subsidy so that efficient stoves are cost competitive with their business-as-usual counterparts. At current prices, purchasing a Ugastove would account for a significant percent of average annual incomes and the ability for users to save this amount of money to purchase the stove is extremely difficult. Carbon finance will lower the price of stoves so that a larger spectrum of Ugandan society can afford them.

Currently charcoal Ugastoves are being sold below cost in an attempt to compete with traditional market alternatives that range in price from \$1 to \$8 (anecdotal evidence from end users and collected during the Kitchen Surveys and site visits to retailers and markets). Based on the price range of competing stoves, field observations in the summer of 2008 by a UC Berkeley PhD student in Economics and CEIHD and Ugastove, it is estimated that charcoal Ugastoves will sell in much higher volumes if the price to end users can be brought down below \$8 per stove.

In the absence of carbon finance Ugastove can only keep prices down to \$9 - \$10 by not paying staff salaries and accruing debt to vendors and the National Social Security Fund. The barrier of this unsustainable business approach is addressed by using carbon finance to pay salaries and marketing expenses to effectively subsidize the cost of stoves to an affordable price point, even though this is likely below the cost of production.

The explanation given is plausible and could be confirmed during the on-site assessment and follow-up interviews. CL 05(TR) is closed.

**CL 06(TR):** Common practise analysis: Specify “sufficient justification” and show evidence! Clarify why identified and mentioned activities have not been considered in more detail as part of the Common Practise Analysis. The Tanzanian efficient charcoal stove “jiko bora” and the KCJ (Kenya Ceramic Jiko ) stove and other stoves in neighboring countries of Uganda should be considered too ( see. Publication “Impacts of efficient stoves and cooking fuel substitution in family expenditures of urban households in Dar es Salaam, Tanzania“ ( Godfrey Alois Sanga, Gilberto D. M. Jannuzzi; September 2005 ) as well as actual studies on cook stoves ( e.g. Market Barriers to Clean Cooking Fuels in Sub-Saharan Africa: A Review of Literature; *An SEI Working Paper* of Nicolai Schlag and Fiona Zuzarte

Working Paper, Stockholm Environment Institute, April 2008 ).

**Conclusions:** This is been addressed now with the amendment of the section on additionality (A.4.4). Both the Tanzanian and Kenyan situations have been analysed. CL 06(TR) is closed.

**CAR 3(GS):** *Please provide a sensitivity analysis showing in the form of a summary table the impact of a variation of the main parameters on the assessment of the NRB, and on the calculated emission reductions (notably building on the discussion provided under point 4 of Annex 5.5). Based on this analysis and in order to be in line with the GS conservativeness principle, make sure you choose the most conservative values for the various parameters (wood density of the standing stock t/ha.year, growth rate of the wood standing stock, wood demand in t/year, wood water content, etc.), in order to lead to conservative NRB project emission reductions, in line with the GS conservativeness principle.*

**Conclusions:** The PDD has been amended accordingly (see Annex 2). The assumptions are plausible and comprehensible, based on latest public data /23 /, resulting in a conservative value of 91 %, which is the lowest of the available data in the sensitivity analysis.

## 4.5 Monitoring

*Referring to Part D and Annex 3 of the PDD.*

The project applies the approved monitoring methodology for Improved Cook-stoves and Kitchen Regimes V.01 “Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes”. This methodology was developed for the Gold Standard Foundation by JP Morgan Climate Care for large-scale projects disseminating improved cook-stoves. The relevant CDM-methodology AMS-II.G. “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass” is not applicable, because the scale of the project activity is exceeding the threshold for small-scale project activities of type II “Energy efficiency improvement projects”. The used GS-Methodology, even not an approved CDM methodology, and its application is justified to be the best available methodology at the time of PDD preparation, as it was developed special for this project activity because of lack of an appropriate methodology at the time of the decision to develop the project as a GS-VER project.

Since the proposed project does not result in transfer of cooking stoves to the project site nor from the project site to any other location, leakage is not in place. The other potential sources of leakage described in the baseline study of the methodology will be followed throughout the project period. Fuel-switching will be continuously monitored in the monitoring Kitchen Surveys for both rural and urban sales, and the leakage factor will be re-evaluated accordingly. Thus, no leakage factor is applied for the time being.

The data presented in the monitoring report and monitoring and operational records for the entire verification period were assessed in detail by review of the detailed project documentation and production records, interviews with personnel of Ugastoves Ltd. and JP Morgan Climate Care, relevant Ugastoves producers, retailers and end users, collection of sales and production records, observation of established monitoring and reporting practices and assessment of the reliability of monitoring tools. This has enabled the validation team to assess the credibility, conservativeness and completeness of the predicted sales and emission reduction results and verify the correct application of the monitoring methodology.

Following the site visit and submission of additional information, the validation team has raised some forward action requests in order to highlight issues related to project implementation that require review during the first verification of the project activity, see also section 4.1., 4.2., 4.6. and table 3 of the validation protocol.

**FAR 6(TR):** It has to be clarified in the course of the periodic verification and comparison with the actual sales numbers if the planned sales and market penetration for the different stove categories is realistic within the crediting period of 7 years with remaining 5 years under consideration of the retroactive crediting request and the current market presence in and around Kampala only, taking into account the low market penetration with improved efficient cooking stoves in rural areas, which are mainly wood stove users.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 21(GS):** *In section D.2 of the PDD, please replace the sentence ‘The methodology is specifically designed to match the project conditions’ by ‘The monitoring methodology has been developed in the context of this project activity’.*

**Conclusions:** The sentence was amended as requested.

#### 4.5.1 Parameters determined ex-ante

All reported factors required by the monitoring methodology for Improved Cook-stoves and Kitchen Regimes V.01 “Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes”, the parameters required for monitoring given in the PDD as well as the necessary management system issues were assessed during the on-site assessment.

This included the raw data like equipment ratio per household, cluster definitions, wood to charcoal conversion, stove lifespan, NCV, EFCO<sub>2</sub>, fractional Non-Renewability (NRB), meals per day in institutions and other parameters from previous Kitchen Surveys and Kitchen Tests and the resulting GHG emission reductions by stove type based on previous kitchen surveys and kitchen tests are assumed ex-ante:

##### Emission reductions per stove-year for sample and adjusted for all sales

Cluster	Stove type	Emission reductions	Fuel savings		Emission reductions
		Average from sample	Lower bound of 90% C.I.		Lower bound of 90% C.I.
		tCO <sub>2</sub> e/st-yr			tCO <sub>2</sub> e/st-yr
a	Charcoal Sizes 2-5	2.02	0.25	t/yr	1.46
b	Charcoal Size 1	1.82	0.22	t/yr	1.32
0	Institutional	47.98	0.072	kg/adjusted meal	35.62
d	Wood domestic	4.08	1.252	t/yr	2.56

#### 4.5.2 Parameters monitored ex-post

*This section shall include an evaluation of the data and parameters that need to be monitored.*

The main raw data are coming from the accounting books of Ugastoves Limited, namely:

- Production records of stove manufacturer Ugastoves Ltd., other manufacturers, ceramicists under supervision of Ugastoves Ltd.
- Sales records of Ugastoves Ltd., other manufacturers to distributors, retailers and direct sales.
- Receipt and warranty card records of end-users

These data have to be cross-checked continuously and annually during verification with other data on plausibility. The Ugastove sales record is collected by the Financial Manager based on sales receipts submitted by the sales team.

The accountant enters this information into a Quickbooks accounting system. On a monthly basis, the Operations Manager aggregates the information, checks it for accuracy and sends it to CEIHD.

Under supervision of CIRCODU periodic (4 per year) spot checks at Ugastove to ensure that production, sales, and inventory records match purchases of raw materials. These records will also be cross-checked with artisan labour records (ensuring the number of stoves produced matches the amount of labour for which artisans were paid).

A Monitoring Kitchen Survey is undertaken of 25 Ugastove customers each three months, and that the data collected is held in a Detailed Customer Database. This data will function as a guide to sustainable development indicators, and as a guide to evolving baseline conditions and to factors such as usage drop-off and age performance of Ugastoves.

The Monitoring Plan includes bi-annual Kitchen Surveys (KS) and Kitchen Tests (KTs), which will include investigation of the performance of ageing Ugastoves, so that such adjustments can be made to the emission reduction values used in monitoring reports. Also, usage will be investigated, and appropriate adjustments made to emissions reductions claims based on measured usage drop-off rates.

The following data to be reported in the monitoring report from the project has been assessed in detail:

Main project parameters:

Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored
<i>Stove Sales</i>	<i>Sales Records</i>	<i>Number of stoves by type and size</i>	<i>M</i>	<i>Daily</i>	<i>All sales</i>
<i>Project Fuel Consumption</i>	<i>KTs</i>	<i>Mass fuel per year</i>	<i>M</i>	<i>Biannually</i>	<i>Sample</i>
<i>Clustering definitions</i>	<i>Monitoring KS</i>	<i>As specified above</i>	<i>E</i>	<i>Quarterly</i>	<i>Sample</i>
<i>Usage factor</i>	<i>Usage KT or KS</i>	<i>% operational</i>	<i>M, E</i>	<i>Biannually</i>	<i>Sample</i>
<i>Age Factor</i>	<i>Stove-age KT</i>	<i>Mass fuel per year</i>	<i>M</i>	<i>Biannually</i>	<i>Sample</i>
<i>New Stove performance</i>	<i>New Stove KT</i>	<i>Mass fuel per year</i>	<i>M</i>	<i>Biannually</i>	<i>Sample</i>
<i>Market development</i>	<i>Company records and Quarterly Report</i>	<i>Sales trends and expenditure on sensitisation and promotion</i>	<i>E</i>	<i>Quarterly</i>	<i>Major promotional activities</i>

Sustainable development indicators:

Sustainable Development Indicator	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)
<i>Air quality</i>	<i>Survey</i>	<i>Air pollutants (CO, particulates)</i>	<i>Survey observations</i>	<i>Estimated through home interviews and observations as to inside/outside cooking</i>
<i>Lively-hood of the poor</i>	<i>Survey</i>	<i>Financial impact</i>	<i>Ug Sh</i>	<i>Estimated through home interviews during quarterly Kitchen Survey visits to randomly selected Ugastove buyers</i>
<i>Employment</i>	<i>Survey</i>	<i>Numbers</i>	<i>Employees</i>	<i>Direct employees and retailers of Ugastoves are measured and spin-off employment (competitors) is estimated</i>
<i>Access to Energy Services</i>	<i>Survey</i>	<i>Fuel cost, consumption, ease of collection</i>	<i>Tonnes/year, prices, walking distances</i>	<i>Estimated through kitchen tests and surveys</i>
<i>Human and institutional capacity</i>	<i>Survey</i>	<i>Skill levels</i>		<i>Estimated through records of Ugastove and spin-off achievements in business, marketing, and technology areas</i>
<i>Technological self-reliance</i>	<i>Survey</i>	<i>Achievement</i>		<i>Estimated through observation and record of Ugastove and spin-off technical innovations and developments</i>

These parameters and indicators, which are further described in the PDD, section D.2. and Annex 3., are in line with the baseline and monitoring methodology, the monitoring plan and are considered as sufficient for the periodic verification.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 23(GS):** *Please provide equations in the sections D.2.1.3 and D.2.1.4 or refer to the correct other sections.*

**Conclusions:** The amendments have been done in the different sections of the PDD, which leads to a better traceability for interesting third parties.

### 4.5.3 Management system and quality assurance

The project's monitoring plan includes:

- A description of the responsibilities and authorities for project management as outlined in organograms for the manufacturing team, the sales and marketing team and the team members of Ugastoves Limited, CEIHD and CIRCODU assigned to the monitoring team,
- Procedures for monitoring and reporting including sustainable development indicators, and QA/QC procedures through a third party (CIRCODU),
- Procedures for day-to-day recording and storage.

During on-site assessment it was confirmed by the project owner, that these procedures will be maintained and implemented according to the project's monitoring plan and the monitoring methodology for Improved Cook-stoves and Kitchen Regimes V.01 "Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes", in order to enable subsequent verification of emission reductions.

The project is implemented and has been in operation since October 2008 under the project concept as Gold Standard Voluntary Carbon Offset project, since the applied methodology was not available and had to be developed for the project activity and was approved by GS-TAC in 2008 only. The project developer has applied in parallel for retroactive crediting under the Gold Standard, since the project activity was already implemented through a major marketing and promotion effort, combined with technical development and quality assurance to disseminate reliable improved-efficiency models at affordable price, based on upfront payment from expected VER revenue from September 2005 through 2006 and 2007 because of a serious slump in sales of the predecessor company UCODEA in August 2005, which in the process of project implementation became Ugastove Ltd. after introduction of a overworked business plan with an improved marketing and operational capacity, a new quality assurance system with warranty cards and the technical designs of the stoves in order to achieve a high efficiency stove performance standard.

The project local project participant Ugastoves Limited could establish with support of JP Morgan Ventures Energy Corporation and CEIHD a project management system to the fire wood and charcoal saving project. Relevant monitoring and measurement procedures have been documented and relevant employees have been trained to ensure stipulated procedures are adhered to. Uganda Stove Manufacturers ( Ugastove ) Limited has been incorporated with Limited Liability in the Republic of Uganda under No. 92275.

The quality assurance of data management of Ugastoves Limited will be further improved through employment of a third party expert with independent status and suitable credentials from CEIHD, CIRCODU ( the Centre of Integrated Research and Community Development Uganda ) to ensure quality control in several of the monitoring activities. This third party expert will be responsible for the correct implementation of the monitoring plan consisting among others of periodic Kitchen Surveys, Usage Surveys, leakage investigation, and spot-checks (including field observations of retailer activity) to confirm the validity of Sales Records and to confirm the absence of double-counting in any form. During the on-site assessment Mr. David L. Mukisu and Mr. Muhammed Kawere of Ugastoves Ltd. showed to the validation team besides of the main technical manufacturing premises also the different documentation used:

- QuickBooks Sales Analysis for the Sales Period: 1 September 2005 – 30 June 2006
- QuickBooks Sales Report 1 July – 30 June 2007
- Energy Saving Stove Order Form
- Release Order Form
- Receipt Form
- Delivery Note Form
- Different Invoice Forms
- Promotional Sales Leaflet
- Warranty Card

Hence it could be concluded that Ugastoves Ltd. fulfils the main technical and commercial requirements for manufacturing of the improved efficient charcoal and wood domestic stoves as well as institutional wood stoves.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 10(TR):**

A. Define overall project management responsibility for project implementation and implementation of the monitoring plan including periodic kitchen tests and kitchen survey as well as periodic monitoring reports, supported by an organogram and flow chart.

B. The kitchen survey should be extended to domestic wood stoves and institutional wood stoves in representative sample groups.

**Conclusions:** The PDD has been revised accordingly as follow:

A. Implementation and monitoring responsibilities are held by CEIHD, Ugastove management, and the 3<sup>rd</sup> party consulting group CIRCODU as described (with an organogram/flow charts) in Annex 3 of the amended PDD and in Annex 1 of this document.

B. Annex 5.1 of the PDD (Kitchen Surveys) has been amended to include domestic wood and institutional wood stoves kitchen survey reports. The file name has been amended to include “V2” and later on “V3” and the relevant date ( 22 August 2008 or 30 September respectively ) for clarity. CAR 10(TR) is closed.

**CAR 11(TR):** Add uncertainties for all other parameters that shall be monitored according to the selected methodology.

**Conclusions:** Section D.3 has been amended accordingly. CAR 11(TR) is closed.

**CL 04(TR):** Clarify and show evidence that a training program addressed to the new technology with responsibilities has been established. An organogram of the manufacturer and distribution channels, which shows the additional jobs of skilled workers necessary to manufacture and distribute the efficient cookstoves for households and institutions, has to be shown to the audit team. Also the assignation of tasks related to operation and maintenance / guarantee services has to be disclosed to the verifier. A summary of both issues shall be inserted in the PDD.

**Conclusions:** Advances on carbon finance fund skill development and training for workers in manufacturing and sales. In manufacturing workers are focusing on specific tasks. A subset of labourers are focusing stove liner production and kiln operation, others focus on metalwork. Ugastove has invested in developing and training two Production Managers and a Master Craftsman who serves as a quality controller.

Ugastove is developing a sales and marketing department completely funded by advances on carbon finance. 100% of the budget for this department will come from carbon finance advances starting September 1, 2008. An expert Marketing Director has been hired, and that person is building a skilled sales team that will be funded by carbon finance advances.

Through 2007 and 2008 considerable carbon finance has been used also to finance business training for Ugastoves lead by CEIHD, including introduction of the Quick Books accounts system and analysis of business needs, allow leading for example to the decision to invest in the cost of an expert Marketing Director.

The manufacturing team is responsible for stove maintenance and warranty fulfilment. Specifically, requests come into the Security Officer who works the cash- box. That person identifies the correct employee in manufacturing to complete the warranty request.

The issues are addressed in the PDD in Annexes 3 and 4.4. CL 04(TR) is closed.

**CL 10(TR):** Clarify and show evidence which procedures for quality assurance for the documentation management is in place.

**Conclusions:** Ugastove and CEIHD have jointly developed documentation management and reporting guidelines to ensure quality assurance. This is described both in Annex 4.4 of the amended PDD and also in annex 2 to this document (“Implementation of Rigorous Reporting Structure”). As can be seen, there is an ongoing protocol for documentation management both at Ugastove and with CEIHD. CL 10(TR) is closed.

**CL 11(TR):** Clarify and show evidence which procedures are available for day-to-day handling of records.

**Conclusions:** This is addressed in Appendix 4.4 of the amended PDD and in Annex 2 to this document. CL 11(TR) is closed.

**CL 12(TR):** Show evidence for procedures for training of monitoring personnel.

It has to be clarified, in which steps the training is planned and how the responsibilities and tasks of the operator, distributor, CO<sub>2</sub> consultant and technology supplier are allocated. Procedures for price control of the energy efficient stoves should be implemented in order to ensure the integrity of the carbon finance mechanism. Training of the involved staff and retailers as well end-users is expected to be provided before start of the crediting period and during the regular crediting period, starting after registration of the project activity. Tasks and responsibilities should summarized within the PDD.

**Conclusions:** With respect to monitoring personnel, an expert 3<sup>rd</sup> party is to be deployed (the Center for Integrated Research and Community Development Uganda). CIRCODU will undertake key monitoring tasks and in turn will provide training alongside CEIHD experts, to the Ugastove staff in record keeping relevant to monitoring. This is addressed in Annex 3 of the PDD.

With respect to end-users, customers who buy directly from Ugastove at Town Service events receive training directly at point of sale. A stove brochure and “users manual” is under development that will state a clear retail price of each size of stove, as well as providing guidance to customers purchasing indirectly.

Cage retailers receive training from Ugastove on how to operate and sell efficient stoves. Supermarket buyers are trained in the use and sale of stoves, and expected to pass the knowledge on to their salespeople and customers.

Tasks and responsibilities are summarized within the PDD in Annex 2.

CL 12(TR) is closed.

**CL 13(TR):** Show evidence for procedures for emergency preparedness.

**Conclusions:** Ugastove has contracted with KK Security to provide a uniformed security guard who is on-site during business hours and has been trained in emergency procedures. We will contact them and ask for documentation of that contract, and for additional information about emergency procedures. CL 13(TR) is closed.

**CL 14(TR):** Show evidence for procedures review of reported results/data.

**Conclusions:** The guidelines in “Implementation of Rigorous Reporting Structure” (Annex 2 of this document) accounts for the day-to-day handling of records at Ugastove and CEIHD at documentation management. Quality Assurance will also be provided by the Center for Integrated Research and Community Development Uganda (CIRCODU), a 3<sup>rd</sup> party monitoring and evaluation organization. CIRCODU will provide monthly spot checks at Ugastove to ensure that production, sales, and inventory records match purchases of raw materials. These records will also be cross-checked with artisan labor records (ensuring the number of stoves produced matches the amount of labor for which artisans were paid). CL 14(TR) is closed.

**CL 15(TR):** Show evidence for procedures for corrective actions in order to ensure a more accurate future monitoring and reporting.

**Conclusions:** Response is as to CL 14 above, which covers also this clarification request. CL 15(TR) is closed.

**CL 7(GS):** *Please describe further the mechanisms to be put in place by the independent third party expert in charge of the quality control to prevent any risk of doublecounting due to other similar project activities that could potentially claim the same emission reductions, e.g. what are the control procedures in place to make sure that a retailer cannot claim carbon credits twice for the same cook-stove sold?*

**Conclusions:** No other stove manufacturers or distributors are currently developing carbon finance within the project boundary, thus eliminating the risk of double counting. If other projects are developed within the boundary, CIRCODU, the 3<sup>rd</sup> party monitoring partner, will crosscheck sales records from retailers with offsets claimed by Ugastove and other project developers claiming ERs within the project boundary.

See also Annex 3 and Appendix 4.3 of the amended PDD which contains this text.

## 4.6 Estimate of GHG Emissions

*Referring to part B and Annex 2 of the PDD.*

The monitoring of the project is comprehensive and in accordance with the approved monitoring methodology. The monitoring methodologies and sustaining records were sufficient to enable verification of emission reductions. Majority of the factors used are either adopted from IPCC or project specific data.

According to the applied Methodology for Improved Cook-stoves and Kitchen Regimes the project proponent is obliged to provide an equivalent level of justification for quantities of green-house gas emitted from production as from use. There are significant CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CO, and TNMHC emissions arising from typical charcoal production processes.

The publication “Emissions of greenhouse gases and other airborne pollutants from charcoal making in Kenya and Brazil, David M. Pennise, Kirk R. Smith, Environmental Health Sciences, University of California, Berkeley, California. Journal of Geophysical Research Vol 106 October 27 2001” /52/ has been used as reference. Table 6a of above publication summarises the calculations of the averages of measured emissions of greenhouse gases from earth mound kilns. Although these measurements were taken in Kenya studies reveal that the same techniques for charcoal production are used currently in Uganda. For example the Ministry of Energy and Mineral Development – Republic of Uganda, published a report titled: “Charcoal Production and Licensing in the districts of Apac, Kamuli, Kayunga, Kiboga, Kiruhura, Luwero, Msindi, Mityana, Mpigi, Mubende, Mukono, Nakaseke, Nakasongola and Wakiso”, authored by Richard Kisakye /53/, which describes extensive and detailed survey as well as referencing available literature and parallel studies.

The report states: “All charcoal in Uganda is produced by use of traditional kilns especially the earth mound of earth clamp kiln”. A background research by the validation team confirms the production of charcoal in Uganda by earth kilns.

Therefore the validation team accepts the current approach as it is based on the above results, which are for the time being considered as credible data.

**FAR 7 (TR):** The project proponents are encouraged to submit procedures to more accurately assess ex-post prior to the annual verification the values for greenhouse gases emitted from production of charcoal based on more recent research results or methodology development in this field and the impact of future technologies used for charcoal production in Uganda.

All the parameters needed for emission reduction calculation of the applied improved cook stoves calculations were sufficiently monitored.

The formula used for the emission reduction calculations was found to be accurate. However, some of the assumptions made in version 1 of the PDD were in need of further justification. The relevant assumptions made in the calculations have been further substantiated with evidence from the project proponent to confirm that the assumptions made in the calculations are fair and conservative. The quantity of Ugastoves sold in each monitoring period will be used in the emission reduction calculations.

**FAR 2(TR):** It has to be clarified the following forward action request as the Ugastoves purchased by distributors are not necessarily being sold to end users. If stoves are not sold to end users, the carbon saving in the calculation may not be real. The project proponent has to review this FAR during project implementation by means of interviews with the distributors and interviews of end-users during kitchen survey or kitchen test in preparation of the periodic verification using a statistically robust ex-post analysis, in order to evaluate the time between stoves being sold by the producer and utilized by end users ( in terms of average days ). As a conclusion this calculated number of days can be applied to all stoves sold as a safety margin, which means that with a defined assurance or confidence level any given stove will have to be sold within a defined number of days of arrival at any given retailer, including an additional estimated travel time to the outlets within the project boundary. The calculation of carbon emission reduction in terms of wood and charcoal saving will hence only have to be counted certain days after the sales of the stoves.

The kitchen tests and kitchen surveys will be carried out periodically according to the monitoring plan of the methodology in the field.

The underlying assumption in these tests is from our understanding that the consumers use only two types of stoves (traditional stove and Ugastove) and either use charcoal or fire wood only. The observation during the site visit and background investigations revealed that users might have more than these two types of stoves and that mixing of fuel is practiced. The short and fast cooking would normally use firewood or other fuels ( e.g. kerosene, LPG ) which could generate more intense fire. The slow and time consuming cooking such as boiling soup, water and rice would normally utilise charcoal.

The dry and wet seasons and any fuel mix have to be taken into account in the field test and survey but also in the laboratory test under predetermined test conditions, concluding that during dry season there is a higher efficiency for both firewood and charcoal users and that a fuel mix of wood and charcoal and other biomass residues will lead to lower efficiencies than using the design fuel.

**FAR3(TR):** Besides of the exemplary field tests in the kitchen survey or kitchen test respectively, which take into account also the cooking habits and behaviour of the relevant sampled households it is considered to be essential to achieve reliable data and establish continuing QA/QC procedures to undertake in addition periodic third party laboratory tests [“water boiling test” and “performance test” utilising both the traditional stoves and improved stoves (“Ugastoves” ) to evaluate and verify the efficiency gained in the “Ugastoves” in laboratory (controlled) settings ] . This tests should also take into account the mix of fuels and the properties of the fuels in more detail.

The assumption of 10 years working life of the institutional wood stoves and a 3 years lifespan of the domestic “Ugastoves” stated in the PDD is deemed to be conservative, if the end-user are operating the efficient stoves properly. Anyhow during on-site assessment it was reported, that often the clay in the stove breaks because of customer’s misuse ( e.g. applying of water for cooling / shutting off the stove after cooking; trying to pushing pieces of charcoal through the combustion air holes of the clay.

**FAR 4(TR):** The project proponent has to review regularly during the verification period throughout field survey that the stated assumption of the average lifespan of 10 years for the

institutional wood stoves and 3 years for the domestic “Ugastoves” is reliable. Adjustments shall be made should there be any deviations.

The calculation has utilised default values of IPCC 2006 and 1996, i.e. net calorific value NCV and CO<sub>2</sub>-emission factor EFCO<sub>2</sub> for charcoal and wood.

**FAR 5(TR):** It has to be ensured during the verification period to use updated values of NCV and EFCO<sub>2</sub> for wood and charcoal from local independent laboratories or if justified the latest available default values from IPCC 2006 or further updated, the relevant emission reduction calculations and spreadsheets have to be revised accordingly.

The quantity of stoves produced by each producer has to be monitored to check on the overall movement of “Ugastoves” in the market.

All necessary documentation will be collected, referenced and aggregated and will have to be easily accessible in hard-copy or electronic format. Key data can also be cross-checked via other sources, such as stoves produced, sales and inventory data.

The emission reduction E<sub>Ry</sub> by the project activity during the crediting period is the difference between baseline emissions (B<sub>Ey</sub>), project emissions (P<sub>Ey</sub>) and emissions due to leakage (L<sub>y</sub>), as follows:

Project emissions: there are no emissions from the project which is a renewable energy project.

Leakage: no leakage has to be considered for the proposed project activity, if no leakage effects will be detected during the periodic kitchen surveys and kitchen tests.

Emission reduction:  $E_{Ry} = B_{Ey} - P_{Ey} - L_y = B_{Ey}$ .

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 13(TR):**

Calculation of ER is different from calculation in the Excel Sheet attached. Please update this table.

**Conclusions:** Emission Reduction has been recalculated and revised in the PDD.

The relevant excel sheet is attached with this submission of V3 PDD. The excel sheet attached to PDD version 1 was updated in July and August during the response period in order to provide the required calculations for section E and to amend the NRB fraction according to the upgraded NRB study. CAR 13(TR) is closed.

**CL 18(TR):**

On page 4 of PDD: “An improved stove working for six months qualifies as 0,5 operational stove-years.”

Please clarify the relationship between “Number of users by year end” and “Projected operational stove years” in Excel Sheet”.

**Conclusions:** The relevant excel sheet is attached allowing the formulas to be seen. The Number of Users by Year End is calculated as the number of stoves sold this year plus the number of users at end of last year minus the number of stoves expiring this year (in this projection, stoves are assumed to operate for 3 years then expire). The Operational Stove Years are half the sales this year (since installations are assumed to occur evenly through the year) plus the number of users at the end of last year (since these stoves will carry on being used this year) minus half the number of expiries this year (since the schedule of expiries mirrors the schedule of installation 3 years previously, that is, the stoves are assumed to expire evenly through the year). CL 18(TR) is closed.

**CAR 2(GS):** *The approach followed for the calculation of the non-renewable biomass fraction (NRB) must be transparent and therefore the Annex 5.5 cannot be considered as confidential and must be integrated to the PDD in order for stakeholders to be able to comment on it as part of the mains stakeholder consultation.*

**Conclusions:** The assessment of NRB is now in Annex 2 and is not confidential.

**CAR 4(GS):** *Please sense-check the identified NRB fraction with figures given in studies published for other neighbouring African countries if available.*

**Conclusions:** Annex 2 includes the requested sense-check of the neighbouring African countries Rwanda, Kenya, Tanzania and Niger.

**CL 12(GS):** *Emission reductions - Please provide Table A.2.4 of Annex 2 under the section E.1 of the PDD and provide a table with the carbon intensities considered for the various fuels (with references). Also provide the equations used for the calculation of the emission reductions under E.1, E.2, E.3, E.4 and E.5.*

**Conclusions:** PDD has been amended accordingly, leading to more traceability.

**CL 13(GS):** *Leakages- provide more evidence regarding the observations made which allow to dismiss leakages a, b, d and e (p-15).*

**Conclusions:** The PDD has been amended to contain the further evidence that the quantitative results of the Kitchen Test subsumes the potential sources of leakage a, b, d, and e, above. Because the KT represents fuel savings in actual households, the results already incorporate the effects of these potential leakages. Leakage source c, fuel-switching, is addressed through the Kitchen Survey which (like the follow-up KTs) is a continuous monitoring requirement and a leakage factor will therefore be applied in the future if significant fuel switching from wood to charcoal is observed. Leakage source f, transport, is a consideration not addressed by the monitoring KTs or KS's, but contributes to surplus emission reductions (from reduced charcoal shipments to Kampala) as much, if not more, than it contributes to leakage.

Indeed all the potential sources of leakage discussed above will be followed throughout the project period. Fuel-switching will be continuously monitored in the KS follow-up studies for both rural and urban sales, and the leakage factor re-evaluated accordingly.

**CL 14(GS):** *Please make sure that all references used for the calculation of the NRB are publicly available or provide them in order for the DOE to be able to reproduce the NRB calculation.*

**Conclusions:** The PDD has been amended accordingly, leading to more comprehensibility.

**CL 23(GS):** *Please provide equations in the sections D.2.1.3 and D.2.1.4 or refer to the correct other sections.*

**Conclusions:** The PDD has been revised containing all the mentioned equations.

## 4.7 Environmental Impacts

*Referring to Part F of the PDD.*

No Environmental Impact Assessment (EIA) has been performed, because there is no legal obligation according to the Ministry of Environment and Forestry of Uganda. An official document of the District Environmental Officer of Kampala City Council, stating the Exemption for Environmental Impact Analysis has been submitted to the validation team.

The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The local authorities could confirm this issue during stakeholder consultations, the outcomes of the First Round Consultation did also not result in any negative comments on significant impacts of the proposed project on the environment.

As the Sustainable Indicator Matrix of the project does also not contain any negative scores, from the view of Gold Standard requirements no voluntary EIA was necessary to conduct likewise.

It was confirmed during on-site assessment, that the project proponent is committed to collaborate closely with the stakeholders, in the implementation of the full scale of the project activity with all its components, in order to minimise impacts to the environment, ensure safety and minimise disturbance to activities present at the project site.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 16(TR):** Clarify the date of issue of a document with “Positive conclusion of the project’s impacts to the environment issued by NEMA.

**Conclusions:** The “Positive conclusion of the project’s impacts to the environment issued by NEMA” was received by Ugastove in August 2007 and was made available to the validation team. CL 16(TR) is closed.

#### **4.8 Comments by Local Stakeholders**

*Referring to Part E and Annex 4.1 of the PDD.*

There is no mandatory requirement to conduct a local stakeholder consultation for such kind of demand-side energy efficiency projects in place in Uganda.

A voluntary initial stakeholder consultation process or first round consultation has been performed during the design phase through inviting local residents to comment on the project activity. The initial stakeholder ( ISC ) meeting was facilitated by Pioneer Carbon – the predecessor of ClimateCare (JP Morgan Ventures Energy Corporation), Urban Community Development Agencies, and Venture Strategies for Health and Development on 16 March 2007 in Kampala, visited by thirty participants.

The second round stakeholder consultation took place on 14 January 2008 in Kampala with 27 participants.

A report and a summary of the stakeholder meetings was submitted to the validation team. There were no adverse comments on the project activity and all comments are supportive of the project which has created new job opportunities in the region at Ugastoves Ltd. and in the supply chain of the improved efficient stoves.

A summary of comments is provided and has been verified by TÜV Rheinland. Follow-up interviews of the local stakeholders were performed during the on-site assessment. During the visit the discussion was focussed on the status of the project implementation and the appreciated additional commitments of the project proponent to the commercial and household end-users and the different parties of the supply chain of the “Ugastoves”.

The planned measures could be verified. The overall positive impact of these measures could be confirmed also during the meeting with the different local stakeholders like stove distributors and retailers Sholar Foods & Take Away, A-Y Hardware Makindye - Ms. Joy Zzimule, Mini Price Supermarket Entebbe Road, Kyelima General Hardware - Mr. Njagala, Mohammed and the Gayaza Cambridge College of St. Mbaaga - Mr. Lwanga, Stephen and Mr. Zziwa, Vincent as well Mrs. Kellen Namusisi of the School of Public Health.

The report of the stakeholder meetings has been reviewed by TÜV Rheinland and deemed adequate and transparent without concluding further corrective action or clarification requests.

#### **4.9 Comments by Parties, Stakeholders and NGOs**

A short project description in German and English language and the PDD were made available under the web page of:

[http://www.tuv.com/de/clean\\_development\\_mechanism\\_cdm\\_.html](http://www.tuv.com/de/clean_development_mechanism_cdm_.html)  
[http://www.tuv.com/de/en/clean\\_development\\_mechanism\\_cdm.html](http://www.tuv.com/de/en/clean_development_mechanism_cdm.html)

for a voluntary second round global stakeholder consultation process.

Parties, stakeholders and NGOs were through these web sites invited to provide comments.

**Comment by:**

☐ Accredited NGO

☐ Party

☐ Stakeholder

**Inserted on:**

**Subject:**

**Comment:** No comments were received during the above global stakeholder consultation process.

***How has considered the comment received in its validation:***

N/A

## 4.10 Gold Standard Requirements

The Gold Standard requests besides of the successful assessment against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the fulfilment of the requirements for Voluntary Offset Projects under the Gold Standard.

Projects which pass the screens listed in Box 1 are eligible for the Gold Standard.

**Box 1: Overview of The Assessment Framework and Its Three Screens****Project Type Eligibility Screen** (see Ch.3.2)

- ☐ Project type check
- ☐ Host country eligibility check

**Additionality Screen** (see Ch.3.3)

- ☐ Previous public announcement check
- ☐ Additionality tool
- ☐ Conservative approach check
- ☐ Technology transfer and/or technology innovation

**Sustainable Development Screen** (see Ch.3.4)

- ☐ Sustainable development assessment
- ☐ Environmental Impact Assessment (EIA)
- ☐ Public consultation procedures

Moreover the project activity is focussing on the UN Millennium Project recommendation related to energy for cooking with regard to the requested support for:

- (a) efforts to develop and adopt the use of improved cookstoves,*
- (b) measures to reduce the adverse health impacts from cooking with biomass,*
- and (c) measures to increase sustainable biomass production*

(UN Millennium Project *et al.*, 2005).

In the following sections these additional requirements are assessed and evaluated.

**a) Eligibility of the project for Gold Standard****Project Type Check:**

According to the Gold Standard all projects technologies included in the figure below are eligible.

**Box 5: Eligible Project Types****Renewable Energy** (see section A.1 below)

- PV
- Solar thermal
  - Electricity
  - Heat
- Ecologically sound biomass, biogas and liquid biofuels
  - Heat, electricity, cogeneration
  - Transport
- Wind
- Geothermal
- Small low-impact hydro, with a size limit of 15 MW, complying with WCD guidelines

**End Use Energy Efficiency Improvement** (see section A.2 below)

- Industrial energy efficiency
- Domestic energy efficiency
- Energy efficiency in the transport sector
- Energy efficiency in the public sector
- Energy efficiency in the agricultural sector
- Energy efficiency in the commercial sector

The assessed project uses a domestic and a commercial energy efficiency technology, namely improved efficient charcoal and wood cooking stoves as well as improved efficient institutional wood stoves.

The project contributes significantly to the mitigation of climate change and the region's sustainable development, applying a new methodology for large-scale project activities, which was designed for the Gold Standard Foundation, which is the GS-Methodology for Improved Cook-stoves and Kitchen Regimes V.01 "Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes". Hence the project is eligible under Gold Standard.

**Host Country Check**

The host country does not have a quantitative reduction target under the Kyoto Protocol. Uganda has ratified the Climate Change Convention on 8 September 1993 and is therefore listed in Annex-I to the UNFCCC, and also has ratified the Kyoto Protocol on 25 March 2002 and is hence listed in Annex-B to the Kyoto Protocol (no quantified emissions limitation or

mitigation commitment yet) too. Conclusion: The Republic of Uganda is eligible as host country for Gold Standard Voluntary Offset Projects.

## Project Size Check

**Table 4 (revised): Definitions of Micro-, Small- and Large Scale Projects with the GS for Voluntary Offsets**

Micro-scale	Small-scale	Large-scale
<5k tCO <sub>2</sub> e per year	>5k and <60k tCO <sub>2</sub> e per year	>60k tCO <sub>2</sub> e per year

‘Large-scale’ and ‘small-scale’ project activities are now defined in accordance with UNFCCC rules, as explained below:

The project activity is assumed to achieve annual emission reductions of 85,615 t CO<sub>2</sub> e, which is belonging to the category of large-scale projects under GS for Voluntary Offsets, according to the Gold Standard, version 01(revised) with more than 60,000 tCO<sub>2</sub>e per year, based on the adaptation of GS VER SSC thresholds to CDM thresholds according to “Gold Standard Rules and Procedures Updates and Clarifications”, dated December 17th 2007 /18/, .

## Eligibility for Retroactive Registration

The Gold Standard feedback was made available to TÜV Rheinland. The relevant CARs and CLs were also further elaborated under CAR(GS) and CL(GS) within this validation.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 1(GS):** Please revise the expected start date of the crediting period in order to not claim for retroactive crediting more than up to a maximum of two years worth of emission reductions prior to the date of registration under GS.

**Interim Conclusions:** The PDD sections C.1.1 and C.2.1 have been amended to show the expected start date of the crediting period to be 1<sup>st</sup> October 2006. Registration is expected to take place before 1<sup>st</sup> October 2008. (A note has been included in C.1.1 that installations from Sept 2005 are eligible for crediting from the credit start date).

The amended PDD is dated 22-8-08 and is labeled V2.

**Final Conclusions:** The final PDD /51/ states as Starting Date of the First Crediting Period “Two years before Date of Registration (or 1<sup>st</sup> of April 2007 if so chosen by project participants and later than Date of Registration)”, which is deemed to be conservative and in line with the GS rules for Retroactive Registration.

**CL 02(TR):** In the PDD it is written. “The carbon finance provides a basis for maintaining a professional commercial relationship between the user and disseminators, while also introducing an affordable price, a quality guarantee and a warranty system”. The decision for an early project implementation was according to the follow-up interviews in May 2008

(on-site assessment ) largely made taking into account potential possibility to cover a part of the costs and to lower potential risks by selling VERs generated by the project, which has not happened yet.

Please provide clear evidence for this statement: What kind of document was the basis to print on the warranty cards the text “\*Carbon Credits are registered and used\*”? When issued? By whom?

**Conclusions:** JPMorgan Energy Ventures (trading as ClimateCare) has provided to date considerable finance (see details in response to CAR07 above) in the form of advance payments for anticipated verified emission reductions in order that the project could be launched and maintained, and in order that finance was available to expand the Ugastove capability, increase volume of sales and preserve affordable prices.

The statement on warranty cards as to carbon credits being used was necessary to establish that payments had been made already which subsidized the stove price and so any customer had effectively accepted the that carbon credit was already used by virtue of accepting the price; also to establish ownership of rights to credits in order that expenditure on baseline studies, preparation of carbon documents, validation, verification, and registration, was not at risk. The word registered is used in the sense that application was being made for registration and the project is registered on the Gold Standard registry, thus excluding other application for registration, and successful final registration is anticipated. It was believed at time of printing that no documents existed at the time which prescribed a formal approach to title and that this message was an appropriate method. CL 02(TR) is closed.

**CL 03(TR): C.1 Starting date of the project**

Clarify by relevant documents the date of

- Real action
  - Construction
  - Implementation
- of the project activity.

The project participants shall further demonstrate the additionality of the early VER project activity taking into account also further evidence of VER consideration. If the starting date of the project activity is before the date of validation ( which is the case because of the submission of the request for retroactive registration as GS-VER project ), provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. This evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available at, or prior to, the start of the project activity.

**Conclusions:** UCODEA began operations in 1997. It was registered as a legal entity in Uganda in 2000. However, Mr. Kawere Muhammad’s stovemaking experience dates back to the early eighties. In 2004 UCODEA began working with CEIHD. In 2005, both organizations identified the possibility of leveraging carbon finance to sell stoves and reduce carbon emissions. The organization became the Uganda Stove Manufacturing Limited, or Ugastove, in 2007.

Documentary evidence has been provided to the GS and TUVR of recognition of dependency on carbon finance in the second half 2005.

As starting date has been confirmed the 1<sup>st</sup> January of 2006, which is deemed to be conservative.

Anyhow, as the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity, the application for retroactive crediting for the project activity is considered to be appropriate, but has to be further specified to a selected date ( 1<sup>st</sup> of October 2008, 1<sup>st</sup> of October 2006 or a date in 2005 containing the sales of 3,000 domestic charcoal stoves and 15 institutional wood stoves ). In this context it has to be taken into account the previous funding of the awareness building and capacity building project, which has been obviously expired in December 2006, see CAR 07(TR).

Would you mind please kindly further substantiating the claimed starting date of the project activity with further evidence ( e.g. signature of MoU, agreement, ERPA, Board decision, etc. ).

### **Conclusions:**

The time frame has been revised to 1<sup>st</sup> of October 2006 instead of 1<sup>st</sup> of April 2006, which is 2 years before 1<sup>st</sup> of October 2008, based on the pre-feasibility assessment of GS regarding the request of the project proponent for retroactive crediting. The final crediting period will depend on the final approval of the registration request for the project activity.

The final PDD states as Starting Date of the First Crediting Period “1<sup>st</sup> of April 2007 or two years before Date of Registration, whichever is earlier”.

According to the communication with GS-TAC on 15/01/2009 it was confirmed, that the improved stoves installed since the project starting date ( 01/01/2006 ) and the relevant emission reductions are eligible for the generation of emission reductions within the first renewable crediting period of 7 years.

The final PDD states as Starting Date of the First Crediting Period “Two years before Date of Registration(or 1<sup>st</sup> of April 2007 if so chosen by project participants and later than Date of Registration)”.

CL 03(TR) - see also CAR 04(TR) - is closed.

### **Final Summary for the Eligibility of the Project Activity for Retroactive Registration**

According to Gold Standard requirements the following steps are necessary for a retroactive registration as GS-VER project:

1. Pre-assessment of the Gold Standard – relevant documentation by the GS-TAC; payment of an administration fee
2. Retroactive validation of the fulfilment of the GS-VER requirements by a DOE
3. Registration by the Gold Standard Secretariat
4. Retroactive Gold Standard verification of the credits
5. Payment of a credit fee

It could be demonstrated with relevant evidences, that above mentioned steps 1 and 2 could be finalized with the following summarized explanations:

- Stakeholders were appropriately consulted with regard to sustainable development implications, their feedback and the consideration of these feedbacks for the final project design.  
During on-site assessment and follow-up interviews it could be confirmed, that this process is ongoing through the continued close contact with all stakeholders as part of the marketing efforts and the periodic monitoring including kitchen surveys and kitchen tests.
- Several Gold Standard supporting NGOs have been invited to the stakeholder meetings. Mr. David Duli of WWF used the opportunity during the first round stakeholder consultation ( initial stakeholder meeting on 16 March 2007 ) for valuable comments, which have been further considered for the implementation of the project activity and in parallel for the completion of the new Gold Standard Methodology “Voluntary Market Methodology for Improved Cook Stoves and Kitchen Regimes” of 10 July 2007.
- The indicators of the sustainable development matrix have been scored along the Gold Standard guidelines. It was supported with further evidences, which could be confirmed during the on-site assessment and follow-up interviews. Some minor corrections have been made during the validation process.
- Regarding environmental impacts, the project design has been checked and endorsed by the relevant authorities in Uganda. This positive feedback was also confirmed during the two rounds of stakeholder consultations ( stakeholder meetings in March 2007 and January 2008 ) by representatives of the Designated National Authority and the National Environmental Management Authority (NEMA) of Uganda and the follow-up interviews of the validation team in May 2008. Moreover a “Positive conclusion of the project’s impacts to the environment” has been issued by National Environment Management Authority (NEMA) on 13.08.2007
- Critical indicators determining the beneficial role of the project activity in terms of sustainable development have been included in the monitoring plan from the beginning.

Finally it can be concluded that the project “Efficient Cooking with Ugastoves” has followed all necessary steps and requirements for a retroactive registration resulting in the following recommendation of the validation team:

*After all corrective action and clarification requests could have been resolved the verifier TÜV Rheinland recommends to submit the request for registration for the project “Efficient Cooking with Ugastoves” as a Gold Standard VER project activity directly to Gold Standard Foundation (GS-TAC).*

*The starting date of the first crediting period “1<sup>st</sup> of April 2007 or two years before date of registration, whichever is earlier”. According to the communication with GS-TAC on 15/01/2009 it was confirmed, that the improved stoves installed since the project starting date ( 01/01/2006 ) and the relevant emission reductions are eligible for the generation of emission reductions within the first renewable crediting period of 7 years. The starting date of the project activity could be justified with evidences as 1<sup>st</sup> of January 2006.*

*The final PDD states as Starting Date of the First Crediting Period “Two years before Date of Registration(or 1<sup>st</sup> of April 2007 if so chosen by project participants and later than Date of Registration)”.*

## **b) Technological transfer**

Environmentally safe and sound technologies are central to achieving sustainable development objectives. In terms of mitigation, cleaner technologies and energy efficiency can provide win-win solutions, allowing growth and the fight against climate change to proceed hand in hand ( Source: Yvo de Boer, Executive Secretary UNFCCC, Beijing, PR China, 24 April 2008 ). Energy efficiency presents a huge under-exploited GHG reduction opportunity. Technology transfer is the process of developing practical applications for the results of scientific research, consisting of sharing of skills, knowledge, technologies, methods of manufacturing, samples of manufacturing and facilities among industries, universities, governments and other institutions to ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, applications, materials or services.

The project activity results in technology and knowledge transfer related to:

- Manufacturing of three types of stoves by Ugastoves Limited:
  - improved fuel-efficient charcoal stoves for domestic and restaurant use
  - improved fuel-efficient residential wood stoves
  - improved fuel-efficient institutional wood stoves
- Adequately control quality, market, brand, protection of the brand, with appropriate product identification
- Distribute the stoves through a new system of distribution channels
- Introduction of a warranty system for the stoves in order to differentiate from traditional stove types combined with a third party QA/QC system containing periodic kitchen tests and kitchen surveys
- Introduction of promotional activities for further market penetration
- Building up skilled labour and informed end-users and distributors through country-wide training activities starting in and around Kampala

## **c) Sustainable development screen**

The project has used the sustainable development indicators matrix as required by the Gold Standard. The total score obtained is a +8 where:

- Local/regional/global environment has a subtotal of +2
- Social sustainability and development has a subtotal of +4
- Economic and technological development has a subtotal of +2

For none of the indicators a negative score has been given. All the assumptions used to define the score values have been revised by the validator, based on submitted documentation and the on-site visit made during the validation of the project.

Hence this criteria have been correctly demonstrated by the project proponents in a very conservative way without any overestimation of any of the indicators.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 5(GS):** *Please note that employment in the section ‘Social sustainability & development’ is about employment quality, when employment in the section ‘Economic & technical development’ is about employment numbers (jobs created). Both can be credited with a positive impact in this project activity.*

**Conclusions:** The PDD has been amended accordingly.

**CL 17(GS):** *The scoring of the SD indicators must be easily reproducible by the DOE. Please refer to publicly available information sources (with page numbers, if applicable) or to expert opinions (provide expert contact details) in the argumentation provided to support the scoring of each one of the SD indicators, e.g. in the Stakeholder Consultation report, it is mentioned that the results of a study conducted in the context of the project activity showing that improved wood stoves reduce carbon monoxide by 54% and particulate matter by 49% compared to the traditional three stone wood stoves.*

**Conclusions:** The PDD has been amended accordingly.

**CL 18(GS):** *Please also provide an argumentation for the indicators considered neutral.*

**Conclusions:** The PDD has been amended accordingly.

**CL 19(GS):** *Please remove the indicator ‘soil condition’ from the section on Economic and Technological Development.*

**Conclusions:** The PDD has been amended accordingly.

#### **a) Use of the additionality tool**

There has not been any public announcement of the described project activity going ahead without VERs. VER revenue is the only external source of funding, the project activity could not go ahead as proposed without upfront payment from the future VERs.

The project follows in a correct form every step of the approved additionality tool.

- The guidance of Gold Standard Foundation for retro-active crediting is applicable as the project is a retroactive project
- Step 1 defines correctly all the alternative scenarios and the consistence with the laws and regulations.
- Step 2 ( investment analysis method ) was not applied, because the project activity with these features and scale is considered as “First-Of-Its-Kind” in Uganda.
- The barriers and related documentation presented in Step 3 have been checked and found plausible and appropriate for this specific project activity. They have been accepted by the validator.
- Step 4 shows that there is no similar project of this scale in Uganda.

Hence the project has demonstrated the additionality correctly using the tool approved by the CDM Executive Board of UNFCCC with special focus on the early consideration of VER and the demonstration and justification of barriers and following the guidance from Gold Standard Foundation regarding retro-active crediting.

Further information on the detailed assessment and evaluation on the identified barriers and prevailing practice is provided under chapter 4.4.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 1(GS):** *The use of the latest version, at the time of submission, of the Additionality Tool is mandatory under GS rules. Please revise the section on additionality assessment according to the Additionality Tool version 41.*

**Conclusions:** The PDD has been updated accordingly and the latest version of the “Tool for demonstration and assessment of additionality” (Version 05) has been used to assess and demonstrate additionality of the project. References to version 05 of the tool is made under section A.4.4 and B.1 of the PDD.

**CL 2(GS):** *Please support with data and available references the assertion according to which scenarios of a widespread use of LPG or electricity are unlikely to happen during the considered crediting period.*

**Conclusions:** This has now been explained in the PDD (section A.4.4) and an independent credible report, “*HEDON House Hold Energy Network report*” has been referenced, Further discussion, with appropriate references, has been made under “Common Practice Analysis”, section A.4.4 of the PDD.

The increase in the global price of LPG and other substitute products makes it inconceivable that fuel switching will occur on a large scale, certainly not within the required monitoring period for an evolving baseline. As evidenced by the price expectations revealed by futures contracts, internationally tradable energy commodities are expected to maintain levels much higher than those over the previous 12 years. During the previous 12 years, with much lower LPG prices, almost no fuel switching has been observed. Electricity supply remains unreliable in Kampala and the capital to invest in electric cooking technology is unavailable and uneconomical for all but the richest people in Uganda. Niels Tomijima, a stove expert from UC Berkeley who completed a site visit to Ugastove can confirm this. He can be reached at Tomijima@berkeley.edu.

**CL 3(GS):** *A price of more than 8 USD per charcoal stove is said to be unaffordable for most of the population targeted and this is presented as a major barrier to investment (PDD, p.9). Please support this assertion with data and available references (e.g. annual income distribution among the population and show how carbon revenues provide the necessary additional revenues to the stove providers to make this efficient cook-stove business a viable one, e.g. compare true cost and selling price of the stove, and define the share of carbon revenues in the business model.*

**Conclusions:** The company has been selling at lower prices than cost and has been unable to pay employees (Appendix 4.2 of the amended PDD). A reference has been made to “Distribution of Welfare in Uganda” which shows the annual household expenditure in Uganda (See PDD section A.4.4).

Evidence from interviews with end users, independent artisans and retailers, and Ugastove’s staff indicate that at current prices Ugastoves are unaffordable to the majority of Ugandans<sup>1</sup>. With the addition of carbon finance, efficient biomass stoves will be cheap enough for lower income households in Uganda to afford them. That is, some carbon revenues will act as a direct subsidy so that efficient stoves are cost competitive with their business-as-usual counterparts. At current prices, purchasing an Ugastove would account for a significant percent of average annual incomes and the ability for users to save this amount of money to purchase the stove is extremely difficult. Carbon finance will lower the price of stoves so that a larger spectrum of Ugandan society can afford them.

Currently charcoal Ugastoves are being sold below cost in an attempt to compete with traditional market alternatives that range in price from \$1 to \$8 (anecdotal evidence from end users and collected during the Kitchen Surveys and site visits to retailers and markets). Based on the price range of competing stoves, field observations in the summer of 2008 by a UC Berkeley PhD student in Economics and CEIHD and Ugastove, it is estimated that charcoal Ugastoves will sell in much higher volumes if the price to end users can be brought down below \$8 per stove.

In the absence of carbon finance Ugastove has kept prices down to \$9 - \$10 by not paying staff salaries and accruing debt to vendors and the National Social Security Fund. The barrier of this unsustainable business approach is now being overcome by using carbon finance to pay salaries and marketing expenses to effectively subsidize the cost of stoves to an affordable price point, even though this is likely below the cost of production.

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<sup>1</sup>“Distribution of Welfare in Uganda” as referenced in PDD and <https://www.cia.gov/library/publications/the-world-factbook/geos/ug.html#Econ>

**CL 4(GS):** *Please provide some evidence supporting the assertion according to which standard financial institutions, notably those providing microcredits, consider such a business model as too risky (e.g. studies mentioned on p.9 concluding that the business model tested in 2005 was not sustainable, letter from such a financial institution, etc.).*

**Conclusions:** Because the commercial banks needed security which Ugastoves was not able to raise, they did not apply for any loans and therefore there is no documentation from the banks. On the other hand, in Uganda, micro-finance institutions typically do not lend out more than US\$ 2,000. Ugastoves needed more than US\$ 20,000, which could only be provided by commercial banks but with adequate security.

Ugastove's current efforts to increase stove distribution have been hindered by a lack of working capital for manufacturing, distribution and marketing. Because the company is currently selling below cost and therefore incurring operating losses, no bank would be willing to loan to the company as future repayment would be impossible. Basically, without carbon finance, stove distribution at the current stove price is unprofitable. Access to any sort of loan product doesn't change the fact that the project activity is unsustainable, and that no loan to Ugastove could be repayed without carbon financing.

Individuals micro-finance loans to people who seek to buy Ugastoves are also commercially infeasible. No microfinance institution is willing to make loans of \$8 USD. In fact, a company seeking to access microcredit for a solar product has been unable to secure micro financing for a product that costs \$20 USD, and has also been unable to secure small loans of about \$100 that would serve as working capital for their sales people. The company is Barefoot Power, and their Uganda Director, Harry Andrews, can confirm this. [www.barefootpower.com](http://www.barefootpower.com).

In addition, Micro-credit organizations tend to have a strong bias towards productive vs consumptive loans. That is, they prefer to lend for purchases that will lead directly to income generating activities. Although stoves that improve public health and promote sustainable development have linkages to ones income, micro-credit organizations tend not to recognize these linkages. David Mukisa and Kawere Mohammed of Ugastove can be contacted directly to attest to the difficulties Ugastove has encountered in trying to secure direct loans.

**CL 5(GS):** *Cook-stove programmes funded by donor agencies are mentioned on p.11 and said to have had little impact on the overall cook-stove market. Please provide publicly available references (or contact details) where further information can be found about these programmes.*

**Conclusions:** This has been updated under "Common Practice Analysis" with several references. The websites referenced also provide contact information (See PDD section A.4.4)

#### e) ODA Additionality screen

The chapter A.4.4 clearly shows that ODA funding has not been included to realise any step of the process and even the bank's funds do not include any ODA funding. Hence the project complies with the requirements. The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Uganda. The financial structure of the proposed project activity ( financed by equity and commercial bank loan ) has been reviewed accordingly.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 07(TR):** Provide evidence, that no ODA funding is used for the described project activity.

**Conclusions:** Declaration of Non-Use of ODA has been provided by “United State Environmental Protection Agency”.

There has been no public funding in the form of Overseas Development Aid (ODA) nor diversion of ODA nor prospect of such for the duration of the project. The project and Ugastove Ltd are not Ugandan government projects or government project beneficiaries and are not eligible for ODA.

Evidence for the absence of ODA is in the form of the following statement of project funding to date (all further relevant ownership and financial information are available for validation and verification):.

- 16% - US\$ 65,000 - Debt accrued based on the expectation of future carbon payments. Debt has accrued to Ugastove employees, to CEIHD, and to Ugastove's suppliers of goods and services.
- 3% - US\$ 10,000 (approximate) - Shareholder equity in the form of assets such as vehicles and land, the use of which is given without charge to Ugastove by Ugastove shareholders.
- 81% - US\$ 320,000 - Advances on carbon finance provided by JPMorgan Climate Care

Future prospect is for carbon funding to be the sole mode of external assistance beyond sales revenue.

Prior to establishment of Ugastove Ltd, the Partnership for Clean Indoor Air (PCIA) provided CEIHD and the Urban Community Development Association (UCODEA), the organization that was the predecessor to Ugastove, with a \$200,000 grant to develop an improved clay liner, to build a kiln, and to provide other manufacturing related improvements. This grant focused on product improvement but did not provide the necessary financing to scale production or marketing and thus did not suffice to make the project viable. The purpose of the grant, and the mission of the PCIA was only on the reduction of airborne particulate matter. The grant expired on 12/31/2006. CAR 7(TR) is closed.

**CL 6(GS):** *Please provide a transparent description of the project financial plan showing that no ODA funding is being used to purchase VERs.*

**Conclusions:** The project financing is addressed as follows:

There has been no public funding in the form of Overseas Development Aid (ODA) nor diversion of ODA nor prospect of such for the duration of the project. The project and Ugastove Ltd are not Ugandan government projects or government project beneficiaries and are not eligible for ODA.

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#### **f) Use of conservativeness**

There are many factors and uncertainties that can affect the predicted project's greenhouse gas emission reductions compared to the baseline.

Potential factors that may result in a lower VER estimate include:

- Over-estimation of the total number of stoves in continuing use
- Under-estimation of the total number of sold improved efficient stoves of the brand "Ugastoves"
- Under-estimation of the water content of the measured fuel
- Over-estimation of the fraction of fuel that is non-renewable wood is over-estimated
- Over-estimation of the efficiency of sold improved efficient stoves of the brand "Ugastoves"
- Unexpected leakage effects as described under section B.2. a) – f) of the PDD

Possible factors that may result in a higher VER estimate include:

1. No accounting is made for non-CO<sub>2</sub> greenhouse gases
2. Under-estimation of improved stove efficiency
3. No accounting of positive leakage: i.e. households adopting improved stoves outside the project implementation.
4. The average fraction of fuel coming from non-renewable wood may be underestimated

Additional factors that may have a significant, but unknown impact on VER estimates:

1. Systematic reporting bias by households for stated fuel use and food production
2. Errors in the estimated net calorific value of charcoal, wood, kindling and other biomass residues
3. Statistical cross correlations and skew in the variations in collected interview data
4. Selection of equal-household weighting for computation of village consumption averages
5. Dependence of stove efficiency on the number of meals cooked
6. Quality variations in improved stove design

On balance, given the various factors and their potential impact on the VER estimate, it is more likely that the VER estimate in this report is conservative, because the PDD has been prepared in a professional way. The VER estimates are made in a conservative and transparent manner, in order to avoid any artificial inflating of the number of VERs resulted for the project activity.

All the assumptions and parameters used for in the PDD comply with the conservativeness criteria.

This applies for the following criteria:

- Application of a evolving baseline over the crediting period which will cover any possible variation of parameters as described above
- For charcoal stoves of “Ugastove”, sizes 2 to 5: Adjustment downwards the fuel saving figure derived from the Kitchen Test (KT) by a factor of 0.83. This factor takes into account the conditions observed by the Kitchen Survey (KS ): Secondary fuel use, retained use of old stove alongside new.
- For charcoal stoves of “Ugastove”, size 1: Adjustment downwards the fuel saving figure derived from the KT by a factor of 0.75. This factor takes into account the conditions observed by the KS (secondary fuel use, retained use of old stove alongside new), and in addition accommodates the relative fuel consumption of small stoves compared to no 2 size stoves, within a conservative margin.
- For institutional “Ugastove” wood stoves: A statistical analysis of the results found at 90% confidence level that the average saving of the institutional stoves were 0.072 kg of wood per adjusted person-meal, where the adjustment in this case normalises primary children’s meals and light meals. This value is conservative given a significant percentage of institutional stoves are used by the military and restaurants, which invariably cook larger portions per person-meal compared to primary schools with young children.

- For domestic “Ugastove” wood stoves: A provisional KT in 2007 in Kampala indicated an emission saving of 2.56 tCO<sub>2</sub>e/stove-year. This is considered an indicative but conservative figure due to limitations in the sampling size and the necessity to carry out the KT in specific rural areas as and when the marketing operations of Ugastove develop in those areas. The predicted sales for domestic wood stoves and the resulting emission reductions seems to be under-estimated under consideration of the large un-exploited potential in Uganda.
- The first Kitchen Tests were performed during the summers of 2006 and 2007 between June and August. The single measurement campaign is justified and conservative because it was performed in lower fuel use seasons (not near Christmas or Easter) and avoided weekends, which is when families typically cook more. The KT results are also conservative in that results from households with unusually high fuel savings were excluded from analysis as outliers. The source of these outliers were non-typical, high volume, cooking events such as funerals or graduation celebrations.

#### **g) Monitoring of sustainable development parameters**

The PDD shows all the parameters to be monitored. The monitoring process of every parameter is clearly explained in the PDD. Hence the monitoring plan is plausible and verifiable if implemented as stated in the PDD. As there is no critical parameter according to the Sustainable Development Assessment Matrix no further monitoring regarding sustainability is necessary.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CAR 08(TR):** The critical parameter Indoor Air Quality (IAQ: CO, PM, etc) as well as the number of employment and trained staffs and retailers as well as the planned qualification and market penetration activities have to be monitored and to be inserted into the monitoring plan (Section D). No information about accuracies and uncertainties are given.

**Conclusions:** Sections D.2.1.2 and D.3 have been amended accordingly. CAR 08(TR) is closed.

**CAR 6(GS):** *Please make sure that the sensitisation, marketing, and demonstration activities said to be funded by carbon revenues in order to alleviate the prevailing practice barrier (PDD, p.10) are included in the monitoring plan.*

**Conclusions:** In the amended PDD table D.2.1.1 now has an item 7 which stipulates that promotional activities are to be monitored.

**CL 16(GS):** *In the Stakeholder Consultation report, p. 10, it is stated that besides the use of available data, plans are underway to carry out independent Non-Renewability determination that would be used to refine future data and carbon calculations. Please provide an update on this independent NRB determination activity.*

**Conclusions:** This is consistent with the PDD monitoring plan which requires periodic re-assessment of NRB fraction. The study will be done by independent and credible experts in the course of 2009. Currently it is planned to deploy the Berkeley Air Monitoring Group (BA), based in California, to undertake the leadership of this study, and to deploy the Centre for Integrated Research and Community Development Uganda (CIRCODU) as a local expert company to continue the monitoring on a regular basis.

**CL 22(GS):** *Please identify the SD indicators to be monitored over the crediting period with an asterisk (\*) in the SD Matrix.*

**Conclusions:** The PDD has been revised accordingly.

The justifications with regards to the SD matrix had been elaborated in more detail with references where available. The PDD has been revised accordingly. The SD indicators that will be monitored had been indicated with an \* and had been added to the monitoring plan.

## **h) Environmental Impacts**

An environmental impact analysis is not required by the regional environmental authority in Uganda. According to the GS an EIA should be performed if any sustainable development indicator is scored with -1. Hence this project does not need an EIA to comply with the GS requirements. All the possible impacts caused by the project activities have been clearly explained in the PDD and during the on-site assessment and follow-up. Hence the project is considered to comply with the environmental impact criterion.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 20(GS):** *From the list of persons present at the second Stakeholder Consultation, it seems that no GS supporter NGOs have attended. Please provide proof that they have been invited to the meeting or alternatively to comment via letter or email. Otherwise, please make sure to invite these organisations for comments as part of the Main Stakeholder Consultation during the validation.*

**Conclusions:** Emails were sent to the GS supporter NGOs inviting them to the main stakeholder consultation meeting (which has already taken place as reported in the PDD). Attached to the emails were the project summary, invitation letter, sustainable develop criteria questionnaire with a request to fill in and return. None of them responded to the invitations. Copies of the invitations (e-mails with attachments) can be retrieved and forwarded to the DOE as evidence.

## **i) Stakeholder consultation requirements**

The project proponent has carried out two stakeholder consultations as required by the Gold Standards. All relevant stakeholders have been invited to the first round stakeholder consultation on 16 March 2007 and to the second round stakeholder consultation 14 January 2008. As required by the GS a list of the consulted stakeholders has been submitted to the validator.

The initial stakeholder process included a questionnaire to determine the environmental impacts caused by the project. Approximately 30 representatives from government, environmental and civil society organizations, academia and the private sector met to review the proposed project.

Moreover, the GS-supporting NGO WWF in person of Mr. Duli has been invited and has attended. He has noted among others, that the cooking needs of the population within the Albertine Rift Valley, a major focus of WWF's efforts, puts pressure on the forest. Fuel-efficient technologies are needed to reduce the effect of energy demand on protected areas. He also noted the effect of climate change on Uganda's high altitude ecosystems and lakes. His comments were verbal, no written statement has been received.

The presentation held by Tom Morton of Pioneer Carbon has contained a non-technical summary of the project, the explanation of the sustainable development impacts and a checklist on environmental and social impacts. Questions raised during the meeting were answered by Tom Morton as well Mr. Mukisa and Mr. Kawere of Ugastoves Ltd. and Mrs. Dana Charron of Venture Strategies for Health and Development.

For the second round stakeholder consultation a summary of the first round consultation and a questionnaire have been submitted to all the relevant stakeholders along with the PDD, and a non-technical summary.

The Designated National Authority of Uganda, represented by Mr. Philip M. Gwage of the Department of Meteorology was also invited and informed about the project activity. After having presented the institutional framework for greenhouse gas reduction in Uganda and the history of the Clean Development Mechanism, the official procedure for obtaining a letter of approval from the DNA, he has finally pointed out the importance of carbon reductions to poverty alleviation and other Millennium Development Goals. He has been expressed his support for the planned project activity as case study for a voluntary offset project under the Gold Standard.

No further written comments were received.

Hence the requirements for local stakeholder process for Gold Standard projects have been fulfilled.

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

## **j) Others**

*Relevant Corrective Action Requests ( CARs ) and Clarification Requests ( CLs ) could be successfully resolved and are summarized below and under section 4.10. for transparency reasons:*

**CL 09(TR):** Clarify and show evidence which procedures for registration, monitoring and reporting is in place.

**Conclusions:** The project is registered on the Gold Standard registry with status that pre-assessment and validation is current. CL 09(TR) is closed.

**CL 17(TR):** Clarify why no GS-supporting organisation has given any written comment to the project activity, e.g. Mr. David Duli of WWF, who has attended the initial stakeholder meeting.

**Conclusions:** GS-supporting organisations were invited and provided with a project summary attached to the invitation letter together with a sustainable development questionnaire to fill in case they couldn't attend. None of them gave a written response. Mr. David Duli of WWF has been given his comments during the meeting, but has not responded in a written form. CL 17(TR) is closed.

**CL 24(GS):** *Transfer of emission reduction ownership – Stakeholders have expressed the need for clarification about the carbon rights of individual purchasers of the stoves and the response provided was that customers of a Ugastove routinely receive a warranty card on which is printed the message that the carbon finance associated with use of the stove has been used (p.24, point 5).*

*Please provide a more detailed description of the mechanisms put in place for the transfer of the emission reduction ownership (from the cook-stove users to ClimateCare via potential intermediaries), including how this effectively prevents risks of doublecounting.*

**Conclusions:** Ugastove currently secures the rights to all emissions reductions from end users through warranty cards which, by virtue of stating that carbon credits are already used, express that any end user claim to emission reductions (ERs) is waived in preference to Ugastove in return for partial payment for the stove (since the stove price is subsidized by carbon finance). This rather cryptic warranty card statement is being improved currently by the following measure: leaflets in local language are being placed inside the combustion chamber of each stove sold, with an explanation of carbon finance and an explanation of the waiving of ER rights via subsidized pricing.

Emission reduction (ER) rights secured from the end user are held by CEIHD through an Emissions Reduction Purchase Agreement with Ugastove that defines carbon revenue sharing. CEIHD sells a portion of these rights to Climate Care through a further purchase agreement.

The PDD has been amended in section G.3 to record this improvement in communication to stakeholders.