

Final Report

Version 3, 6.10.2016

FUEL EFFICIENT STOVES IN EAST AFRICA: REDUCING EMISSIONS AND
IMPROVING LIVELIHOODS

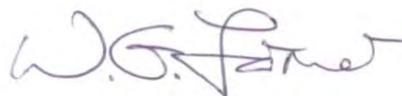
KENYA, RWANDA, TANZANIA AND UGANDA

Grantee: CARE Danmark

Local Partner: Uganda Carbon Bureau Ltd

Project start date: *01/01/2011*

Project end date: *24/09/2016*



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TABLE OF CONTENTS

1.	EXECUTIVE SUMMARY	3
2.	ASSESSMENT OF IMPLEMENTATION OF THE PROJECT	4
2.1	Implementation of Activities.....	4
2.2	Deviations from the Planned Activities.....	6
2.3	Achievement of Outputs and Objectives	6
3.	CLIMATE CHANGE	7
4.	DEVELOPMENT IMPACTS AND CROSS-CUTTING ISSUES	8
5.	ASSESSMENT OF THE RESULTS AND IMPACTS OF THE PROJECT	8
5.1	Relevance	8
5.2	Effectiveness	9
5.3	Efficiency	9
5.4	Impact	9
5.5	Innovativeness and learning	10
6.	SUSTAINABILITY AND SCALING UP	11
7.	FINANCIAL REPORTING	11
8.	CONCLUSIONS AND RECOMMENDATIONS	13

ANNEXES

Annex 1	Final Audit Report
Annex 2	Financial Report
Annex 3	Other supplementary documentation regarding the addition of 4 more CPAs

1. EXECUTIVE SUMMARY

The objective of the project was, and remains, improving the livelihoods of poor households in Africa by facilitating access to carbon finance for suppliers of fuel-efficient cook stoves, and to thereby help transform the stove market from inefficient traditional cooking methods to improved cook stoves (ICS). The project aimed at reducing household air pollution and resources (time and cash) spent on wood fuels for cooking, while at the same time reducing Greenhouse Gas (GHG) emissions, and hence mitigating climate change.

The means of achieving this objective was planned to be a collaboration with CARE Denmark to create a multi-country CDM/Gold Standard (GS) Programme of Activities (PoA) covering a number of East African countries in which CARE had offices. CARE Denmark had approached the Uganda Carbon Bureau (UCB) in 2010, having heard that UCB was in the early stage of establishing such a PoA. In the event, the Improved Cook Stoves for East Africa (ICSEA) PoA was successfully established as the world's first multi-country PoA, covering Kenya, Uganda, Rwanda and Burundi. It was planned to also include Tanzania, but no Letter of Approval (LoA) was ever issued by the Tanzanian Government.

Many CDM and GS registration complexities were experienced, but all were eventually overcome. The original project timetable proved to be far too short, and the planned 24-month project was largely completed by the time of the final external audit to 31 May 2015, but this was exceptionally extended to 69 months to meet the final milestone. This has now been achieved. CARE Denmark exited the project after 30 months.

The PoA is now in the process of being scaled up with the addition of more individual members (Component Project Activities – CPAs), countries and an additional methodology (AMS-I.E) that will cater for stoves using fuel made from renewable biomass (another global first for the ICSEA PoA).

To ensure that the resulting carbon credits have the highest market appeal the PoA will continue to operate with CDM and Gold Standard accreditation, and is now adding the new Fairtrade Climate Standard (for which two of its CPA members are 'road-test projects').

ICSEA Ltd has managed to master the extraordinary complex CDM procedures, and benefits from a close working relationship with the Kampala-based CDM Regional Collaboration Centre. This ensures a rapid and personal response to all queries and requests for support, and effective access into the CDM's headquarters. It has similar close ties with the Gold Standard and Fairtrade. The carbon market is in a

state of flux, so the PoA will continue to hedge its risks in the best interest of the CPA members by maintaining a triple accreditation mix.

2. ASSESSMENT OF IMPLEMENTATION OF THE PROJECT

2.1 Implementation of Activities

Activity 1: Project Manager and Support Facility Coordinator (SFC) recruited; Non-Renewable Biomass (NRB) baselines initiated; Validation initiated

The sub-activities were all achieved largely on time. No additional NRB baselines were required, as default figures and existing materials were used. After 12 months the Project Manager left and the SFC took over the position.

Activity 2: PoA validated along with pilot CPA in Uganda; Support Facility designed; POs recruited

The completion of the draft documents for the PoA was achieved, and the validation by the UN auditor Tuv Rheinland started. The first Project Officer (PO) for the Support Facility (for Uganda, at UCB) was then recruited in June 2012 once it was clear that the PoA would be registered. No additional POs (who were supposed to have been placed at CARE country offices) were recruited because of the absence of ICS activities in the CARE Kenya and Rwanda offices, and the lack of an LoA for the PoA to cover Tanzania.

Activity 3: Official launch of Support Facility

This was launched ahead of time because of the timely recruitment of the SFC.

Activity 4: NRB baselines completed

This was achieved for Uganda on time, by using existing data and support from the National Forestry Authority, instead of undertaking a new baseline development.

Activity 5: PoA registered; first verification planning started; next 4 CPAs identified

The PoA's validation report was completed and submitted to the CDM, and its registration was achieved on 17 August 2012, and subsequently with the Gold Standard on 25 February 2014. In both cases the process was far more complicated and time consuming than had been anticipated. The first monitoring and verification exercise of stoves distributed by the first CPA (of the International Lifeline Fund) was planned in 2013. The next 4 CPAs were identified during 2014, their draft inclusion documents were prepared in 2014/2015 and were then updated in 2015/2016 for the addition of the second methodology (AMS-I.E – covering a fuel switch from non-renewable to renewable biomass). The revision of the PoA Design Document was

supported by KfW and Belgian Technical Cooperation, and was finally approved by the CDM on 27 June 2016. The 4 CPAs were finally included on 24 September 2016.

Activity 6: First CDM verification started and completed; CERs (carbon credits) added to ICSEA account

The first monitoring exercise was carried out during 2013/14. The verification was completed by the UN auditor (Carbon Check) on 17 July 2014, and the first issuance of CERs was made to the ICSEA account on 28 October 2014. Both exercises took very much longer to achieve than planned because of the extraordinarily complex nature of the CDM and Gold Standard procedures, and the earlier delay in the Gold Standard registration process that held up the start of the Carbon Check field verification exercise. ICSEA organised the sale of the CERs to a German bank at a price of EUR10 per CER.

Activity 7: Final project capacity building phase; Support Facility handover; additional 4 CPAs added to the PoA

The final project capacity building phase took place during late 2014 with work on template development and the scaling up of new CPA project inclusions. The Support Facility was handed over to new core staff. Six additional CPAs (5 in Uganda and 1 in Kenya) were processed to be included into the PoA under a contract (copy attached) with the UN auditor (Carbon Check) in a first inclusion batch, and all 6 were assisted with their Local Stakeholder Consultations by ICSEA staff, and their documents were added into the Gold Standard registry (see annexed screenshots), to be processed for simultaneous registration with the CDM.

Their formal inclusion dates then became dependent on the CDM approving the Post Registration Change (PRC) to the ICSEA PoA involving the addition of a second methodology (AMS-I.E). This now allows ICS-users who are switching to sustainable biomass fuels (e.g. sustainable woodlots, briquettes and pellets) to earn carbon credits, and at a higher rate than just using an improved stove. This has been another ICSEA world-first step. In anticipation of the CDM approval of the methodology combination, the inclusion documents for all the 6 new CPAs were prepared using revised templates. Carbon Check was contracted to process the PRC.

Additional Activities: The successful creation of an Ignition Fund, to provide de-risked funding for the Inclusion Fee and associated expenses for CPAs, took place with support from Nexus Carbon For Development, a Singapore-based cooperative, of which UCB was one of its first African members. Creating such a fund was mentioned in the original project description. GIZ has since provided a top-up to this fund.

The development of a PoA-wide database was initiated in 2013, and is currently being finalised using Salesforce software, with partial support from a grant from the Global Alliance for Clean Cookstoves (GACC).

2.2 Deviations from the Planned Activities

2.4.1 Activities that have not taken place

All the main planned activities took place, except that the expected active partnership with the respective CARE country offices never materialised, and the LoA for Tanzania was never provided by the government, despite repeated contacts and requests. CARE has never made further contact with us. Efforts are still on-going with Tanzanian parliamentarians and the CDM RCC to obtain a Tanzanian LoA.

2.4.2 Unforeseen (but positive) activities that have taken place

The addition of South Africa and Lesotho into the PoA was made with support from the Philips company in anticipation of them distributing an improved stove being manufactured in Lesotho. However, to date no CPAs using their stove have been brought forward and their relationship with the Lesotho company appears to have ended. However, there is still an expectation that stove projects in South Africa will come forward for inclusion in future.

The ICSEA PoA was selected by the Fairtrade Foundation to be a ‘road test’ partner for its Fairtrade Climate Standard. After over 3 years of working with Fairtrade, the first CPAs of the Fairtrade-accredited Coffee-A-Cup and Gumutindo cooperatives in eastern Uganda are in the first batch of organisations to use this new standard. Fairtrade accredited CERs have to be sold above a set minimum price, and Fairtrade will be actively supporting their marketing. The aim is to maximise the number of ICSEA PoA members to achieve the triple CDM/GS/Fairtrade accreditation to achieve premium CER prices.

A second methodology (AMS-I.E) was added to the PoA as a Post Registration Change as a result of UCB’s submission to the CDM Executive Board for this expansion in the scope of the PoA to be approved. This was achieved in June 2016, and provides a major incentive for improved cook stove projects to include a fuel-switch component away from charcoal to the use of briquettes made from biomass waste. The leading manufacturer of briquetting equipment, C.F.Nielsen from Denmark, is working closely with UCB and ICSEA Ltd to introduce a new small Village Briquetting line to be pioneered in Uganda.

2.3 Achievement of Outputs and Objectives

Planned Objectives and Outputs	Indicator(s):	Achievement of the objectives and outputs:
Activity 1: Project Manager and Support Facility Coordinator (SFC) recruited; NRB baselines initiated; Validation initiated	Staff recruitment. NRB information for PoA registration acquired. Validation commissioned.	Staff recruited as required. NRB material necessary for registration acquired. Validation initiated and completed.
Activity 2: PoA validated along	Validation by UN-auditor.	Validation achieved.

with pilot CPA in Uganda; Support Facility (SF) designed; POs recruited	SF designed. PO recruitment.	SF designed and implemented. PO for Uganda recruited. Others not recruited because of lack of CARE projects and no Tanzania LoA.
Activity 3: Official launch of Support Facility	SF launched.	Achieved.
Activity 4: NRB baselines completed	Sufficient NRB data for PoA and first CPA acquired.	Achieved.
Activity 5: PoA registered; first verification planning started; next 4 CPAs identified	PoA registration. First verification planned. Next 4 CPAs identified,	All achieved.
Activity 6: First CDM verification started and completed; CERs (carbon credits) added to ICSEA account	Verification started & completed. CERs issued.	Both achieved.
Activity 7: Final project capacity building phase; Support Facility handover; additional 4 CPAs added to the PoA	Final project phase achieved. SF handover done. 4 CPAs being added.	Final phase achieved. SF handover achieved. 4 CPAs added to the PoA.

3. CLIMATE CHANGE

The project's core focus has been the creation of a first multi-country CDM/Gold Standard Programme of Activities (PoA) to make carbon finance accessible to many organisations supplying improved cook stoves in East Africa. Despite the multiple obstacles that were encountered, this goal was achieved. The PoA is now scaling up its work in conjunction with international supporters such as GACC and Nexus Carbon For Development. Project developers and governments in other countries (South Sudan, Swaziland, Malawi, etc.) have expressed interest in using the PoA.

Other batches of candidates for inclusion into the PoA are currently being assembled for each month into 2017. Three are scheduled for October, and five are planned for November. However, there is an urgent need for additional finance for the Ignition Fund to be able to support these organisations with 'de-risked' loans for their Inclusion Fees. This has been piloted over the past year, and is capable of becoming an important tool in multiplying the impact of the project. A crowd-funding platform (with support from UNDP) is currently being planned, along with an application to the Green Climate Fund.

The project has created a PoA structure that can be used to significantly scale-up access to carbon finance as a catalyst for an unlimited number of organisations to add ICS programmes. Each new CPA is capable of generating approximately 43,600 CERs per year (for charcoal stoves) and 43,700 CERs for wood stoves), but with the

addition of the AMS-I.E fuel switch methodology, an additional 58,200 CERs for previous charcoal users and 36,800 CERs for previous wood users can now be earned. So far approximately 34,000 t CO₂e have been reduced.

A first issuance of 4,052 CERs was achieved for the PoA's Monitoring Period 15 September 2012 to 14 March 2013 in respect of the International Lifeline Fund's CPA 01. ICSEA Ltd was eventually asked by ILF to find a buyer, and Commerzbank made a direct purchase of the issued CERs at EUR10 per CER.

4. DEVELOPMENT IMPACTS AND CROSS-CUTTING ISSUES

All the development impacts described in the original Project Description are now being achieved, and are capable of being amplified as more CPAs are added to the PoA. A demonstration ripple effect is being encouraged by the support that the World Bank, GIZ, CDM, GACC and others are giving to UCB to publicise the ICSEA PoA.

Virtually all the ICS in Africa are used by women, and the cleaning up of indoor air pollution has a major beneficial impact on their lives and those of young children. By lowering the amount of wood and charcoal fuel used by each household, there are immediate and visible environmental effects, which are being reinforced by the addition of the second methodology that will encourage the uptake of renewable biomass fuel. So far 22,000 households have benefitted from the cookstoves.

The project was influential in creating a new paradigm of recognition that the Certified Emission Reductions (CERs) in ICS projects are created and owned by the women using the stoves, and not the manufacturers of the stoves. This influenced GACC, the Gold Standard and Fairtrade to take a more robust position regarding the Free, Prior & Informed Consent needed in the monetisation of the CERs, and the way this income is shared with stove users to incentivise the more widespread adoption of these climate change mitigation appliances.

The early formulation of the project's 'fair trade ethos' has led to its close relationship with the Fairtrade Federation. As a member of its expert panel, and as a road-test project host, the ICSEA PoA is providing valuable feedback to Fairtrade and the Gold Standard for the design of the Fairtrade Climate Standard.

5. ASSESSMENT OF THE RESULTS AND IMPACTS OF THE PROJECT

5.1 Relevance

The project has remained faithful to its original objective of improving the lives of ordinary households through the supply of ICS, and the multiple benefits generated by them. Each new CPA applicant has been assisted by ICSEA staff to conduct an

effective Local Stakeholder Consultation, at which the views of a wide range of stakeholders have been documented.

New ICS Supplier Organisations have been briefed about climate change, the carbon markets and the benefits of ICS. From all these meetings and training sessions multiple feedback views have informed and influenced the implementation of the project.

5.2 Effectiveness

All the objectives of the project have been achieved – although the duration of 69 months compared to the planned project of 24 months has considerably exceeded original expectations. Persistence and networking has paid off in the face of the many external delays and frustrations that the project has faced. By being the pioneer in the field, the project has had to use its wits to cope with these delays, and to constantly juggle time and budgets to keep the project on track.

Creating the PoA has been a very risky venture, hence no loans have been used (other than a hedged loan to create the Ignition Fund). Grants from development partners and shareholder's equity and loans have kept ICSEA Ltd functioning.

It was originally expected that the Nordic partner would have been able to link the project to ICS initiatives across the East African CARE country offices. In the event, no such initiatives were forthcoming, and this delayed the initial process of adding further CPAs. The project team then looked to other groups and organisations, and this has had a beneficial effect of identifying the kind of active, results-based, private sector partners that will clearly form the bulk of future CPA applicants.

5.3 Efficiency

The ICSEA PoA is registered with the CDM until 2040, and each CPA can be a member for 21 years. The first issuance of CERs took place in 2014, so it is still too soon to assess the cost efficiency of the project. An unlimited number of CPA projects and countries can be covered by the project. A good quality voluntary buyer for the first CER issuance was identified and the sale was a good learning experience.

However, as a demonstration of the ability to develop and implement multi-country fair trade PoAs, that have the potential to change lives in positive ways, the project has been a bargain on multiple levels, and the efficiency of the PoA approach over the earlier standalone project by project model has been effectively demonstrated – see <http://cdm.unfccc.int/contest/CDMfilms/index.html>

5.4 Impact

The main impact of the project has yet to come – this will depend on the ability of the ICSEA team to scale up the number of CPAs, and the geographical coverage of

the PoA. When this happens the number of households benefiting from ICS will rise exponentially. Compared to a usual donor-supported project that finishes when the funding is over, a sustainable structure has been created that will endure until at least 2040.

There has been a considerable demonstration effect in showing that complex PoAs can be organised in LDCs in Africa to suit local conditions. The ICSEA PoA is the first Gold Standard project without an Annex 1 project participant. There is now a fair trade alternative for organisations wanting a route to earning carbon finance that does not involve handing over a significant proportion of their carbon credit earnings to consultants, brokers or financiers.

5.5 Innovativeness and learning

The project was the first registration of a multi-country PoA in the world, and the first to expand its geographical coverage with a Post Registration Change addition of two more countries. It has now pioneered the addition of a second methodology. The main registration documents are publicly available on the CDM website, and are there for others to learn from and use.

A supporting suite of legal agreements and management templates has also been developed, some of which are now in the public domain. The ICSEA team has acquired a detailed knowledge of how to create and operate such a complex PoA as actual practitioners, rather than as consultants, and this information has been shared with the CDM and Gold Standard. The team hosted a delegation from India (supported by GIZ) and shared practical tips on how best to operate a PoA. Many other visits are now taking place.

The importance of annual stove maintenance being funded from the stream of carbon finance has been consistently advocated by the project. This will ensure that the switch away from traditional inefficient stoves becomes permanent, and there will be few lapses by users going back to their old stoves. Maintenance=Monitoring=Marketing is ICSEA's way of packaging this important lesson. The message about the need for regular maintenance is now becoming universal, yet it was hardly ever mentioned when the project started.

Further efforts to disseminate ICSEA's experiences are expected via its membership of Nexus Carbon For Development as part of a collaborative South-South effort, if additional funding can be raised.

Currently UCB is involved in using the lessons learnt in PoA creation and management to apply these to an A/R forestry PoA involving climate change mitigation and adaptation elements.

6. SUSTAINABILITY AND POTENTIAL FOR SCALING UP AND FOLLOW-UP INVESTMENTS

The ICSEA PoA is registered with the CDM until 2040, and will continue to grow into the foreseeable future. Carbon prices being paid by voluntary offset buyers (upwards of EUR10 per CER) are sufficiently attractive to create an incentive for more CPAs to participate in the PoA. Accreditation to the Fairtrade Climate Standard will offer an additional price premium.

Income from Inclusion, Database and Monitoring & Verification Fees will sustain the operation of ICSEA Ltd - the Coordinating & Managing Entity (CME) of the PoA. It is currently about to break even as a result of the new batches of CPAs, but still requires further grant funding to develop the CME database, to extend and market the PoA and for Ignition Fund support to new CPAs.

The ICSEA PoA is now actively engaged in sourcing further funds to scale-up the reach of the PoA, and thereby to achieve economies of scale in its operations, which will allow it to lower its fees. Raising additional finance for the Ignition Fund for member CPAs by collateralising their stream of carbon finance is an important next step, for which partners are being sought.

The very nature of a PoA makes it an ideal candidate for scaling up. Funding applications are being submitted to as many potential funders as time permits. However, it is essential to show new Supplier Organisations that their first moves into ICS carbon finance can be de-risked. Hence the need for grants and funding on impact investment terms are still needed. The ICSEA team has demonstrated that it can effectively handle such funding.

To grow the PoA, new equity investors are now being considered, but this is not without the risk of compromising the PoA's management flexibility to respond quickly to changing circumstances.

Fairtrade Climate Standard accreditation will ensure that the business case for ethical behaviour is well understood by all CPAs. Further funding to publicise the obvious gender, health and environmental aspects of the PoA is being sought.

7. FINANCIAL REPORTING

A final financial audit of the project was carried out by A.H.Thakkar (attached as Annex 1). Over the project period a total of EUR 691,434 was spent compared to the final project budgeted figure of EUR 687,684 (original was EUR 707,684).¹

¹ No revenues earned from the sale of cookstoves manufactured by CPA#1 (International Lifeline Fund) during the project period were recorded by the project, as this activity was outside the scope of the NCF project boundary.

Since the final audit, additional funding has been secured from other sources. This co-financing has been:

- Loan funding from Nexus Carbon For Development to start the ICSEA Ignition Fund. (USD 45,000 = EUR 40,348)
- Support from KfW for their hiring of Perspectives to provide consultancy support with the documentation for the Post Registration Change submission of a second methodology (AMS-I.E) for the ICSEA PoA (amount not disclosed to us, but approx. EUR 35,000)
- Support from Belgian Technical Cooperation for the DOE's fees for the PRC validation (approximately EUR 7,500),
- A GIZ contribution to the Ignition Fund of EUR64,641

NCF Final summary report:

Cost and Financing Table

Organization	Costs, EUR	Financing, EUR						
		NCF	Grantee (CARE Dk)		UCB		Revenues from the project	Total
			Cash	In-kind	Cash	In-kind		
Grantee (CARE Dk)	273,884		101,158					101,158
UCB	417,550				246,434			246,434
NCF		343,842						343,842
Total	691,434	343,842	101,158		246,434		0	691,434

Final Revised Budget²

Organization	Budget, EUR
Grantee (CARE Dk)	137,537
UCB	206,305
NCF	343,842
Total	687,684

² Based on revised Annex 2b table, "Budget, Milestones, Reporting & Grant Disbursement"

Additional external support organised by UCB for the ICSEA PoA

Organization	Financing, EUR		
	UCB		Total
	Cash	In-kind	
Since 31/5/15			
Nexus Carbon For Development/GACC/Gold Standard – De-risked loan to UCB to establish the Ignition Fund (as envisaged in the NCF project document) to support applicant CPAs	40,348		40,348
KfW grant for consultancy services from Perspectives to support the Post Registration Change (PRC) to add AMS-I.E fuel switch to renewable biomass fuels methodology		35,000	35,000
Belgian Technical Cooperation grant for PRC DOE validation services	7,500		7,500
GIZ grant to the Ignition Fund to support applicant CPAs	64,641		64,641
Total Additional	112,489	35,000	147,489

8. CONCLUSIONS AND RECOMMENDATIONS

The support from NCF provided the essential long-term funding for the whole period of the preparation and planning of the PoA, and for its subsequent establishment. Despite the much longer than expected duration of this process, NCF was able to extend the timescale of its support to match ICSEA’s progress in achieving the milestone events. This was a flexible and supportive process, enabling the project to succeed.

Annex 1 **Final Audit Report (Previously submitted)**

Annex 2 **Financial Report (Previously submitted)**

Annex 3 **Other supplementary documentation**

1. Evidence regarding the commitment of at least 4 more CPAs to be included in the PoA
2. Comparison of indicators in original application and agreement with the achieved and on-going results.

1. Evidence regarding the commitment of at least 4 more CPAs to be included in the PoA (original email already forwarded to NCF).

<p>Subject: Inclusion of CPAs: PoA 7014 Improved Cook Stoves for East Afric...</p> <p>Date: Saturday, 24 September 2016 at 15:56:38 East Africa Time</p> <p>From: CDM Programme of Activities Registration</p> <p>To: anubhav@carboncheck.co.in, amit@carboncheck.co.in, vikash@carboncheck.co.in, projects@carboncheck.co.in</p> <p>CC: billfarmer@ugandacarbon.org</p> <p>Dear Operational Entity,</p> <p>This is to inform you that the CPAs submitted on 24 Sep 2016 14:55:07 GMT+2 have been included in the CDM PoA Improved Cook Stoves for East Africa (ICSEA) (7014).</p> <p>Information on this inclusion and related documents are available on the UNFCCC CDM web site (https://cdm.unfccc.int/ProgrammeOfActivities/inclusions/gotolnc?id=JS1DAPXE93K8L40MV7C5FWTOGHZYRU).</p> <p>Yours sincerely,</p> <p>Your CDM team UNFCCC secretariat</p> <p>(inclusion ref: JS1DAPXE93K8L40MV7C5FWTOGHZYRU)</p>

2. Comparison of indicators in original application and agreement with the achieved and on-going results.

1. Relevance, climate change and development impacts; innovativeness		
	Original application	Achieved & on-going results
7.2 Climate change impacts	<p>The direct climate change impact of the project is in form of reduced GHG emissions by substituting inefficient cook stove technology with clean burning and energy efficient stoves.</p> <p>The expected verifiable GHG reduction by the PoA in operation with 16 CPAs is 568,679 tCO₂e each year. Over the maximum 21 year lifetime of each CPA this equals a GHG emission reduction of 11,942,259 tCO₂e. Following the CDM methodology that has been selected, the beneficial effects of lower methane, black carbon and other gases are not accounted for. On a conservative estimate these are around half of the actual GHG emission reductions that are accounted for following the CDM methodology. As a consequence the annual GHG emissions reductions are 284,399 tCO₂e higher, with a total effect of 853,018 tCO₂e p.a. or almost 18m. tCO₂e over the 21 year lifetime of the 16 CPA's.</p> <p>Besides the positive mitigation impact of the project, the effect of reduced consumption of firewood and charcoal also reduces the pressure on natural forests and other standing trees. An increase in forest cover in the four countries will in many cases lead to an increase of the adaptive capacity to climate change for the farmers living in currently deforested areas. This reduction of deforestation and forest degradation will have a huge positive impact on the resilience of the people living on and off the land.</p>	<p>In addition to reducing GHG emissions by the introduction of more efficient stoves, the project invested additional time and funds over the past 2 years to add a second fuel switch methodology (AMS.I.E) via a Post Registration Change (PRC). This is another world first for the PoA, and will encourage members to introduce renewable biomass fuels, rather than to continue with the burning of non-renewable charcoal and wood. This will enhance the GHG reductions per household – for example by some 30% for previous users of non-renewable charcoal.</p> <p>The previously estimated figures for the lifetime of the PoA will be exceeded as a result of this PRC.</p> <p>The number of CPAs to be covered by the PoA will also exceed the previous prediction of 16. In addition to the recently added 4 Supplier Organisations (SOs) with 1 CPA apiece, making 5 CPAs in total, a pipeline of 14 new SOs is currently being managed, with an escalating number of fresh</p>

		<p>applicants being added each month. Several of these will have multiple CPAs over the 28-year lifetime of the PoA.</p> <p>All the SOs are predicting the addition of more than one CPA, but funding for the scaling-up of their stoves activities will be limited by poor access to working capital and investment funds. Hence ICSEA Ltd's current plans for the establishment of a crowd-funding platform, and its submission to the Green Climate Fund to address these financial constraints.</p>
7.3 Climate change impact indicators	<p>Indicators to track the climate change impact are:</p> <ul style="list-style-type: none"> • GHG emissions reduction: The number of CER's issued to each CPA during the project and afterwards. • Black carbon emissions reduction: Measured as reduced particle matter emitted by burning biomass in improved cook stoves using the PEMS system at CREEC at Makerere University, Kampala, Uganda. • Increased resilience to climate change measured by the extent of reduced deforestation from improved fuel efficiency as an indicator. 	<ul style="list-style-type: none"> • A first issuance of CERs was achieved for the ILF CPA#1. This has encouraged other organisations to approach the PoA. 4,052 CERs issued, and further 30,000 t CO₂e reduced (to be verified). • Assistance was given by ICSEA Ltd to the CREEC laboratory to set up its PEMS system and the results from their on-going work will be used by the PoA to document black carbon emission reductions. This laboratory is the focus for both GACC and World Bank ACCES support. • Improved fuel efficiency is measured for each new stove being used by members of the ICSEA PoA in accordance with the ICSEA Rating Test Protocol, and is the basis for the CER calculation for each CPA.
7.5 Development impacts	<p>Current cooking practices also result in indoor air pollution. According to WHO,³ lower respiratory diseases account for around 159,000 deaths annually in the four countries combined. A conservative estimate is that 70% of this is caused by particulate matter and smoke from cooking. Assuming that cleaner burning from improved cook stoves on average removes 90% of these pollutants, the health impact can be quantified to 3,235 avoided deaths a year with the 16 CPA's. During the lifetime of the PoA this is 67,934 deaths.</p> <p>This involves mainly women and young girls who are in charge of cooking. Infants are often carried on the backs of their mothers or sisters, or are kept close to the warm hearth. As a consequence they are also the ones most at risk. A conservative estimate is that around 75% of the deaths caused by indoor air pollution involve women and children. Comparing the effect of indoor air pollution with other diseases shows the severity of the problem. In Uganda for instance, indoor air pollution caused by cooking is more lethal than malaria.⁴</p> <p>Besides the positive health impact of improved cook stoves, they also have a direct positive impact on livelihoods. The use of inefficient cooking technologies means that women and girls spend more time and money on collecting or purchasing firewood. Collecting firewood is often a dangerous activity which exposes women and girls to risks of assault and rape especially in areas close to refugee camps or in conflict zones such as Northern Uganda or borders to Congo.</p> <p>Assuming that there is a fifty-fifty division of charcoal and firewood stoves supported by the PoA in the 16 CPAs, in the four countries</p>	<p>These development impacts are being independently assessed by the Global Alliance for Clean Cookstoves (GACC) of which ICSEA is a member⁵.</p> <p>The measurement of Disability Life Years Saved (DALYs), based on Household Air Pollution (HAP) is now starting to be an indicator that the Gold Standard is monitoring, and we expect this to be followed by Fairtrade. We anticipate that this will be a metric that will feature in future Gold Standard and Fairtrade monitoring requirements, and should enhance the value of the CERs once this becomes a standard reporting requirement. UCB and ICSEA staff have been involved with the World Bank's Africa Clean Cooking Energy Solutions Initiative (ACCES) over the past 4 years, and this is currently generating updated statistics on the benefits from improved cook stoves that ICSEA is citing in its work.⁶</p> <p>The time saving and financial benefits to households predicted in the original application still appear to be reasonable estimates, and were topics that the CDM featured in the film made by them of the PoA and the first ILF CPA.</p> <p>There is likely to be considerable variation</p>

3 WHO, Country Health System Fact Sheet 2006, Rwanda, WHO, Country Health System Fact Sheet 2006, Uganda, WHO, Country Health System Fact Sheet 2006, Kenya, WHO, Country Health System Fact Sheet 2006, Tanzania, <http://data.un.org/CountryProfile.aspx>

4 WHO; Public Health and the Environment, 2009: Country Profile of Environmental Burden of Disease, Uganda. Geneva 2009

5 GACC, Scaling Adoption of Clean Cooking Solutions through Women's Empowerment

6 ACCES, Clean And Improved Cooking In Sub-Saharan Africa, World Bank, November 2014, second edition.

	<p>the average annual charcoal expenditure using a low estimation is around 100€, and the time spent collecting firewood is on average 2 hours a day. If the fuel saving on average for an improved wood stove is 38%, and 50% for an improved charcoal stove, the reduced resources spent on cooking fuel can be calculated.</p> <p>The annual saving will be 14.4 m€ for buying charcoal and 9,120 years in saved productive time by reduced effort in collecting firewood. The latter is especially important in labour constrained households. During the 21 year lifetime of the CPAs this amounts to more than 300 m€ and 191,000 years of productive time.</p>	<p>between CPAs in the speed at which they reach their maximum size allowed by the CDM. The most limiting factor is their SO's access to working capital, and their securing of investment funds to establish modern briquetting units. ICSEA Ltd is working closely with the leading supplier of briquetting equipment (C.F.Nielsen from Denmark) to pilot its proposed moveable Village Briquetting equipment, for early use by ICSEA members.</p>
7.6 Development impact indicators	<p>Development indicators will be measuring the saving in cash and productive time and the reduction in indoor air pollution. The indicators will be separated for men and women. The following indicators will be used:</p> <ul style="list-style-type: none"> • Average cost of charcoal • Average time spent collecting firewood in the four countries • Fuel saving for each CPA (to be used to calculate savings in time and cash) • Reduction in indoor air pollution measured as reduced deaths (separated for men and women) 	<p>As the number of CPAs entering the Monitoring, Verification & Issuance phase of their improved cook stoves projects rises, so these indicators will be measured.</p> <p>It is still too early, with the very limited amount of data available, to measure development impact indicators, other than by reference to work cited by GACC and the World Bank from studies in Sub-Saharan Africa. 22000 HH benefitting so far</p>