Sustainable Development Verified Impact Standard

INSTALLATION OF HIGH-EFFICIENCY WOOD-BURNING COOKSTOVES IN MALAWI

CQuestCapital

Document Prepared by

C-Quest Capital SG Stoves Private Ltd

Project Title	Installation of high efficiency wood burning cookstoves in Malawi
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Project Location	Republic of Malawi
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Project Lifetime	01 December 2020 to 30 November 2030, ten-year lifetime
Monitoring Period of this Report	01 December 2020 to 28 February 2023
History of SD VISta Status	No previous attempts at SD VISta certification made to date
Other Certification Programs	VERRA Verified Carbon Standard (2342)
Expected Future Assessment Schedule	Initial validation/verification anticipated in 2023

CONTENTS

1 SUMMARY OF SDG CONTRIBUTIONS

Table 1: Summary of SDG Contributions

Row number	Quantitative Project Contributions during Monitoring Period	Contributions during Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
1	The number of drip irrigation kits distributed from MP1 to MP4 is 818, leading to efficient water management, which in turn is enabling the households in Malawi to grow crops and vegetables during the dry season. Till the current monitoring period (i.e., MP 4), 175,000 bamboo seedlings have been distributed, which will help in improving the soil quality of the project area and thereby improving the ecosystem.	a) Promote sustainable agriculture by distributing drip irrigation kits in 2000 beneficiary households enabling efficient water management and increased household ability to grow crops/vegetables in dry season. b) Promote resilient agricultural practices that help maintain ecosystems and progressively improve land and soil quality by distributing approximately 268,273 bamboo seedlings to beneficiary households to be used as a perennial source of cooking energy in these households. The bamboo plants will not only provide	2.4	Project specific indicator: a) Number of households receiving drip irrigation kits under project activity b) Number of bamboo seedlings distributed amongst the beneficiary households	Implemented activities to increase	3.2#2	SD VISta labeled VCUs

		sustainable wood fuel to households but will also improve soil quality.					
2	For the current monitoring periods (MP1 to MP4), the average $PM_{2.5}$ reduction per stove is 0.005477371 tons/stove. The survey conducted to substantiate the PM 2.5 reduction due to project stove usage depicts that about 94% of the respondents have felt reduction in smoke and soot levels near the cooking area and ~50% of respondents experienced reduced levels of itchiness of eye associated with cooking on open fire. For 44% of households (mean household reporting improvement in health), the average reduction in PM 2.5 is 0.00241 tons/annum.	Contribute to improved health and well-being brought about by reduced levels of fine particulate matter ($PM_{2.5}$) emissions within 0.25 million households by approximately 47[1]% below baseline emission level of 3.9 g/kg fuel[2].	3.9	Project specific indicator: Reduction in $PM_{2.5}$ emissions	Implemented activities to decrease	3.1#3	SD VISta-labeled VCU
3	Vocational training and project related training with respect to successful implementation of a programme, appropriate methods of conducting surveys, carrying out maintenance activities etc. in addition to issues related to climate change was	Contribute to increasing vocational and relevant skills of at least 50 local individuals (with a focus on targeting women and youth) by providing non-formal education and training on	4.3	Project specific indicator: Number of individuals who received any informal training	Increase	3.1#4	SD VISta-labeled VCU

[1] Executive Summary: Impact Analysis of Malawi Rural Wood Stove and Jet Flame Kit Program

[2] $PM_{2.5}$ emissions from three stone fire. Source: Clean Cooking Catalog

	provided to 5 individuals associated with the project.	issues related to climate change, with specific skill building in operations and surveying activities related to stove distribution and its monitoring under VCS					
4	As per the survey, 90% of the households have reported that the collection of fuelwoods is done by adult women (age ≥ 18), whereas 4% of the households primarily rely on young girls (age < 18) for collection of fuelwoods. In comparison to the baseline scenario, where the time spent in collecting fuelwood is 2 hours per household per day, the time spent in collecting fuelwood in the project scenario is 0.4 hours per household per day. Hence, the total time saved in all households where women are primary fuel wood collectors, thereby reducing their drudgery, is 432957595 hours. The project survey results augment the above claim as 52% of the respondents reported to having experienced fewer trips for wood collection freeing up their time for other activities.	Contribute to reducing drudgery and gender inequality in 0.25 million households, especially for women and children by saving time spent in collecting fuel wood below the baseline fuelwood collection time considered at an average of 1.9 hour/day/household for rural areas using an open fire or similar traditional cookstove. The project will lead to time savings by approximately one hour every day[3]. The women can use the time saved for doing more productive activities or personal care.	5.4	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age, and location.	Implemented activities to decrease	3.1#5	SD VISta-labeled VCU

[3] Berkeley Air Monitoring Group: Effects on gender-related outcomes after the introduction of improved cookstoves in rural Zambia

5	The total number of TLCRS distributed in till MP 4 is 348,043, thereby provide access to clean cooking technology to 174,022 Malawian households.	Increase access to clean cooking technology with TLCRS installations in approximately 0.5 million Malawian households under the project lifecycle	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Increase	3.1#1	SD VISta-labeled VCU
6	A total of 5 individuals were directly and indirectly employed under the project activity during the current monitoring period in Malawi for various activities related to project implementation, maintenance, and monitoring.	Contribute to generation of employment in informal sector (total economy, agriculture, and non-agriculture) by contracting locals with a target employment of 50 employees for varying lengths of time over the project lifetime with a focus on hiring females. Employment comprises all persons of working age who, during a short reference period (minimum one week), or full time[4] will be engaged in any activity to produce goods or provide services for pay or profit	8.3	8.3.1 Proportion of informal employment in non-agriculture employment, by sex	Increase	3.1#6	SD VISta-labeled VCU
7	Till MP 4, Ener-G-Africa has generated a revenue of 333,030.00 USD by distributing 55, 505 metal parts of the stove to different organizations, thereby contributing to Malawian economy.	Contribute to increase in resilient economic infrastructure by assisting in establishing Ener-G-Africa (EGA), a stove part manufacturing unit in Malawi	9.2	Project Specific Indicator: Annual revenue of Ener-G-Africa that comes from CQC's stove part orders.	Implemented activity to Increase	3.1#7	SD VISta-labeled VCU

[4] Full time employment will be defined in accordance with the Employment Act of Republic of Zambia.

		and to support sustainable industrialization					
8	Total emission reduction in the current monitoring period is 1,787,030 tCO_2 eq.	Contribute to GHG reduction through an estimated reduction of ~75.46 tCO_2e per stove for the ten-year period owing to the replacement of baseline stoves with TLCRS	13.0	Project Specific indicator: Reduction in emissions as compared to baseline scenario (open fire)	Increase	VCS Verification report for the period 01-12-2020 to 15-09-2022	SD VISta-labeled VCU
9	The project has resulted in saving ~2.73 tons of biomass per stove over this MP from 348,043 ICS installation.	Contribute an estimated reduction of deforestation of ~3.9 tons of woody biomass, per stove, per year, from forests surrounding the communities and reducing pressure on forest reserves	15.2	15.2.1 Progress towards sustainable forest management by increasing above ground biomass in forests	Implemented activities to increase	4.1#1	SD VISta-labeled VCU

2 PROJECT DESIGN

2.1 Project Objectives, Context and Long-term Viability

2.1.1 Summary of Project Sustainable Development Objective(s)

1. C-Quest Capital's (CQC) Improved Cookstove (ICS) project – 'Installation of high efficiency wood burning cookstoves in Malawi – and the complimentary secondary projects will enable and enhance household level access to sustainable development objectives by distributing, installing, and maintaining fuel-efficient ICSs in Malawi. The project aligns with and will contribute to sustainable development objectives outlined in 'Table 1: Summary of SDG Contributions' and explained below:

1. Economic Wellbeing

- **SDG 8***:* Employment of local population on temporary or full-time basis with particular attention to women folk. The employment opportunities will be generated for project implementation including stove distribution, spot checks and periodic surveys for ensuring streamlined operations of the project (8.3)
- **SDG 9:** Assisting in the establishment of Ener-G Africa (EGA), a stove part manufacturing unit in Malawi to increase resilient economic infrastructure and to support sustainable industrialization (SDG 9.2)

2. Social Wellbeing

- **SDG 2:** Improved food security for beneficiaries and their families by enabling the adoption of resilient and sustainable agricultural practices among the end-users. The project activity involves distribution of drip irrigation kits to 818 households which will lead to efficient water management capacitating households to grow crops and vegetables in the dry season as well when water availability is the confining factor for plant growth (2.4).
- **SDG 3***:* Reduction in $PM_{2.5}$ emissions in 174,022 households who received TLCRS and hence bringing down its exposure levels in women and children who happen to spend considerable time near the hearth. (3.9)

  Reduce incidences of accidental burn in infants and children with use of TLCRS due to its closed combustion chamber and stable base
- **SDG 4***:* Increase the number of local individuals receiving vocational and relevant skills related training by introducing them to issues associated with climate change, human health, and well-being etc. The identified individuals are equipped through these trainings to carry out project related activities during different phases of its implementation. (4.3)
- **SDG 5***:* Reduce women's and children's drudgery by reducing the time and effort spent in cutting, collecting, and carrying fuelwood for cooking (5.4)
- **SDG 7***:* Increase access to modern and reliable energy source for cooking in the rural communities of Malawi (7.1)

3. **Environmental Wellbeing**

- **SDG 13***:* Reduce carbon emissions by approximately 4.5 tCO_2e/year per ICS as compared to the baseline stoves used for cooking in the household, this does not include black and brown carbon (13.0)
- **SDG 15**: Reduce deforestation and forest degradation due to reduced demand of fuelwood required for cooking (15.2)

2.1.2 Description of the Project Activity

CQC's ICS project, a low-emission climate-resilient project, was initiated in response to need to reduce greenhouse gas (GHG) emissions to combat the worsening climate crisis that produces significant negative impacts on the most vulnerable populations residing in sub-Saharan Africa. The project aims to facilitate replacement of rudimentary cooking practice of using open fire or three-stone fires (TSF) with improved cookstoves.

The primary activity under this grouped project, is the installation of ICSs

Improved Cookstoves

The primary project activity is the distribution and installation of the TLC Rocket Stove (TLCRS), a high-efficiency, long-life metal, and brick stove that transitions households away from traditional open fire cooking to cleaner, more efficient cooking solutions with renewable biomass fuels. The TLCRS is offered in exchange for in-kind contributions of materials and labor only, as the rural population's disposable cash is limited, and paid positions, where possible, are often informal and operates external to the cash economy.

Activity	Impact Projection	Impact in current MP	Negative Impact	Mitigation	Evidence	Included in this MP
ICS-Reduced drudgery	Reduction in fuelwood collection time by an average of 1 hour everyday	The project results in a reduction in time spent in collecting fuelwood by women and young girls by 11.5 hours per week per household, thereby reducing the drudgery of women and young girls, that they experienced during baseline scenario.	No perceived negative impact	Not required	Survey	Yes

ICS-reduced indoor air pollution	47% reduction from baseline level	The amount of PM2.5 emissions saved per 1 kg of fuel due to shift from baseline stove to project stove is 1.83 grams. The reduction in PM 2.5 emission post intervention is expected to benefit the end users in terms of better respiratory health.	No perceived negative impact	Not required	Survey	Yes
ICS-climate mitigation	75.46 $tCO_2eq.$/ stove/for 10-year crediting period	1,787,030 tCO_2 eq. for the current monitoring period for 348,043 stoves.	No perceived negative impact	Not required	VCS ER sheet	Yes
ICS-reduced deforestation	~3.9 ton/stove/year	The project has resulted in saving ~2.73 tons of woody biomass per stove over this MP.	No perceived negative impact	Not required	VCS ER sheet	Yes

Paid Opportunities

Paid opportunities have been created through the Stove Champion (SC) program under which enumerators are selected and trained to service 500-1000 households and be in direct communication with their female clients. The programme serves two benefits, while on one hand locals get employment opportunities, on the other it makes sure that stove users are constantly in touch with stove champions enabling good practice in stove use and maintenance. It also reduces technology drop-off rates.

Activity	Impact Projection	Impact in current MP	Negative Impact	Mitigation	Evidence	Included in this MP
Employment generation	50	5	No perceived negative impact	Not required	Contracts	Yes

Bamboo Seedlings

CQC has distributed 175,000 bamboo seedlings to households with the TLCRS primarily in the Central district and is in the process of following up with these households to check on stove condition and bamboo survival rate. This distribution will continue as a secondary project activity, as an incentive to use and maintain the stoves and to contribute to firewood supply at the household level.

Activity	Impact Projection	Impact in current MP	Negative Impact	Mitigation	Evidence	Included in this MP
Distribution of bamboo seedlings	175,000	268,273	No perceived negative impact	Not required	Purchase Invoices	Yes

The bamboo secondary project is amplified by education to households on the benefits of bamboo, training on best practices to plant bamboo, and encouragement to plant bamboo seedlings alongside vegetable gardens for increased nutrition benefits, reduction in time as vegetables and bamboo can be watered simultaneously and can serve as live fencing to protect gardens from roaming animals.

Training

CQC staff in each of the host countries are trained using carefully curated programmes to equip them with knowledge and skills for carrying out various activities related to project implementation, maintenance, monitoring etc. Training will generate positive impacts on community groups by enabling community members to acquire alternative skills and build capacity.

Activity	Impact Projection	Impact in current MP	Negative Impact	Mitigation	Evidence	Included in this MP
Informal Training	50	5	No perceived negative impact	Not required	• Training session records • Photographs • Knowledge Material	Yes

					• Attendance sheet	

Drip Irrigation Kits

CQC in partnership with USAID has distribute 818 drip irrigation kits to individual households till MP 4. The use of drip kits will enable vegetable production during the dry season, improving the availability of nutritious food and providing a revenue opportunity through the sale of fresh food for greater community-level access.

Activity	Impact Projection	Impact in current MP	Negative Impact	Mitigation	Evidence	Included in this MP
Distribution of drip irrigation kits	818	2000	No perceived negative impact	Not required	Purchase Invoices	Yes

Domestic Manufacturing Market Development

Ener-G-Africa (EGA), a Malawian entity formed by CQC (as a minority shareholder) and Malawian entrepreneurs, manufactures all metal stove parts for CQC's rural Sub-Saharan Africa TLCRS program. Since EGA started manufacturing metal parts for these stoves, since the project initiation, they have produced around 55, 505 sets of parts.

2.1.3 Implementation Schedule

Date	Milestone(s) in the Project's Development and Implementation
01 December 2020	Project Start date: Project Activities commence with TLCRS installations
01 September 2021	Listing of VCS PD on VERRA
25 November 2021	Registration of project under VCS
09 July 2021 to 20 July 2021	VCS Monitoring for MP 1st December 2020 to 15th April 2021
15 July 2021	CQC submits the project documents to VERRA for listing under SD VISta
01 September 2021	Listing of SD VISta PD on VERRA
14 September 2021	Commencement of validation for SD VISta
02 March 2022	First issuance of VCUs received under VCS project
07 January 2022	Positive Validation opinion for the SD VISta project received from the VVB

10 February 2022	Submission of project documents to VERRA for SD VISta project registration
01 December 2020 to 30 November 2030	Concurrent monitoring and evaluation
30 November 2030	The 10-year project validation period concludes with a projected 0.5 million stoves installed.

2.1.4 Project Proponent

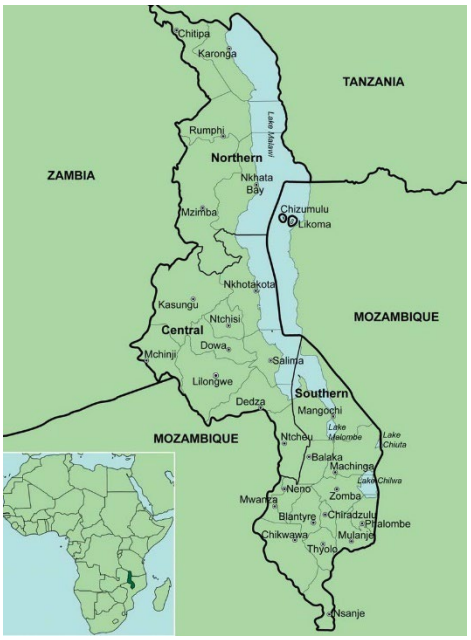
Organization Name	C-Quest Capital SG Stoves Private Limited
Role in the Project	Project Proponent
Contact Person	Ken Newcombe
Title	Director
Address	38 Beach Road #29-11, South Beach Tower, Singapore (189767)
Telephone	+1 202 247-7976
Email	Cqc-operations@cquestcapital.com

2.1.5 Other Entities Involved in the Project

No other entity is involved with the CQC TLCRS Project.

2.1.6 Project Location

The ICS project and secondary project locations will take place in the geographic boundaries of the Republic of Malawi with geographic coordinates 13°15'15.5" S latitude and 34°18.091' E longitude[5].



2.1.7 Project Description Deviations

No project description deviations were applied during this monitoring period.

2.1.8 Threats to the Project

Human-Induced Threats

Threat: Stove users' lack of upkeep of stove resulting in either malfunctioning of the stove as designed or lack of stove use.

Solution: CQC conducts routine spot audits early in the process of construction of stoves in each main geographic focus for mass stove installation to detect defects in stove construction, maintenance, and sub-optimal stove use. CQC requires its Implementing Partners (Ips) to hire, train, and supervise stove builders and users, including Stove Champions, to visit each household to inspect their stoves, up to 2 times per year. This dramatically reduces the threat listed above. Additionally, CQC contracts independent third-party auditors or local CQC staff to perform spot checks or sample size reviews to identify lapses in stove upkeep. Upon receiving these reports CQC contracts sub-proponents, called Stove Champions, to perform follow-up visits to households to provide additional education and encourage stove upkeep and use.

Where metal parts of ICS's commonly found on the market are made of low-grade steel, CQC has upgraded the metal parts for the TLCRS are made of higher-grade heat resistant steels, determined by extensive stress testing by Colorado State University, USA, to have a lifespan of

[5] Malawi Geographic coordinates - Latitude & longitude (geodatos.net)

a minimum of 10 years. Metal parts include a fuel shelf that doubles as a brick mould, pot skirt, and stovetop.

Threat: Failure of Behavior Change resulting in high levels of non-adoption

Solution: CQC continuously researches the impacts of behavior change for successful adoption. Study outcomes, whether formal or informal, are included in future training and community sensitizations to continue to positively, shape knowledge, enhance positive peer-to-peer influence, and increase women's sense of empowerment feeding into social cognitive theory on identity and self-belief. Non-adopters and non-implementors are specifically engaged to understand the barriers to success, these outcomes and conclusions are included in future training and disinformation in countered through community sensitization.

Threat: Carbon-financed stove distribution is not shown to have an increased impact on household uptake.

Solution: While research suggests that providing a subsidized ICS to the household does not have a positive impact on successful adoption, (owing to lack of perception of value of the stove), there is enough evidence on other hand to show, that knowledge of time saving and awareness of the correlation between health benefits and reduced smoke improves adoption rates. Although CQCs ICS provided to households is subsidized, training highlights time savings and increase health benefits (decreases in acute respiratory illness for mothers and children, decreased morbidity/mortality from HAP, and increased nutrition status through retention of nutrients due to more uniform cooking), as well as previous users reasons for adoption (cleanliness of pots, increased social standing, appearance, safety, less smoke). Awareness of the later impacts of ICS cooking is used to counter the threat.

Threat: Envisaged lobbying by fuel vendors to restrict communities from switching to project cookstoves as they might experience a loss in their income levels

Solution: This threat is not of practical significance as according to the DHS survey 2015-16[6], 91% of rural population in Malawi relied on wood fuel as primary source of cooking fuel while the national average stood at 80.9%. With majority of people depending on wood for cooking it is unlikely that the reduction in demand for wood within project boundary would greatly impact the stakeholders involved in selling wood. So, any reduction in demand for wood fuel within project boundary will shift the stakeholders selling wood to outside project boundary, without causing significant reduction in their business as there would still exist a considerable demand for the product.

Nature-Induced Threats

Threat: Climate Crisis induced displacement/migration (shock-related drought or flood) causing households to change location

[6] Malawi DHS, 2016; https://dhsprogram.com/pubs/pdf/FR319/FR319.pdf

Solution: Although the ICS installed under the project are fixed type of stoves, however, the main body which consists of bricks made of commonly found local elements (5L each of clay, sand, dung, and water) can be easily reconstructed whereas the steel parts can be easily removed and used again in newly constructed stoves. This technology can travel easily with the household in their migration and can be rebuilt at a new location using the steel brick mould which is provided to each end user at the time of stove installation. The end user is also provided with the knowledge and requisite training on construction of the bricks as well as stove assembly should the need arise for them to reconstruct the stoves.

Threat: Continued deforestation and degradation making firewood an untenable source of biomass.

Solution: Although increased scarcity would support the use of the TLCRS, there is the potential that as the population continues to expand, particularly on the African Continent, there may be a point when firewood becomes an untenable source. Although access to modern fuels may not be physically or financially accessible to ICS households in the future, creating more dependence on biomass cooking. CQC trains on the use of small branches and twigs and use of crop residues such as maize cobs for a fast-growth close-to-home source of regenerative biomass. Where possible, CQC will advocate for policy changes and the inclusion of regenerative forestry in governments' low-carbon action plans to support forest protection and regenerative woodlots for sustainable consumption.

2.1.9 Benefit Permanence

To ensure the ICS project's long-term viability and the permanence of ICS and other program benefits, CQC has committed to the following long-term aims:

1. A manufacturing unit EGA, was established in Malawi where the three metal parts of each stove are built, this will continue throughout the project lifecycle. The local stove production will benefit the local economy as EGA offers job opportunities to Malawians, which continues to build the knowledge and skills for long-term inclusion in the formal sector of the national economy.

2. A 'per-household stove used' contribution to the Village and Savings Loans that works to increase the microfinance capital available to community groups to support increased economic projects and income-generating activities. CQC is monitoring the use of and the type of activities that it will fund. Through this, CQC intends to understand the impact of the VSL contributions and if significant, increase the contributions to the VSL for long-term improvement and support of financial literacy and microfinance activities.

3. Implementation and Spot Audit teams will be hired and provided with transportation and smart mobile phones that meet the physical mobility and remote connection requirements of the positions. Transportation provided includes bicycles, motorbikes, or motor vehicles, depending on the position. For Stove Champion and Promotors who may work on a part-time basis, bicycles remain with staff members, contributing to year-round physical mobility that reduces time spent traveling by foot, increases access to local markets to sell income-

generating products, and provides reliable access to local health facilities; overall, acting as a catalyst for upward economic well-being. This is a long-term commitment.

4. CQC is working to make the TLCRS available to all households through the purchase of CQC's 'Stove-in-a-box' kits. This provides the metal components of the ICS and directions on assembling the brick structure that houses the metal components. This 'Stove-in-a-box' program does not replace the projects outlined in section 2.1.2, rather it offers the stove to a section of end users which are not the target beneficiaries of the project – maintaining long-term benefits to Malawi. EGA with CQC's support plans to set up a distribution program for 'Stove-in-a-box' throughout Malawi, increasing availability of clean cooking technology along with other basic goods to rural families.
5. Through CQC training of stove champions, health promotors, communities, and continued individualized education support and training directly to households, CQC provides holistic, long-term environmental, health, nutrition-sensitive awareness, and community resiliency awareness to advance the benefits to stakeholders and maintain project activities and intended outcomes.

Moreover, CQC plans to continue activities until potential beneficiaries have been exhausted and remain committed to the continued improvement of rural livelihoods.

2.2 Stakeholder Engagement

2.2.1 Stakeholder Consultation and Adaptive Management

CQC undertook a local stakeholder consultation (LSC) parallelly with VERRA/Voluntary Carbon Standard (VCS) process between 26 October to 25 November 2020. Since then, it has also reengaged the stakeholders that participated in the feedback for VCS and has continuously sought opinion on project primarily from women, and youth who happen to be often unrepresented.

Stakeholder Group	Stakeholder	Consultation Activities
Directly Affected Parties	Current Beneficiaries (individual, household, and community level)	-Community level sensitization activities -Open communication with implementing partner and CQC Direct -Household SC visits/surveys - Consultations with community/households to provide information and capacity building

	Potential Beneficiaries and Community Groups (individual, household, and community level)	-Community level sensitization activities -Open Communication with implementing partner and CQC Direct -Household SC visits/ Surveys - Consultations with community/households to provide information and capacity building
	Implementing Partners	-Open communication with CQC -Training on impacts of TLCRS and secondary project activities

During the current monitoring period, the following stakeholder interactions were undertaken:

Household Visits/Surveys

CQC engaged with the beneficiaries and their families during visits with households where the TLCRS were distributed to disseminate knowledge about the benefits of the stoves and capacitate them to use the ICs. A total of 348,043 TLCRS installations and corresponding registration surveys were conducted during the monitoring period.

CQC used the spot audit survey to capture beneficiaries' feedback for more continuous channel of communication. This provides a direct period where information is collected to understand the retained knowledge on stove operation, upkeep, as well as benefits. Information related to actual benefits of the stove in context to the SDGs (time saved, reduction in wood collection, less smoke) based on the understanding of the beneficiaries was collected. The spot audit and collected information were used to take informed decisions on implementing partners, impact training materials, and in direct communication with future beneficiaries to increase the adoption rates of the project stoves.

2.2.2 Anti-Discrimination

CQC is committed to providing the best possible climate for maximum development and goal achievement for all its employees and contractors. CQC believes that discrimination in all its forms (gender, race, religion, sexual orientation, or other habits) and sexual harassment and assault have no place within CQC, its implementing partners, employees, contractors, and third-party individuals, and within the projects it designs, funds, and executes.

No complaint of anti-discrimination practices was received during the monitoring period.

2.2.3 Worker Training

CQC provides a detailed employee handbook. It details (i) the way CQC works, (ii) pay and progress, (iii) time away from work and other benefits, (iv) on the job conduct, (v) data security, (vi) safety in the workplace, (vii) anticorruption, antibribery, and anti-terrorism procedures, among other elements.

CQC provides training to country managers and other team managers, as appropriate, once these individuals are trained, they are responsible for providing standardized and regularly revised training and guidance to the teams they oversee and are trained by CQC in a train-the-trainer model. The contractors are also responsible for providing training to the household's primary cooks in construction, maintenance, and best practices in using the TLCRS before the registration of the stove.

Training materials are regularly updated and are available on request.

For the current monitoring period too, employees were trained in various aspects of project implementation and audits.

2.2.4 Equal Work Opportunities

CQC makes every effort to abide by the laws and regulations of the countries it operates in, as well as, US laws, and international statutes, as applicable. When conducting recruitment, CQC prioritizes hiring local community members and offers new opportunities to project beneficiaries as CQC expands operations and job openings arise.

These practices were enforced throughout the monitoring period with specific priority to hiring women, specifically for the Health Promoter and Stove Champions positions.

2.2.5 Workers' Rights

As per the Core Labour Conventions of the International Labour Organisation (ILO), CQC, respects, and works in tandem with the elimination of all forms of forced or compulsory labour, the effective abolition of child labour, minimum age convention, the right to organize, and the elimination of discrimination in respect of paid positions and occupation.

Due care was taken to abide with above throughout the monitoring period and no complaint was received in connection with dereliction of rights of the staff working for CQC in the said project.

2.2.6 Occupational Safety Assessment

To mitigate the rare yet potential occupational safety hazards, CQC makes every effort to contract workers who have lived in the community for several years, this assists in mitigating the occupational hazards through community familiarity, language fluency, and native to the culture. This understanding of traditional values, respect, and working environment in the communities CQC serves support reduction of safety hazards. CQC provides Group Personal Accident insurance to office staff.

These policies were enforced throughout the monitoring period.

2.2.7 Feedback and Grievance Redress Procedure

No grievances were reported during the monitoring period. CQC maintains a contact form on its website as well as the project locations for filing formal or informal grievances and feedback. Spot Auditors are also provided with the responsibility of collecting feedback during internal audits. This process was adhered to throughout the monitoring period.

2.2.8 Stakeholder Access to Project Documentation

In addition to an enhanced focus on verbally communicating information about the accessibility of project documents, among CQC implementing partners, staff, and local community members, CQC will include links to monitoring reports on its website. CQC posts annual reports online in addition to project descriptions. Efforts are made to publish links to these materials across CQC's social media footprint.

As the SD VISta program progresses, the main forms of communication to stakeholders will be through stove champions, social media, and the CQC website. CQC will announce its participation through training, community sensitization programs, social media, public releases, and website.

2.2.9 Information to Stakeholders on Assessment Process

Prior to verification site visit, the end users will be informed about the VVBs visit at least one month in advance. The PP will share an intimation letter in local language, mentioning the date of the site visit, details of the VVB and locations to be visited by the VVB. These letters will be circulated by CQC staff physically.

To facilitate a direct and independent communication between stakeholders or their representatives and the assessor, PP will provide information such as the name of the VVB firm, assessor's team to be visiting, lead assessor's name, email id and contact number of the lead assessor. This will allow the end users to directly approach the assessor's team.

2.3 Project Management

2.3.1 Avoidance of Corruption

CQC and/or its affiliates and subsidiaries, as the primary project proponent, and those entities contracted as implementing partners, are committed to combating any form of corruption, bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion. CQC's employees sign a code of business ethics and conduct form that mandates performance of all duties with honesty, integrity, and impartiality, without improper preferential treatment of any person, and undergo mandatory anti-corruption and antibribery training as a condition of employment. CQC's implementation partners are required to review CQC's anti-corruption and anti-bribery policies and must take anticorruption and antibribery training before performing any project implementation services as a condition of their contract.

2.3.2 Recognition of Property Rights

CQC's implementing partners only install a stove at the informed invitation of the household and CQC's ICS does not infringe or interact with property rights.

2.3.3 Free, Prior and Informed Consent

The project activities will take place with the approval of Village Development Committees and Area Development Committees in a series of consultation meetings as documented. In

addition, ICS is a completely voluntary activity and households in participating villages are free to choose whether they take part or not. Free, prior, and informed consent takes place before installation. For each of the stoves registered under the current monitoring period, the end user had to sign a registration form declaring consent to the programme.

2.3.4 Restitution and/or Compensation for Affected Resources

CQC's installation of an ICS does not affect any party's access to resources or their lands; no negative effects have been identified.

2.3.5 Property Rights Removal/Relocation of Property Rights Holders

The project and associated activities do not involve the removal or relocation of property rights holders from lands or territories, nor do they force rights holders to relocate activities. All bamboo planting and ICS activities are voluntary.

2.3.6 Identification of Illegal Activities

Theft and corruption are commonly identified as illegal activities in Malawi. As there is no transfer of funds at the beneficiary level CQC expects to eliminate the cause of corruption. Theft of metal stove parts has occurred in the past and CQC has since implemented secure storage and direct hand-off of stove parts to reduce this occurrence.

These practices to reduce illegal activities and identify other illegal activities were adhered to throughout the monitoring period.

2.3.7 Ongoing Conflicts or Disputes

There are no identified ongoing conflicts or disputes as the project scope does not involve rights to lands, territories, and resources. As the project implementation takes place within the private household, project activities would not interfere with the outcome of an unresolved dispute.

2.3.8 National and Local Laws and Regulations

CQC follows the Malawi Companies Act adhering to subsequent local and national laws. Project Implementors are registered with appropriate national authorities allowing them to conduct their operations, with CQC projects as an add-on. Relevant and applicable international and U.S. statutes and regulations are abided by.

These laws were adhered to during the monitoring period.

2.4 Grouped Projects

Compliance of new project activity instances with requirements of Grouped Project eligibility criteria is demonstrated below.

S.No.	Criterion	How the new project activity instances will comply	Demonstration of Compliance of present instances

1	Adopt and implement the project activities in the same manner as specified in the project description.	New project activity instances will be implemented in the same manner as described in the project description and will be implemented directly with beneficiaries of the TLCRS (TLC-CQC Rocket Stove), extending benefits and reinforcing project stove adoption	All stoves included in the current monitoring period are TLC-CQC rocket stoves implemented in domestic premises with due care to maximize adoption rates
2	Where appropriate, meet the applicability conditions of the SD VISta asset methodology applied to a project.	The project activity as well as the new project instances do not apply for SD VISta assets and hence this criterion is not applicable	Not Applicable.
3	Are subject to the same scenarios at project start with respect to stakeholders' well-being as determined for initial project instance(s), where (per Section 2.1.5.2 above) the project must meet the criteria of Section 3.1 above	New project activity instances will have the same baseline scenario, which was available during the start of project, i.e., usage of three-stone open fire cookstoves in the households. Also, the instances will be designed to maximize intended impact and preserve well-being, with monitoring and ongoing stakeholder consultations to ensure impact.	Each household that received the project stove, had been using three stone fire in the baseline. Provision of spot audits and surveys enabled the assessment of type and depth of impacts.
4	Are subject to the same scenarios at project start with respect to natural capital and ecosystem services as determined for initial project instance(s) where (per Section 2.1.5.2 above) projects must meet the criteria of Section 3.2 above.	New project instances will have the same scenario w.r.t natural capital and ecosystem services as determined in the baseline scenario. All the new instances will also have households relying on wood fuels for meeting their daily cooking energy demands.	All households that received project stove, revealed using wood fuel for cooking during the monitoring surveys.
5	Are subject to the same processes for stakeholder engagement	The new project activity instances will be detailed during continuous stakeholder consultations, refresher trainings for Implementing Partners and	The project proponent has ensured adequate training sessions, post implementation visits as

	described in the project description	feedback consider in secondary project activity design to maximize intended impact and preserve well-being.	well as surveys to maximize intended impacts.
6	Are subject to the same processes for respect for rights to lands, territories and resources – including free, prior and informed consent – described in Section 2.4 above.	The outlined Project Management (Section 2.3) will apply for each additional project activity	Project management for the current monitoring period is in compliance with the structure described in Section 2.3 of Project SD VISta Design document.
7	Are subject to similar monitoring elements to those set out in the project description	Additional projects will have equivalent monitoring plans and procedures as described in Section 3.3	The project has implemented the monitoring plan as detailed in section 4.3 of SD VISta DD.

3 BENEFITS FOR PEOPLE AND PROSPERITY

3.1 Impacts on Stakeholders

Impact #1	Ability to cook using TLCRS
Type of Impact	Positive, actual, direct
Affected Stakeholder Group(s)	Beneficiaries, beneficiaries' families
Resulting Change in Well-being	Decreased reliance on wood fuel, specifically from live trees, to meet equivalent thermal energy needs for cooking purposes and switching to abundant sources of woody biomass such as small branches and twigs from perennial shrubs, agroforestry, and crop residues. This results in a direct freeing up of time/money resources for other income-generating activities, health benefits due to reducing exposure to smoke in the home, increased food security due to nutrient retention with decreased cook time. Benefits to 174,022 households through the distribution of 348,043 TLCRS.

Impact #2	Promote sustainable and resilient agricultural practices
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Beneficiaries, beneficiaries' families
Resulting Change in Well-being	The distribution of 818 drip irrigation kits has not only enabled efficient irrigation management but will also have provided the households the opportunity to grow vegetables/crops even in dry season. Also, through the distribution of 175,000 bamboo seedlings as source of future renewable wood for cooking, the project activity seeks to create a sustainable chain of fuel wood supply to end users thereby reducing burden on forests.

Impact #3	Improved Health Status
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Beneficiaries, Beneficiaries' families, specifically children and infants under 5 years old
Resulting Change in Well-being	The amount of $PM_{2.5}$ emissions saved per 1 kg of fuel due to shift from baseline stove to project stove is 1.83 grams. Lowered risk of developing COPD or worsening COPD, less instance of acute lower respiratory illness, anticipated reduction of burns due to contained flames in the combustion chamber, improved overall respiratory health, increased ability to consume safe drinking water with reducing boiling water time. The mean-household percentage reporting health improvement due to project stove usage is 44, out of which 94% of the respondents have observed a reduction in the smoke and soot level in the cooking area and 50% of the respondents have reported a reduction in itching of eyes while cooking on project stoves. For 44% of households, the average reduction in $PM_{2.5}$ is 0.00241tons/annum.

Impact #4	Trainings imparted on climate change, project implementation and monitoring procedures
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Implementing Partner Staff, CQC Country Staff
Resulting Change in Well-being	Training and skill development related to community engagement, survey implementation, technical etc. will be provided to many stakeholder groups which is envisaged to empower their lives by not only improving their employment chances but also through increased awareness levels regarding issues related to climate change, social equity. A total of 5 individuals vocational training during the current monitoring period.

Impact #5	Reduction of time spent on unpaid domestic work
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Beneficiaries (most notably, female, elderly, and children, primarily girls)
Resulting Change in Well-being	Females who spend a copious amount of time on unpaid domestic labor, multiplied by the double/triple burden effect, have a predicted time saving which can be redirected to income-generating activities or relaxation time, contributing to enhanced conditions for gender equity. 63% of the households with women as primary collector have reported a reduction in time taken for collecting fuelwood. The total time saved in all households where women are primary fuel wood collectors, thereby reducing their drudgery, is 432957595 hours. The survey results revealed that all the respondents (60%) witnessed a decrease in cooking time, amount of firewood is required in the ICS and number of trips to carry the bundles of fuelwood due to decreased consumption.

Impact #6	Improved Economic status

Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Implementing partners, hired staff in project region
Resulting Change in Well-being	The employment opportunities will benefit the local population residing in and around the project area by improving their economic status. A total of 5 individuals were employed under the project activity for project implementation.

Impact #7	Industrialization and resilient infrastructure around the project area
Type of Impact	Positive, predicted, direct
Affected Stakeholder Group(s)	Local people around project area
Resulting Change in Well-being	The establishment of Ener-G-Africa will lead to development of resilient infrastructure and industrialization of the project area. Establishment of the manufacturing unit will not only generate employment opportunities for local people in and around the project area but also improve the socio-economic profile of local people in the region. Till date EGA has generated a revenue of 333,030.00 USD by distributing 55, 505 metal parts of the stove.

Impact #8	Reduced income of fuelwood vendors
Type of Impact	Negative, unpredicted, Indirect
Affected Stakeholder Group(s)	Local fuel wood vendors
Resulting Change in Well-being	There is a possibility that reduction in the demand of wood-fuel associated with usage of energy efficient ICS might affect the vendors selling fuel wood in Malawi. However, considering the proportion of reliance of Malawi population on fuelwood for cooking needs, decrease in the fuel-wood

	demand in project location is not likely to have a significant negative impact on wood vendors.

3.2 Stakeholder Impact Monitoring

The monitoring plan for the SD VISta project activity has been designed based on the requirements of allied VCS project activity – "Installation of high efficiency wood burning cookstoves in Malawi". An electronic database for the project activity is maintained by the PP. This database is also accessible to implementers and the verifying VVB.

The project database was populated during the distribution of appliances and is updated based on subsequent replacements. The database includes the following general information:

- Installation date of appliance
- Unique ID number of appliance
- Name of recipient
- Contact details of recipient
- Location of household (village, district and/or GPS coordinates)

It also includes the following information specific to technology deployed:

- Baseline cooking fuel
- Baseline stove type
- Usage of any other ICS prior to project activity

The survey questionnaire was designed to include both open-ended as well as close-ended questions to evaluate the end user's perception of the project stoves as well as to assess the quantum of benefits resulting from it.

Enumerators, coordinated by the PP, were trained on the basic concept of the programme and were introduced to the registration form as well as the survey questionnaire before being sent to the field. They were also made to fill sample questionnaires during the training process and problems faced during the test filling were shared and discussed to avoid similar problems in the actual survey.

Simple random sampling was used to select sample stoves. The sample size used during current monitoring period was same as the one determined for VCS project activity using the Standard: Sampling and surveys for CDM project activities and programme of activities. The level of precision was selected as 90/10. For this MP (MP 1 to MP 4) survey, 48 samples from the database were randomly selected. Outlined below are the results of the monitoring plan related to impacts identified in section 3.1.

<table>
<tr><th>S.No.</th><th>Stakeholder Group Impacted</th><th>Impact</th><th>SDG Indicator</th><th>Monitoring parameters</th><th>Monitoring Approach</th><th>Analysis</th></tr>
<tr><td>2</td><td>End User Household</td><td>Increased household ability to grow to grow crops/ vegetables in dry season</td><td>2.4</td><td>Monitor the number of households receiving drip irrigation kits under project activity</td><td>$N_{DIK,y} = N_{DIK,y}\,(1-DF)^{y-1}$
Where:<table><tr><td>$N_{DIK,y}$</td><td>Number of Drip Irrigation kits (DIK) operational in the project area, in turn representing promotion of sustainable agricultural practices in project scenario</td></tr><tr><td>y</td><td>Year of consideration</td></tr><tr><td>DF</td><td>Failure rate of drip irrigation kits. A default factor of 4% is considered for estimating the number of operational DIK estimated using field survey conducted at the start of project activity.</td></tr></table>Source: Drip Irrigation kits distribution records</td><td>$N_{DIK,y}$ = 818
y= 1
DF= 4%</td></tr>
<tr><td>3</td><td>End User Household</td><td>Sustainable supply of fuel wood for future</td><td>2.4</td><td>Monitor the total number of bamboo seedlings distributed</td><td>$N_{live\ plant} = N_{seedlings,year\ 1} \times 0.75$
Where:<table><tr><td>$N_{live\ plant}$</td><td>Total number of live bamboo plants[7]</td></tr><tr><td>$N_{seedlings,year\ 1}$</td><td>Total number of bamboo seedlings distributed at the start of project activity. A default mortality rate of 25% as available in published literature[8] has been used to</td></tr></table></td><td>$N_{seedlings,\ year1}$= 43750
$N_{live\ plant}$ = 32813</td></tr>
</table>

[7] The total number of bamboo seedlings that will survive post first year. The value is fixed for entire crediting period given the fact that the project will continue with the distribution activity at intervals throughout the project life to maintain a sustained supply of fuel wood for project stoves as well as ensure source of livelihood for the local women who could sell products made from bamboo.

[8] https://www.undp.org/malawi/stories/

					<table><tr><td></td><td>estimate the minimum number of plants that survive.</td></tr></table> Source: seedling purchase invoices.	
4	End User Household (Primary cook)	Reduced exposure to $PM_{2.5}$ emissions and household air pollution	3.9	Reduced $PM_{2.5}$ emissions	$Net\ Benefit = PM_{2.5\ baseline} - PM_{2.5\ project}$ *where* <table><tr><td>$PM_{2.5\ baseline}$</td><td>$PM_{2.5}$ emissions in baseline stoves (TSF) default of 52.699 mg/min (or 3.9 g/Kg fuel) Clean Cooking Catalog (cleancookstoves.org)</td></tr><tr><td>$PM_{2.5\ project}$</td><td>$PM_{2.5}$ emissions in project stoves.</td></tr></table> *Source:* Lab test report of Project stoves providing emission level of $PM_{2.5}$.	$PM_{(2.5\ baseline)}$= 3.9 grams per 1 kg of fuel used $PM_{2.5\ project}$= 2.07 grams per 1 kg of fuel used Net Benefit= $PM2.5_{\ baseline}$ - $PM2.5_{\ project}$ = 1.83 grams per 1 kg of fuel used
5	CQC staff	Skill set development and awareness generation	4.4	Number of individuals trained	$Net\ Benefit = Training_{\ project} - Training_{baseline}$ Where- <table><tr><td>$Training_{\ projec}$</td><td>Trainings provided in project scenario</td></tr><tr><td>$Training_{baselin}$</td><td>Trainings provided in baseline. A value of 0 shall be considered as in absence of project activity, these trainings would not have been undertaken by PP or PI.</td></tr></table> Source: Training Records Feedback forms	$Training_{\ project}$ = 5 $Training_{\ baseline}$ = 0 Net Benefit= $Training_{\ project}$ – $Training_{\ baseline}$ = 5

<table>
<tr>
<td>6</td>
<td>Women and young girls</td>
<td>Reduced drudgery</td>
<td>5.4</td>
<td>Proportion of users reporting time saving due to reduction in fuel collection amount and faster cooking on project stoves</td>
<td>$Net\ Benefit = T_{baseline} - T_{project}$
Where-
<table><tr><td>$T_{baseline}$</td><td>Average time spent in fuel collection and cooking in baseline scenario. Determined once prior to or concurrent with first verification. A fuelwood collection time of 2 hours/day/household determined from survey has been used as a baseline value.</td></tr><tr><td>$T_{project}$</td><td>Average time spent in fuelwood collection and cooking in project scenario</td></tr></table>Source: monitoring surveys conducted to determine average time saved in project scenario.</td>
<td>$T_{baseline}$ = 2 hours per day per household
$T_{project}$ = 0.4 hours per day per household

Net Benefit= $T_{baseline}$ -$T_{project}$
= 1.6 hours per day per household or 11.5 hours per week per household</td>
</tr>
<tr>
<td>7</td>
<td>End User Households</td>
<td>Affordable and clean energy</td>
<td>7.1</td>
<td>Monitor proportion of ICS distributed and operating under project as an indicator of clean technology</td>
<td>$Net\ Benefit = ICS_{project} \times N_y$
where
<table><tr><td>$ICS_{project}$</td><td>Number of ICS installed representing access to clean technology in project scenario</td></tr><tr><td>N_y</td><td>Proportion of operational stoves</td></tr></table>Source: ICS distribution records and ex-post monitoring surveys conducted to determine proportion of operational stoves</td>
<td>$ICS_{project}$ = 3,48,043
Ny = 100%

Net Benefit= $ICS_{project}$ X N_y
= 3,48,043</td>
</tr>
<tr>
<td>8</td>
<td>Implementation Partners and Survey Agencies</td>
<td>Employment generation</td>
<td>8.3</td>
<td>i. Number of local people employed for ICS distribution activities
ii. Number of local people employed for conducting impact survey.</td>
<td>$Net\ Benefit = ES_{project} - ES_{baseline}$
where
<table><tr><td>$ES_{project}$</td><td>Gainfully employed staff in project scenario.</td></tr><tr><td>$ES_{baseline}$</td><td>Gainfully employed staff in baseline. A value of 0 shall be considered as in absence of project activity no employment</td></tr></table></td>
<td>$ES_{project}$ = 5
$ES_{baseline}$ = 0

Net Benefit= $ES_{project}$ – $ES_{baseline}$
= 5</td>
</tr>
</table>

					<table><tr><td></td><td>opportunities would have been created.</td></tr></table> Source: employment records	
9	Local People (By improving the economic outcomes in Malawi)	Sustainable industrialization	9.2	Annual revenue of Ener-G-Africa that comes from CQC's stove part orders	$Net\ Benefit = N \times Cost_{metal\ parts}$ where <table><tr><td>N</td><td>Number of stoves for which the stove parts are procured from Ener-G Africa</td></tr><tr><td>$Cost_{metal\ part}$</td><td>Cost of metal parts of one stove</td></tr></table> Source: Sample Stove procurement invoices between CQC & Ener-G Africa	N= 55505 $Cost_{metalparts}$= 6 Net benefit = N x $Cost_{metal\ parts}$ = 333030

3.3 Net Positive Stakeholder Well-being Impacts

All the impacts identified in section 3.2 except for six, which is “Fewer wood vendors” generate a positive impact on the stakeholders. However, considering that ~91% of the rural population of Malawi rely on wood-fuel and there exists a significant demand-supply gap for fuel wood in the country, any reduction in demand for wood fuel within project boundary will shift the stakeholders selling wood to outside project boundary, without causing significant reduction in their business as there would still exist a considerable demand for the product. Even though impact on fuel sellers is an unintended negative impact because of the project activity, but based on the existing scenario in Malawi, it does not make considerable impact and outweighed by the positive impacts of the following combined, long-term sustainable development benefits observed for the project’s stakeholders:

1. Beneficiaries will have a greater capacity to save money used for buying wood fuel due to the reduced demand of fuel wood for cooking purposes

2. Beneficiaries receiving drip irrigation kits will be able to ensure efficient water management that will increase the household’s ability to grow crops/vegetables in dry season

3. Beneficiaries will have continued access to wood fuel due to the distribution of bamboo seedlings

4. Women and young girls will have to spend less time on hard menial, unpaid, and dull work of collecting wood fuel and household chores like cooking

5. Women and young girls can use the time saved from cooking and fuel wood collection in more productive activities which can generate income as well

6. Women and children will be exposed to lower levels of HAP, as ICS would reduce the amount of $PM_{2.5}$ emissions being released from cookstoves

7. Improved health status is expected to be achieved for all the household members due to reduced levels of HAP

8. Fewer children will be on a risk of experiencing burn injuries associated with open cooking fires

9. Local individuals will be trained and have better vocational skills enhancing their long-term employability and influencing their overall social and economic well-being

10. Local individuals around the project boundary will have access to increased employment opportunities through the creation of Ener-G Africa, the stove manufacturing industry in Malawi. This unit will not only contribute to developing resilient infrastructure and industrial development in the country, but also improve the overall socio-economic status of local communities in and around the project location.

4 BENEFITS FOR THE PLANET

4.1 Impacts on Natural Capital and Ecosystem Services

Impact #1	Reduced demand for large diameter non-renewable firewood from live trees due to only needing finger-sized woody biomass, i.e., twigs and crop residues, for cooking on the TLCRS
Type of Impact	Positive, actual, direct
Affected Natural Capital and/or Ecosystem Service(s)	Biodiversity and Specifies Richness, Soil and Water Conservation
Resulting Change in Condition	By slowing the consumption of woody biomass for cooking purposes and by eliminating the need for large diameter woody biomass due to the technology in the TLCRS, the resulting drop in demand slows deforestation, thus increasing the renewable energy share in the total final energy consumption of the project area. It is estimated that deforestation was reduced by ~2.73 tons of woody biomass per stove during the monitoring period.

Impact #2	Avoided emission of GHGs made possible by using TLCRS
Type of Impact	Positive, predicted, indirect
Affected Natural Capital and/or Ecosystem Service(s)	Air quality in the households as well as surroundings
Resulting Change in Condition	The project stoves require less fuelwood for producing the same amount of thermal energy, therefore, resulting in less carbon dioxide emission in the atmosphere. As carbon dioxide is a greenhouse gas, its reduced emission translates to a positive impact on climate change. It is estimated that emission reduction for the current monitoring period is 1,787,030 tCO_2 e.

4.2 Natural Capital and Ecosystem Services Impact Monitoring

During the first monitoring period, the value of $B_{y,saving,i,j}$ is ~2.73 tonnes, whereas the $ER_{y,i,jis}$ 1,787,030 tCO_2 e.

4.3 Net Positive Natural Capital and Ecosystem Services Impacts

By distributing 21964 TLCRS stoves and replacing the usage of three-stone fire and other traditionally used fuel-inefficient cook stoves, during the first monitoring period, the primary project activity, installation of the TLCRS generated an approximate calculation of 1,787,030 tCO2e GHG emission reductions, and savings of ~2.71 tonnes of wood biomass.

APPENDIX

References

Appendix A: List of Abbreviations

References

1. Clean Cooking Alliance (n.d). Delivering on the Sustainable Development Goals through Clean Cooking. https://www.cleancookingalliance.org/feature/delivering-on-the-sustainable-development-goals-through-clean-cooking.html,

2. Amegah, A.K., 2020. Improving Child Survival in Sub-Saharan Africa: Key Environmental and Nutritional Interventions. Annals of Global Health, 86(1).

Appendix A: List of Abbreviations

COPD: Chronic Obstructive Pulmonary Disease

EGA: Ener-G-Africa

GP: Grouped Project

GVH: Group Village Headperson

HAP: Household Air Pollution

HP: Health Promotors

ICS: Improved Cookstoves

LSC: Local Stakeholder Consultation

PM2.5: Particulate Matter SC: Stove Champions

SDG: Sustainable Development Goals

TA: Traditional Authority

TLCRS: TLC Rocket Stoves

TSF: Three-stone fire stove

VCS: Voluntary Carbon Standard