May 2018

Myanmar Stoves Campaign

GOLD STANDARD MONITORING REPORT

GS Reference Number: GS 1729 (PoA) & GS 5662 (VPA 006)
Monitoring Periods: 01/05/2016 - 30/04/2017
1st Verification - 1st Periodic Verification of the 1st Crediting Period of 2016-17
Net Emission Reductions: For (2016-17) = 9056 tCO_2

From	To	VERs
01st May 2016	31st December 2016	6037
01st Jan 2017	30th April 2017	3019
Total		9056

Version: 1.0 Submitted on: 01st May 2018
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Contents

Section A: General Description of Myanmar Stoves Campaign

A.1] Project Introduction, Participants and Technology Used

Myanmar Stoves Campaign aims to ensure the use of carbon finance to support the distribution and maintenance of domestic and non-domestic Fuel-Efficient Stoves (FES) through local implementation partner(s) (IP) in the Republic of the Union of Myanmar.

The Myanmar Stoves Campaign is a programme of the Soneva Foundation and the first Gold Standard certified carbon project in Myanmar. This project activity is implemented by three actors, which are the Soneva Foundation, Mercy Corps and Local Vendors (Sales Agents) in each of the targeted project villages under this VPA.

Myanmar Stoves Campaign was started in September 2013 and currently, and since then, as of May 2018, the project has covered more than 1000 villages in Mandalay Region in central part of Myanmar. The co-ordinated action by the three actors in this project has been successful in distributing over 20,000 fuel efficient stoves which have improved the lives of more than 100,000 people.

The stoves distributed are the Envirofit SuperSaver GL (Earlier known as M-5000). Each household received at least one stove. There are two methods of payments which are lump sum (15000 MMK for lump sum payment) and instalment (17000 MMK for five (5) months instalment) payments. Instalment is an excellent method for some families who have financial hardship and couldn't afford lump sum payment.

Selected FES model for this VPA:

- Envirofit SuperSaver GL (Earlier known as M-5000), launched in 2011, is the successor model of the G-3300 and is produced in China, India and Kenya

- Product weight 4.2kg
- Size (in cm): 28x26.5x26.5
- CO2 emission reduction compared to three stone fire of 66%
- Wood use reduction compared to three stone fire of 66%
- Thermal efficiency of 29.7%
- Manufacturer guarantee of 2 years on outside and 5 years on the inside parts
- Estimated product life of 5 years

Source: M5000 (SuperSaver GL) Performance Sheet (Link) and manufacturer website (Link)

Envirofit SuperSaver GL had been selected as suitable product for local users based on the inputs from local communities and various stakeholders after they were consulted through demonstration and filed tests. This followed with the stoves being distributed to the households in targeted villages.

This intervention has helped the local households to smoothly transition to a new FES stove from being dependent on the old three stone fires. The user experience and benefits has been very positive and encouraging towards this modern technology. In addition to this, this project has successfully demonstrated the contribution in catalysing the socio-economic development of these communities by having a positive impact on a range of indicators. There is an increasing awareness among the users in targeted villages and the nearby ones on the immediate and long term environmental and economic benefits coming from this project, which is helping in higher rates of adoption, all of which is helping the Myanmar Stoves Campaign to positively impact the lives of the rural under-served in a sustainable and environmentally friendly way.

A.2] Relevant Dates for the Project Activity

Date of first stove sale & start date of the project activity = 01st May 2016 (to 28th Feb 2017)

Start date of crediting period = 01st May 2016

First project monitoring exercise performed on: 16th March to 23rd March 2018, results to be applied to the crediting periods from:

01/05/2016 - 30/04/2017 – Retroactive Crediting Year 1

A.3] Methodology Applied

GS1729 "Myanmar Stoves Campaign" Gold Standard micro-scale PoA applies the "Simplified micro-scale cookstove methodology" by Gold Standard Foundation.

The relevant equations are as follows:

$$ER_y = \sum_{0to1}^{XtoY} N_{p,y} * P_y * U_{p,y} * \mathrm{f}_{\mathrm{NRB,\,y}} * (\mathrm{EF}_{\mathrm{b,fuel,CO2}} + \mathrm{EF}_{\mathrm{b,fuel,\,non\_CO2}}) * (1 - \mathrm{DF}_{\mathrm{b,Stove,y}})$$

$$P_y = B_{b,y} * (1 - \frac{\eta_b}{\eta_{p,y}})$$

$$\eta_{p,y} = \eta_p * (DF_\eta)^{y-1} * 0.94$$

Where:

$N_{P,y}$	Number of project cookstoves of each age group operational in the year y
P_y	Quantity of firewood that is saved in the year y (tonnes per household in year y)
$U_{P,y}$	Usage rate for project cookstoves in year y, based on adoption rate and drop off rate revealed by usage surveys (fraction)
$f_{NRB,b,y}$	Fraction of biomass, used in year y for baseline scenario, which can be established as non-renewable. The project proponents shall estimate project specific national/ regional value[4] or apply the default f_{NRB} value provided by the CDM Executive Board and endorsed by the host country DNA[5].
$EF_{b,fuel,CO2}$	CO_2 emission factor of firewood that is substituted or reduced. (Default value for wood fuel 1.747 tCO_2/ton of wood)
$EF_{b,fuel,non\_CO2}$	Non-CO_2 emission factor of firewood that is substituted or reduced. (Default value for wood fuel 0.455 tCO_2/ton of wood)
$DF_{b,Stove,y}$	Usage of baseline cookstove during the year y (fraction) in project scenario
x	y – 1
y	Year of the crediting period

Determination of quantity of biomass saved:

Quantity of firewood that is saved ($P_{,y}$) is estimated as follows:

$$P_y = B_{b,y} * (1-\eta_b/\eta_{p,y}) \quad \ldots\ldots(2)$$

Where:

$B_{b,y}$	Quantity of firewood consumed in baseline scenario during year y (tonnes per household per year)
$\eta_{p,y}$	Efficiency of project cookstove in year y (fraction)
η_b	Efficiency of the baseline cookstove being replaced (fraction). A default value of 10% shall be used if the replaced cookstove is a three stone fire, or a conventional device without a grate or a chimney i.e. with no improved combustion air supply or flue gas ventilation

Determination of firewood consumed in baseline ($B_{b,y}$)

The firewood consumed in baseline ($B_{b,y}$) for this VPA is calculated through the baseline survey conducted as per the guidelines in The Gold Standard Simplified Methodology for Efficient Cookstoves, Version 01, February 2013 by Gold Standard Foundation. The survey shows an Annual Baseline Wood Consumption/Household to be 3.94 Metric Tons.

Section B: Description of Monitoring System & Exercise for VPA 006

B.1] Monitoring System

The monitoring plan is in accordance with " The Gold Standard Simplified Methodology for Efficient Cookstoves, Version 01, February 2013."

The monitoring methodology is supported by:

- Sales receipts
- Total Sales Record (Project Tracking File)
- Customer Database
- Project Database, which is maintained continuously

Maintenance of a Total Sales Record

The Project Proponent collates and maintains the total sales data in electronic and paper format. The Total Sales Record will comprise the following data:

- Date of Sale[1]
- Model/type of project technology sold:
- Serial/ID number of the device
- Name and telephone number (if available) of end-users
- Application of device (type of end use: Commercial/Domestic)
- Address/ Location of end-users[2]

The **Sales Record** information is collected using the following methods:

For the portable fuel-efficient stoves, the local vendors (sales agents) sell stoves directly to end-users and record sales and user training continuously. This data is then collated into a detailed Total Sales Record that tracks the chain of transactions between the user and the distributors.

[1] Date of Sale will be associated with conservative assessment as to date of installation and commencement of use of technology
[2] In circumstances where a user's formal address cannot be provided due to insufficient information on street names/house numbers, suitable landmarks/ with location on a town/city plan will be provided.

The data received by the project implementation partners in paper format will be converted and saved electronically for monitoring and analysis purposes. A mechanism, designed jointly between the CME and the implementing partner, is agreed and put in place to accurately track sales, inventories, supply and purchases for every stove distributed. For assuring accuracy and consistency, the Total Sales Record will be cross checked with import data, usage and other relevant data.

The names and telephone numbers or name and addresses collected must be commensurate with representative sampling, i.e. the names and addresses or phone numbers (where possible) within sales record shall be large enough so that surveys can be based on representative, randomly selected samples.

Project Database

The project database is derived from the Total Sales Record with project cookstoves differentiated by different project scenarios. The differentiation of the project database into sections is based on the results of the applicable monitoring studies for each project scenario, in order that emission reduction calculations can be conducted appropriately section by section.

Other periodic monitoring tasks

Monitoring shall consist of checking of a representative sample, once every year (annually) to ensure that project cookstoves are still operating by carrying out the usage survey as per the guidelines set out in the methodology.

Annual surveys for monitoring:

- **Usage Survey** to establish the drop-off rates in technology usage from year-1 sales and other vintages. For example, if only cookstoves in the first year of use (age0-1) are being credited, a usage parameter must be established for age-group 0-1, through a usage survey for cookstove age0-1. If cookstoves of age 0-1 and age 1-2 are being credited (as part of first request for issuance), usage parameters must be established for age-group 0-1 and 1-2, respectively through a usage survey. If cookstoves of age-group 0-1 and 1-2 are being credited (as part of second request for issuance), usage parameters must be established for age-group 1-2 only through a usage survey as the usage rate for cookstoves of age group 0-1 can be applied from the previous issuance.

- **Monitoring Survey** to reassess household kitchen regimes. CME and/or Implementation Partner will randomly sample households from the sales agreements received. Sampling will be representative of geographic regions and technology used.

Where replacements are made, monitoring shall also ensure that the efficiency of the new cookstove is similar to the appliances being replaced.

The project must also monitor the use of baseline stoves in the project activity and any seasonal variation.

Finally, the project must also monitor the physical conditions of the cookstoves.

B.2] Monitoring Exercise for VPA 006

The project monitoring survey for this VPA, was conducted from 16th March to 23rd March 2018.

During this period, 110 household face to face surveys were conducted in a total of 10 villages under this VPA. These villages are Tha Man Kan (S), Ma Gyi Kine, Ta Lin Gyi, Kin Bag, Shwe Totel Kone, Myaing Thar, Nga Zin Yine, Taung Kine, Sapar Twin, Hta Naung Kine Kone.

The survey was designed to collect key information on the monitoring parameters for carbon emission reduction calculations and sustainability development indicators. The list of people interviewed is provided at the end of this document in Annex 2.

The team involved in the project monitoring exercise is as follows:

Name	Designation & Role	Qualification
Bhushan Trivedi	Consultant to the Soneva Foundation on Myanmar Stoves Campaign. Bhushan led the designing of the project monitoring survey exercise + QA/QC of data.	Bhushan Trivedi is a consultant in the field of social development and social entrepreneurship. He has an extensive experience of working in the development sector in India and Myanmar, specifically on energy access initiatives. Apart from being a consultant to the Soneva Foundation on Myanmar Stoves Campaign for four years, he also led a solar PV micro-grid project in rural Myanmar. Bhushan has earned his bachelor's degree in Mechanical Engineering from Pune University, India. A Masters in Environmental Assessment & Management from Salford Univerity, Manchester, UK, and a Diploma in Social Entrepreneurship from NMIMS, Mumbai.
Phyo Phyo Wai	Senior Program Manager, Energy Venture Program for Mercy Corps (Myanmar) Phyo Phyo planned the data collection, training of enumerators, supervision and QA/QC of data.	Phyo is Senior Program Manager managing Energy Social Venture Program for Mercy Corps (Myanmar). She has extensive experiences in Development sectors, especially in Resilience sector; Disaster Risk Reduction, Climate Change and Civil Society Strengthening Sector. Phyo received a Bachelor Degree, majoring in Chemistry from University of Distance Education, Yangon, Myanmar. She also received Master in Development Studies (M.Dev.S) from the Institute of Economics, Yangon and Master in Development Management (MDM) from the Asian Institute of Management (AIM), Philippine. She has also obtained the Post-Graduate Diploma in Social Work from Yangon Art & Science University, Myanmar and Diploma in Teaching English for Speaker of Other Language from London Teacher Training College, UK.
U Hla Khaing	Enumerator	U Hla Khaing is a Myanmar national having significant experience in data collection process with Mercy Corps an

	Data Collection	other organizations. Moreover, he performed as one of the members of Village Development Committee in LIFT Project implemented by Mercy Corps since in 2010.
U Nyeing Maung	Enumerator Data Collection	U Nyeing Maung is a Myanmar national and also one of the members of Village Development Committee in LIFT Project implemented by Mercy Corps in 2010, having relevant experience in data collection relating to community development projects. He is currently living in Tel Lay Pin village, Tel Lay Pin Village Tract, Pyawbwe Township, Mandalay Division.

Age Groups

The project activity initially installed stoves into 1821 households.

This VPA claims ERs for the $age_{0\text{-}1}$ and has collected information to estimate the drop rates/usage rates of the cookstoves in these project regions.

From the $age_{0\text{-}1}$ results, the usage rate found out was 99% which means there are currently 1803 stoves currently in use.

Monitoring Procedure Followed

Soneva Foundation led the design of the monitoring exercise while ensuring the quality assurance/check mechanisms with the same. The monitoring plan was then shared and discussed with the project implementation partners, Mercy Corps, who interviewed, selected and trained a team of enumerators for data collection. The data collection was via a survey designed in line with the Project Survey format, Annex A in the Simplified Methodology for Efficient Cookstoves. These 110 surveys were conducted at each of the randomly selected households from the $age_{0\text{-}1}$ group.

The data collected converted into the electronic format and shared with the Soneva Foundation, the CME of this project.

QA/QC Measures

Soneva Foundation is responsible for ensuring data quality. The data used in this report is sourced from the project monitoring survey (conducted in March 2018), and the user database + project tracking file which are updated regularly. Cross checking of the stove user name and respective serial numbers were done in two stages, first by the team at Mercy Corps and followed by Soneva Foundation.

B.3] Parameters monitored according to the monitoring plan

Parameters and data fixed ex-ante

The following data and parameters are fixed ex-ante and do not need to be monitored over the crediting period:

Data / Parameter:	**$EF_{b, fuel, CO2}$**
Data unit:	tCO2/t firewood
Description:	CO2 emission factor arising from the use of firewood in baseline scenario
Source of data used:	IPCC default values, table 1.4 of chapter 1 of Vol. 2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	1.747
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by GS VER Methodology
Any comment:	Measuring emission factors from stove technologies is costly and difficult to do accurately. The CME applies default IPCC emission values.

Data / Parameter:	**$EF_{b, fuel, non\_CO2}$**
Data unit:	tCO2/t firewood
Description:	Non-CO2 emission factor for use of firewood in baseline scenario
Source of data used:	IPCC default value, table 2.9 of chapter 2 of Vol. 2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	0.455
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by GS VER Methodology
Any comment:	Measuring emission factors from stove technologies is costly and difficult to do accurately. The CME applies default IPCC emission values.

Data / Parameter:	η_b
Data unit:	Fraction
Description:	Efficiency of the baseline system being replaced
Source of data used:	Methodology
Value applied:	10%
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value as per the GS methodology.
Any comment:	Measuring emission factors from stove technologies is costly and difficult to do accurately. The CME applies default IPCC emission values.

Data / Parameter:	η_p
Data unit:	Percent
Description:	Efficiency of the cookstove i being used in the project scenario
Source of data used:	Emissions and Performance Report (Colorado State University)
Value applied:	29.7%
Justification of the choice of data or description of measurement methods and procedures actually applied:	The efficiency of the project cookstove needs to be determined by an independent expert or entity, in the field or laboratory, following the Water Boling Test protocol (available at http://www.pciaonline.org/node/1048). The CME may assess the project cookstove efficiency at the time of installation and use the default factor (eq.3) to derive efficiency in the year y. OR, the project cookstove efficiency ($\eta_{p,y}$) may be determined annually following the WBT protocol. In such a case the project cookstove efficiency shall not be adjusted by the default factor for efficiency loss during the year of operation. The term "DF_η" shall be omitted and "η_p" shall be replaced. The average project cookstove efficiency will be determined using WBT in year y to calculate the $\eta_{p,y}$, efficiency of project cookstove in year y.
Any comment:	No extra Water Boiling Test in Myanmar is required as long as the project stove has been independently tested and is widely used in different countries. Source: Envirofit Data (http://envirofit.org/product/cookstoves/supersaver-gl-wood/)

Data / Parameter:	$f_{NRB, y}$
Data unit:	Fraction
Description:	Default values of fraction of non-renewable biomass for least developed countries and small island developing states
Source of data used:	CDM EB67 Report Annex 22 (Weblink) Endorsed by Myanmar DNA
Value applied:	0.95
Justification of the choice of data or description of measurement methods and procedures actually applied:	The default NRB approved by CDM EB will be applied to all VPAs. If this value is updated by the EB or rejected by the Myanmar DNA, then each VPA using this value will be updated either at VPA inclusion or verification. A VPA-specific NRB assessment may be provided as an alternative within a VPA-DD.
Any comment:	Endorsement letter provided during PoA/VPA 001 validation phase

Data / Parameter:	$B_{b,y}$
Data unit:	t/hh/a (tons firewood per household per annum)
Description:	Quantity of firewood consumed for cooking in baseline scenario during year y
Source of data used:	Baseline survey report
Value applied:	3.94
Justification of the choice of data or description of measurement methods and procedures actually applied:	Value derived from ex-ante baseline surveys. As per the methodology, the baseline may be reassessed post-registration, in time for verification if survey reveals significant changes over time. Estimates for average annual fuel use will be derived from the project survey. Alternatively, the default value suggested by the GS methodology (0.5 tons/capita/year) may be used instead.
Any comment:	All data sources are transparent and verifiable. Refer to baseline survey report for details, submitted separately in supporting documents with this report

Data / Parameter:	$LE_{p,i,y}$
Data unit:	fraction
Description:	Leakage in project scenario p, for technology i, during year y
Source of data to be	Default value

used:	
Value applied:	0.95
Justification:	Deemed valid per the GS methodology.
Any comment:	Aggregate leakage can be assessed for multiple project scenarios, if appropriate.

Parameters and data fixed ex-ante – with latest values from 2018 Survey

The following data and parameters are established as part of the project survey and are monitored over the crediting period. the tables show the latest values derived from project monitoring survey conducted in March 2018.

Data / Parameter:	**$U_{p,y}$**
Data unit:	Percentage
Description:	Usage rate for project cookstove in year y, based on adoption rate and drop off rate as per usage surveys
Source of data:	Project monitoring survey conducted during March 2018
Value applied:	99% value applied for 2016-17
Monitoring frequency:	Annually as established in the VPA-DD
QA/QC procedures to be applied:	A representative sample of project cookstove end-users was selected for follow-up by the monitoring and evaluation team. End user surveys were done house to house and status/information on all monitoring parameters was gathered.
Any comment:	A usage parameter is derived for each age group of project cookstove being credited.

Data / Parameter:	**$N_{p,y}$**
Data unit:	Number of project cookstoves credited (units)
Description:	Cookstove in the project database for project scenario p through year y
Source of data:	Total Sales Record (VPA 006 (GS 5662) - Project Tracking File)
Value applied:	1821
Monitoring frequency:	Continuous
QA/QC procedures to be applied:	Transparent data analysis and reporting
Any comment:	

Data / Parameter:	**DF_n**
Data unit:	Fraction

Description:	Discount factor to account for efficiency loss n of project cookstoves
Source of data:	Fixed default value from the methodology.
Value applied:	0.99 i.e., 1% efficiency loss per year. For period 2016-17 = 0.94
Monitoring frequency:	Annual
QA/QC procedures to be applied:	Transparent data analysis and reporting
Any comment:	This default will be used if stoves are found in good condition during annual surveys. For each year, the stoves of the age group x-y should be physically verified. In the case of progressive installations, stove of age group 0-1 shall also be physically verified each year through a random sampling approach. Minimum number of sample size shall be selected following the guidelines provided in section 4.2, option (b) of the methodology.

Data / Parameter:	**$DF_{p, Stove, y}$**
Data unit:	Fraction
Description:	Discount factor to account for usage of baseline cookstove during the year y in project scenario p
Source of data:	Project monitoring survey conducted during March 2018
Value applied:	0.0038 %
Monitoring frequency:	Annual
QA/QC procedures to be applied:	Transparent data analysis and reporting
Any comment:	The discount factor for baseline-stove use may be determined based on number of meals cooked using the baseline stove. The required information shall be captured through sample surveys carried out following a random sampling approach for each age-group of the project stove. The minimum number of sample sizes shall be selected following the guidelines provided in section 4.2, option (b) of the POA-DD. The impact of seasonal variation on the use of baseline stove should be considered as part of the monitoring survey.

Results on Sustainability Development Indicators - with latest values from 2018 Survey

No		1
Indicator		Air Quality
Mitigation measure		Not Required
Repeat for each parameter		*N/A*
Chosen parameter		Visible improvement in the indoor air quality by reduction of smoke, and sub-sequent indoor air pollution, irritation to eyes, soot emitting out and depositing on the walls of houses.
Current situation of parameter		**100 %** Unanimous agreement from the current stove users that the project stove has significantly improved the indoor air quality as compared to the earlier baseline stove. Source: VPA 006 Project Monitoring Survey in March 2018
Estimation of baseline situation of parameter		Elevated levels of smoke coming out from stove usage, irritation to eyes, respiratory difficulties and higher deposition of soot on the walls of the kitchen area/house.
Future target for parameter		Maintain and improve the indoor air quality.
Way of monitoring	How	Household Surveys, Focus Group Discussions & Interviews
	When	Annually – after stoves are distributed
	By who	Self-Assessment by CME or Independent Auditor

No	2
Indicator	Livelihoods of the Poor
Mitigation measure	Not Required
Repeat for each parameter	*N/A*
Chosen parameter	Money and time spent in purchasing/collecting firewood
Current situation of parameter	**Time Savings for Households = 34% (68 mins/month)** According to the project monitoring survey results, around 63% of

		the stove users have a practice of collecting firewood and have reported to save an average of 34% time (avg. of 68 mins/month) in the activity. Around 37% of the stove users currently purchase wood. Even for the current users who have started purchasing wood recently, the project stove saves significant amount of money as compared to the baseline three-stone stove. Source: VPA 006 Project Monitoring Survey in March 2018
Estimation of baseline situation of parameter		Households earlier spent more time to collect firewood before using the new stoves.
Future target for parameter		Increase the time and money savings for users
Way of monitoring	How	Household Surveys, Focus Group Discussions & Interviews
	When	Annually – after stoves are distributed
	By who	Self-Assessment by CME or Independent Auditor

No	3
Indicator	Access to Affordable and Clean Energy
Mitigation measure	Not Required
Repeat for each parameter	*N/A*
Chosen parameter	Access and satisfaction with project stove
Current situation of parameter	The project initially installed stoves into 1821 households. Applying the latest usage rate of 99% this results in 1803 stoves currently in use. From the baseline survey, we know that households have on average 5.61 members. Thus, the project currently provides clean and efficient cooking stoves for 10113 people. There has been high levels of user satisfactions with the project stove, savings in fuel are evident. Stove users are satisfied with the small portable design of stove which can be easily carried around anywhere.
Estimation of baseline situation of parameter	Three stove fires were easily accessible but are stationary, emit more heat on the user, consume more wood and does not provide with a healthy and comfortable environment for the user. None of the users had any form of better and efficient cooking technology.
Future target for parameter	Increase the outreach and number of stoves distributed. Maintain

		and increase the level of user satisfactions.
Way of monitoring	How	Household Surveys, Focus Group Discussions & Interviews
	When	Annually – after stoves are distributed
	By who	Self-Assessment by CME or Independent Auditor

No		4
Indicator		Human & Institutional Capacity
Mitigation measure		Not Required
Repeat for each parameter		*N/A*
Chosen parameter		Number of households participated in environmental awareness raising campaigns and sessions.
Current situation of parameter		From the start of this VPA on 01st May 2016 to 28th February 2017, the results of Human & Institutional Capacity are as follows: Total Awareness Raising Events = 69 Total Participants = 2320 Total Male Participation = 1030 out of 2320 (45%) Total Female Participation = 1290 out of 2320 (55%) Source: VPA 006 (GS 5662) - Project Tracking File, submitted as a supporting document
Estimation of baseline situation of parameter		None of such campaigns and/or sessions were organized.
Future target for parameter		Increase the number of household and women participation
Way of monitoring	How	Household Surveys, Focus Group Discussions & Interviews
	When	Annually – after stoves are distributed
	By who	Self-Assessment by CME or Independent Auditor

No		5
Indicator		Quantitative Employment & Income Generation
Mitigation measure		Not Required
Repeat for each parameter		*N/A*
Chosen parameter		Number of local Sales Agents jobs created and increase in income & social recognition.
Current situation of parameter		From the start of this VPA on 01st May 2016 to 28th February 2017, the results on Quantitative Employment & Income Generation are as follows: Total Number of Sales Agents (Vendors) Trained = 67 Total Female Sales Agents (Vendors) Trained = 42 Total Male Sales Agents (Vendors) Trained = 25 These local sales agents in this VPA from all the villages, and significant increase in their social recognition and some assistance through financial incentives. The average earnings made by the sale agents is 90,925 MMK. Source VPA 006 (GS 5662) - Project Tracking File, submitted as a supporting document.
Estimation of baseline situation of parameter		These jobs did not exist prior to this project
Future target for parameter		Increase more local vendors with more focus on women
Way of monitoring	How	Household Surveys, Focus Group Discussions & Interviews
	When	Annually – after stoves are distributed
	By who	Self-Assessment by CME or Independent Auditor

Section C: Emission Reduction Calculations

Actual Emission Reduction Values Post Conducting the Monitoring Study

The table below summarizes the values for key emission reduction calculation parameters, measured in project monitoring survey, default values from methodology, and from other sources used for calculations for the crediting period. Ie., 2016-17. Please refer the "VPA 006 (GS 5662) - Ex-Post Emission Reductions Sheet" for 2016-17, as a supporting document for detailed calculations.

Parameter	Description	Crediting Period 2016-17	Unit	Source
$N_{p,y}$	Number of project cookstoves of each age group operation in year y	1821		VPA 006 (GS 5662) - Project Tracking File
$U_{p,y}$	Usage rate for project cookstove in year y, based on adoption rate and drop off rate	99	%	Project monitoring survey conducted during March 2018
$B_{b,y}$	Quantity of firewood consumed in baseline scenario during year y	3.94	Tons/ household/ year	Baseline Survey Report
η_b	Efficiency of the baseline system being replaced	10	%	Default Value from Methodology
$\eta_{p,y}$	Efficiency of the system being deployed as part of the project activity	27.92	%	After applying discount factor to original efficiency (29.7%) to account for efficiency loss of project cookstove per year of operation
P_y	Quantity of firewood that is saved in the year y	2.53	Tons/ household/ year	Calculated as per Methodology
DFη	Discount factor to account for efficiency loss of project cookstove per year of	0.94	Factor	Calculated as per Methodology
$f_{NRB,\ y}$	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass	0.95	Fraction	CDM EB67 Report Annex 22 (Weblink) + Endorsement Letter Provided

				during PoA registration
$EF_{b, fuel, CO2}$	CO_2 emission factor of firewood that is substituted or reduced	1.747	tCO_2/ tWood	Default Value from Methodology
$EF_{b, fuel, non CO2}$	Non-CO2 emission factor of firewood that is substituted or reduced	0.455	tCO_2/ tWood	Default Value from Methodology
$DF_{b, Stove, y}$	Usage of baseline cookstove during the year y in project scenario	0.0038	%	Project monitoring survey conducted during March 2018
	Emission reductions of the project activity in period y (pre-leakage)	**9532**	**tCO_2**	Calculated as per Methodology
	Leakage Discount Factor	**0.95**		
ER_y	**Emission reductions of the project activity in period y**	**9056**		Calculated as per Methodology
Total ER for 2016-17			**tCO_2**	

Year Wise ER breakup

From	To	VERs
01st May 2016	31st December 2016	6037
01st Jan 2017	30th April 2017	3019
Total		9056

Estimated ER Values Before Conducting the Monitoring Study

Year	Estimation of project activity emission (tCO_2)	Estimation of baseline emissions (tCO_2)	Estimation of leakage (Discount Factor = 0.95)	Estimation of overall emission reductions (tCO_2)
01/05/2016 to 28/02/2017	0	10133.7	0.95	9627
01/05/2017 to 28/02/2018	0	10075.8	0.95	9572
01/05/2018 to 28/02/2019	0	10017.9	0.95	9517
01/05/2019 to 28/02/2020	0	9960.0	0.95	9462
01/05/2020 to 28/02/2021	0	9901.1	0.95	9406
Total (tCO_2)	0	50088.5		47584

The difference between the estimated value for emission reductions Vs the actual values are summarized in the table below:

	Estimated VER	Actual VER
2016-17 (age_{0-1})	9627	9056

The difference between the estimated VER and actual VER values is majorly because of low usage rate (99% Vs 100% in estimated), and the application of leakage discount factor (0.95)

Annex 1 - List & Name of Supporting Documents

1) VPA 006 (GS 5662) - Baseline Survey Report

2) VPA 006 (GS 5662) - Project Tracking File

3) VPA 006 (GS 5662) - End User Database

4) VPA 006 (GS 5662) – Project Monitoring Survey Results

5) VPA 006 (GS 5662) - Ex Post Emission Reductions Sheet

6) VPA 006 (GS 5662) - Monitoring Survey Scans

Annex 2 - List of Households Surveyed

Survey No	Stove Serial Number	Household Owner Name	Village Name	Date of Purchase of FES	Date of Survey
1	EM1G-065513	U Thein Myint	Tha Man Kan (S)	13-05-2016	16-03-2018
2	EM1G-065530	U Tin Myint	Tha Man Kan (S)	13-05-2016	16-03-2018
3	EM1G-065352	U Kyaw Thu	Tha Man Kan (S)	22-05-2016	16-03-2018
4	EM1G-065524	Daw Khin Mar	Tha Man Kan (S)	13-05-2016	16-03-2018
5	EM1G-065528	U Zaw Min Aye	Tha Man Kan (S)	07-08-2016	16-03-2018
6	EM1G-067992	U Paw San	Tha Man Kan (S)	13-06-2016	16-03-2018
7	EM1G-066457	U Win Maung	Tha Man Kan (S)	01-06-2016	16-03-2018

8	EM1G-065563	Daw Nyo	Tha Man Kan (S)	25-05-2016	16-03-2018
9	EM1G-065292	U Kyaw Aung	Tha Man Kan (S)	13-05-2016	16-03-2018
10	EM1G-074985	U Thaung Myint	Ma Gyi Kine	22-02-2017	21-03-2018
11	EM1G-074530	U Myo Thu	Ma Gyi Kine	22-02-2017	21-03-2018
12	EM1G-076139	U Htein Win	Ma Gyi Kine	22-02-2017	21-03-2018
13	EM1G-074631	U Min Aung	Ma Gyi Kine	22-02-2017	21-03-2018
14	EM1G-076185	U Khing Soe	Ma Gyi Kine	22-02-2017	21-03-2018
15	EM1G-076316	U Aye Wun	Ma Gyi Kine	22-02-2017	21-03-2018
16	EM1G-076156	U Than Naing Lin	Ma Gyi Kine	22-02-2017	21-03-2018
17	EM1G-074862	U Than Tun	Ma Gyi Kine	22-02-2017	21-03-2018
18	EM1G-076073	U Ye Tun	Ma Gyi Kine	22-02-2017	21-03-2018
19	EM1G-074854	U Zaw Myo Win	Ma Gyi Kine	22-02-2017	21-03-2018
20	EM1G-076086	Daw Thae	Ma Gyi Kine	22-02-2017	21-03-2018
21	EM1G-076121	Daw Tin New	Ma Gyi Kine	22-02-2017	21-03-2018
22	EM1G-075997	U Theit Soe	Ta Lin Gyi	23-02-2017	23-03-2018
23	EM1G-076052	U Toe	Ta Lin Gyi	23-02-2017	23-03-2018
24	EM1G-074736	Daw New	Ta Lin Gyi	24-02-2017	23-03-2018
25	EM1G-074076	Daw Soe Soe Aye	Ta Lin Gyi	23-02-2017	23-03-2018
26	EM1G-076092	Daw A Mar	Ta Lin Gyi	23-02-2017	23-03-2018

27	EM1G-076265	U Thein Soe	Ta Lin Gyi	23-02-2017	23-03-2018
28	EM1G-075360	U Naing Moe	Ta Lin Gyi	24-02-2017	23-03-2018
29	EM1G-075934	Ma Thale Thale Win	Ta Lin Gyi	24-02-2017	23-03-2018
30	EM1G-075049	Ma Myoe Thandar	Ta Lin Gyi	23-02-2017	23-03-2018
31	EM1G-075406	U Thin	Ta Lin Gyi	23-02-2017	23-03-2018
32	EM1G-074415	U Sin Ma	Ta Lin Gyi	24-02-2017	23-03-2018
33	EM1G-075747	Daw Aye Aye Thein	Ta Lin Gyi	23-02-2017	23-03-2018
34	EM1G-074733	U Nyi Nyi Lwin	Kin Bag	22-02-2017	22-03-2018
35	EM1G-074573	U Wai Tun	Kin Bag	25-02-2017	22-03-2018
36	EM1G-075380	Daw Khin Mar Win	Kin Bag	22-02-2017	22-03-2018
37	EM1G-074435	U Tun Tun Naing	Kin Bag	25-02-2017	22-03-2018
38	EM1G-075136	U Tin Mg Htay	Kin Bag	22-02-2017	22-03-2018
39	EM1G-076091	Daw Nu Nu Ye	Kin Bag	22-02-2017	22-03-2018
40	EM1G-075906	Daw Su Su Win	Kin Bag	22-02-2017	22-03-2018
41	EM1G-074848	Daw Mar Ye	Kin Bag	25-02-2017	22-03-2018
42	EM1G-074101	U Nu	Kin Bag	22-02-2017	22-03-2018
43	EM1G-075646	Daw Aye Thein	Kin Bag	28-02-2017	22-03-2018
44	EM1G-075969	U Htein Htein Win	Kin Bag	25-02-2017	22-03-2018

45	EM1G-074542	U Naw Sai Aung	Kin Bag	22-02-2017	22-03-2018
46	EM1G-075618	U Than	Shwe Totel Kone	25-10-2016	16-03-2018
47	EM1G-075478	U Myint	Shwe Totel Kone	16-10-2016	16-03-2018
48	EM1G-075658	U Kyaw Moe	Shwe Totel Kone	16-10-2016	16-03-2018
49	EM1G-075633	U Kyaw Htiek	Shwe Totel Kone	25-10-2016	16-03-2018
50	EM1G-074687	Daw Yin Nu	Shwe Totel Kone	16-10-2016	16-03-2018
51	EM1G-076016	Daw Mya Shwe	Shwe Totel Kone	16-10-2016	16-03-2018
52	EM1G-074383	U Naing Lin	Shwe Totel Kone	16-10-2016	16-03-2018
53	EM1G-075196	U Kyaw Aung	Shwe Totel Kone	16-10-2016	16-03-2018
54	EM1G-074332	Daw Hla Mal	Shwe Totel Kone	16-10-2016	16-03-2018
55	EM1G-074156	Daw Mar Mar San	Myaing Thar	27-02-2017	20-03-2018
56	EM1G-076248	Daw Eu	Myaing Thar	27-02-2017	20-03-2018
57	EM1G-074143	Daw Kyi Kyi Nu	Myaing Thar	23-02-2017	20-03-2018
58	EM1G-075035	Daw Sein Aye	Myaing Thar	24-02-2017	20-03-2018
59	EM1G-075893	Daw Khin Than Shwe	Myaing Thar	26-02-2017	20-03-2018
60	EM1G-074074	Daw Than Tin Win	Myaing Thar	23-02-2017	20-03-2018
61	EM1G-075115	Daw Thin Thin Khing	Myaing Thar	26-02-2017	20-03-2018

62	EM1G-075812	Daw Khin Win	Myaing Thar	25-02-2017	20-03-2018
63	EM1G-074765	Daw Mar Moe	Myaing Thar	24-02-2017	20-03-2018
64	EM1G-075103	Daw Sein Sein New	Myaing Thar	23-02-2017	20-03-2018
65	EM1G-075052	U Min	Myaing Thar	26-02-2017	20-03-2018
66	EM1G-075422	Daw San Hla	Myaing Thar	24-02-2017	20-03-2018
67	EM1G-074513	Daw Yi Win	Nga Zin Yine	26-01-2017	21-03-2018
68	EM1G-074846	Daw Tin Than	Nga Zin Yine	25-01-2017	21-03-2018
69	EM1G-074015	Daw Aye San	Nga Zin Yine	25-01-2017	21-03-2018
70	EM1G-075325	U Kyaw Sain	Nga Zin Yine	18-01-2017	21-03-2018
71	EM1G-074972	Daw Wai Aung	Nga Zin Yine	18-01-2017	21-03-2018
72	EM1G-074835	Daw Aye Maw	Nga Zin Yine	25-01-2017	21-03-2018
73	EM1G-074853	Daw Zin Mar Oo	Nga Zin Yine	25-01-2017	21-03-2018
74	EM1G-074016	U Myint Oo	Nga Zin Yine	22-01-2017	21-03-2018
75	EM1G-075254	Daw Lan	Nga Zin Yine	23-02-2017	21-03-2018
76	EM1G-076218	U Win Oo	Nga Zin Yine	29-01-2017	21-03-2018
77	EM1G-075786	U Myo Myo	Taung Kine	23-02-2017	22-03-2018
78	EM1G-074009	U Wai Phyo Aung	Taung Kine	24-02-2017	22-03-2018

79	EM1G-075257	U Myint lwin	Taung Kine	24-02-2017	22-03-2018
80	EM1G-075400	Daw Yin	Taung Kine	25-02-2017	22-03-2018
81	EM1G-075062	U Kyaw Mg	Taung Kine	23-02-2017	22-03-2018
82	EM1G-074966	U Myint Moe	Taung Kine	23-02-2017	22-03-2018
83	EM1G-074576	U Myint Aung	Taung Kine	24-02-2017	22-03-2018
84	EM1G-074963	Daw Than Yin	Taung Kine	23-02-2017	22-03-2018
85	EM1G-074116	U Hla Ohm	Taung Kine	23-02-2017	22-03-2018
86	EM1G-075792	U Aye Ko	Taung Kine	23-02-2017	22-03-2018
87	EM1G-076041	Daw Cho	Taung Kine	28-02-2017	22-03-2018
88	EM1G-075773	Daw Yu Yu	Taung Kine	28-02-2017	22-03-2018
89	EM1G-076279	Daw Chaw Su	Sapar Twin	24-02-2017	20-03-2018
90	EM1G-074160	Daw Than Than Aye	Sapar Twin	24-02-2017	20-03-2018
91	EM1G-074459	Daw Mi Khing	Sapar Twin	24-02-2017	20-03-2018
92	EM1G-074866	Daw Lone Yin	Sapar Twin	24-02-2017	20-03-2018
93	EM1G-076234	Daw Khin May Si	Sapar Twin	23-02-2017	20-03-2018
94	EM1G-075057	Daw Phyu Phyu Khing	Sapar Twin	24-02-2017	20-03-2018
95	EM1G-075328	Daw Hla Hla	Sapar Twin	24-02-2017	20-03-2018
96	EM1G-074879	Daw Khin Mar Than	Sapar Twin	24-02-2017	20-03-2018
97	EM1G-075578	Daw Htay Yi	Sapar Twin	23-02-2017	20-03-2018
98	EM1G-075111	Daw Phyu Thae	Sapar Twin	24-02-2017	20-03-2018
99	EN1G-076303	Daw Khin Thandar	Hta Naung Kine Kone	24-01-2017	19-03-2018

100	EM1G-076244	U Aung Win	Hta Naung Kine Kone	26-02-2017	19-03-2018
101	EM1G-075782	Ma Khin Mar Oo	Hta Naung Kine Kone	24-01-2017	19-03-2018
102	EM1G-074845	Ko Soe	Hta Naung Kine Kone	24-01-2017	19-03-2018
103	EM1G-074811	Daw San	Hta Naung Kine Kone	25-01-2017	19-03-2018
104	EM1G-075290	Daw Mya	Hta Naung Kine Kone	25-01-2017	19-03-2018
105	EM1G-075278	U Hla Ngwe	Hta Naung Kine Kone	25-01-2017	19-03-2018
106	EM1G-074875	Daw Tin Thaung	Hta Naung Kine Kone	26-01-2017	19-03-2018
107	EM1G-074049	U Zaw Mi Naing	Hta Naung Kine Kone	24-01-2017	19-03-2018
108	EM1G-074028	U Zaw Min Tun	Hta Naung Kine Kone	24-01-2017	19-03-2018
109	EM1G-074502	Daw Cho Thae	Hta Naung Kine Kone	26-01-2017	19-03-2018
110	EM1G-074841	Daw Sandar Win	Hta Naung Kine Kone	26-01-2017	19-03-2018