

EFFICIENT COOKSTOVES TO MITIGATE GLOBAL WARMING AND CONTRIBUTE TO POVERTY ALLEVIATION IN CAMBODIA



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Project Title	EFFICIENT COOKSTOVES TO MITIGATE GLOBAL WARMING AND CONTRIBUTE TO POVERTY ALLEVIATION IN CAMBODIA
Version	00

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Summary:

Bureau Veritas Certification has made the verification of the Fuel-Wood Saving with Improved Cook stoves in Cambodia Project.

The verification scope is defined as a periodic independent and objective review and an ex-post determination of the monitored reductions in GHG emissions during defined verification period and consisted of the following three phases: i) desk review of the project design, baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in the Verification Protocol. There are 2 CARs and 6 CLs opened and closed during the sixth verification. Taking into account this output, the project proponent revised its Monitoring Report Document and other related document. In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology: Improved Efficiency in Use of Non-Renewable Biomass Reference: Climate Care Trust, derived from proposed methodology SSC.II.G., amended by the Joanneum Institute and approved by the community of practice (HEDON, Stove and Carbon Special Interest Group) and meets the relevant VCS requirements and local legislation.

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: 01/01/2011 to 31/12/2011

Emission reductions: 349,352 tCO₂e

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1 INTRODUCTION

1.1 Objective

Verification is the periodic independent review and ex-post determination by the verification body of the monitored reductions in GHG emissions during defined verification period

The verification serves as project description verification and its requirement of all VCS projects. The verification is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant VCS version 3 and host country criteria are validated in order to confirm that the project description, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation voluntary carbon units (VCUs).

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the project design document/ project description document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against VCS version 3 requirements and associated interpretations. The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvements of the project monitoring towards reductions in the GHG emissions.

1.3 Level of assurance

The verification report is based on VCS PD, monitoring report, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured to provide the credibility of all above.

1.4 Summary Description of the Project

Title of project activity: Fuel-Wood Saving with Improved Cook Stoves in Cambodia

Project Participants: Groupe Energies Renouvelables, Environnement et Solidarités (GERES) - Cambodia

Project partner: WENETCAM (Wood Energy Network of Cambodia) and DATe (Development and Appropriate Technology)

Location of the project activity: The project is located at 9 provinces: Kandal, Kompong Speu, Prey Veng, Takeo, Siem Reap, Battambang, Kampong Cham and Kompong Chhnang, Cambodia and 1 city : Phnom Penh

The project was initiated as part of the Cambodian Fuel-wood Saving Project (CFSP), which was created to reduce the wood consumption in Cambodia in order to protect its forest resources. There are three phases of the project.

Phase I of the project began in 1997 and ended in 2001. This phase was primarily a set up phase which elaborated stove design, trained producers and developed a distribution network for the New Lao Stove (NLS).

Phase II of the project started in 2002 and was completed in January 2007. Phase II focused on developing the commercialized distribution of the stove design.

Phase III (current) phase involves scaling-up of the project to achieve large-scale dissemination, and is distinguished from the first two phases by its funding source; carbon finance. The project had been co-financed by the EU and, following the end of start-up funding, additional capital was sought in the form of carbon financing to not only complete the financing of the first two phases but also increase market penetration.

The ultimate goal of the project is to facilitate a nationwide shift from inefficient exploitation of fuel wood to sustainable and efficient biomass use.

Apart from avoiding GHG emissions by reduced wood and charcoal combustion, the project also contributes to improvements in a number of areas: Avoidance of overexploitation of the forests reduction of airborne particles emission and associated respiratory diseases; time saving in firewood collection, reduction of purchased fuel costs, and transfer of technology to indigenous people and creation of employment opportunities.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

The validation process has been conducted by Det Norske Veritas with issued date as of 7 June 2007. This report is publicly available on v-c-s.org website at link <https://vcsprojectdatabase1.apx.com/myModule/Interactive.asp?Tab=Projects&a=2&i=181&lat=11%2E548278&lon=104%2E915083&bp=1>

2.2 Validation Findings

2.2.1 Gap Validation

Not Applicable.

2.2.2 Methodology Deviations

Not Applicable.

2.2.3 New Project Activity Instances

The project is not registered under grouped project activity and there is no inclusion of new project activities in this verification period.

2.3 Validation Conclusion

As stated in validation report, validation team gave opinion that the project correctly applies and meets the relevant VCS requirements and the relevant host country criteria. The validation was based on the information made available to validation team and the engagement conditions detailed in validation process.

3 VERIFICATION PROCESS

3.1 METHOD AND CRITERIA

The overall verification process, from Contract review to Verification report & Opinion, was conducted using Bureau Veritas Certification Holding SAS's internal procedures.

The verification process consisted of the following steps:

- A desk review of the VCS PD and supporting documents with the use of the requirements of SSC.II.G., amended by the Joanneum Institute and approved by the community of practice (HEDON, Stove and Carbon Special Interest Group) and meets the relevant VCS requirements and local legislation and related tools, in accordance with VCS standard version 3.
- A desk review of monitoring report and supporting documents submitted by the project proponent.

- On-site inspections, review of performance records, interviews with project proponents and on-site operators, collection of measurements, observation of established practices and testing of the accuracy of monitoring equipment
- Review of monitoring results and verification of the correct application of monitoring methodologies
- Follow-up responses to Clarification and Corrective Action Requests
- Verify calculation formula and results and crosscheck data from original sources as appropriate
- Determination of the reductions in GHG emissions

3.2 Document Review

The document review has been conducted as follows:

#	Title
1.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Project Description (Final Draft)
2.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Monitoring Report (1 st January 2011 – 31 st December 2011) version 3 dated 30/01/2012
3.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Monitoring Report (1 st January 2011 – 31 st December 2011) version 4 dated 06/02/2012
4.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Monitoring Report (1 st January 2011 – 31 st December 2011) version 5 dated 21/02/2012
5.	Emission Reduction Calculation Spreadsheet (1 st January 2011 – 31 st December 2011) version 1
6.	Revised Emission Reduction Calculation Spreadsheet (1 st January 2011 – 31 st December 2011) version 2
7.	Revised Emission Reduction Calculation Spreadsheet (1 st January 2011 – 31 st December 2011) version 3
3.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Validation Report (07/06/2007)
4.	Efficient Cookstoves to Mitigate Global Warming and Contribute to Poverty Alleviation in Cambodia – Verification Report (1 st January 2010 – 31 st December 2010)

3.3 Interviews

The verification team interviewed the following persons as part of verification process.

#	Name	Title	Organization
1.	Kimberley BUSS	CDM Analyst	GERES-Cambodia
2.	HEP Sokhannaro	NLS Project Manager	GERES-Cambodia
3.	Marina Gavaldao	Climate Change Unit Technical Director	GERES-France
4.	Paola Clerino	Carbon Finance Expert	GERES-Mali
5.	Iwan Baskoro	IGS Program Director	GERES-Cambodia
6.	Sann Saly	Monitoring Team Leader	GERES-Cambodia
7.	Chheang Tol	Testing Team Leader	GERES-Cambodia

3.4 Site Inspections

Site inspections have been performed according to the following schedule.

#	Date	Site Inspection
1.	13 April 2012	<u>NLS producers</u> Dourng Saronn Khoem Tim Phun Sophal Dul Sam Oun <u>NLS middle man</u> Bun Somaly <u>NLS retailer</u> Chear Roeun Pol Neang Meas Sovann Neam Seren
2.	14 April 2012	<u>NLS producer</u> Ris Sarath Sim Sour Ven Chomraeun Kem Sokha Phon Somen Keo Chanthear Mom Samean Sun Tha Phon Sopha Vann Tola <u>NLS middle man</u> Sim Srun <u>NLS retailers</u> Mao sareth Han sohak Ros phois Rin sokha So savuthy Soeng Soeun
3.	15 April 2012	Office of GERES-Cambodia

3.5 Resolution of Any Material Discrepancy

There is no any material discrepancy during this verification period.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The proposed project activity is to reduce charcoal and thereby fuel wood consumption by introducing improved Lao cook stoves in Cambodia. It is implemented and has been in operation since May 10, 2003, when the commercial manufacturing, distribution and sales of NLS commenced. The project started the management and monitoring of quantity produced by the producers and the quantity of NLS sold to the distributors as input to a Voluntary Carbon Standard project since May 10, 2003.

The verifier had conducted on-site activities during 13-15 February 2012 and found that the project was implemented as stated in the validated Project Description. The New Lao Stoves is still produced, distributed and sold in nine difference provinces (Kandal, Kampot, Prey Veng, Takeo, Siem Reap, Battambang, Kampong Cham, Kampong Chhnang and Pursat) and one city (Phnom Penh) in Cambodia. The structure and activities of the NLS team-Quality Control and Monitoring (QCM) is consistent with the Monitoring Report (1st January 2011 – 31st December 2011) and the quality assurance and quality control procedures has been applied to all NLS producers in accordance with the monitoring plan such as QC Label record, production and sold record etc.

With reference to interviewed to the CDM Analyst namely “Kimberley BUSS” and the NLS Testing (Performance Quality Control) Team Leader namely “CHHEANG Tol” and also accessed to the Calculation Spradsheet and Raw Data of Testing Results of “Adated Water Boiling Test (AWBT)”. The verifier found that there were three sizes of NLS (A1, A2 and A3) have been included in the testing plan. The CDM Analyst and NLS Testing Team Leader explained that the AWBT will be conducted only the NLS's size that have more than 5% of market share hence four sizes of NLS A00, A0, A4 and A5 are excluded.

The verifier had accessed to the “NLS Production and Selling Report 2011 Short by Stove Type”. It is confirmed that the market share of NLS in year 2011 can be summarized as follows:

NLS Size	Market Share (%)
A00	0.26
A0	0.52
A1	58.41
A2	24.48
A3	12.35
A4	3.97
A5	0.0087

With reference to Market Share that presented in table above. The NLS size A1, A2 and A3 were sold in year 2011 with the Market Share 58.41, 24.48 and 12.35% respectively while the NLS size A00, A0, A4 and A5 were a few sole in year 2011 with the Market Share 0.26, 0.52, 3.97 and 0.0087% respectively. Therefore it is confirmed that A1, A2 and A3 were the main contribute of Market Share in year 2011 and A00, A0, A4 and A5 had Market Share less than 5% as per the CDM Analyst and NLS Testing Team Leader's explanation.

However the CDM Analyst and NLS Testing Team Leader confirmed that Adated Water Boiling Test (AWBT) has been conduted for NLS size A00, A4 and A5 in year 2009. Hence the verifier has accessed to the testing result and found that:

NLS Size	AWBT testing result in year 2009 (% of Efficiency)
A00	29.3
A4	34.2
A5	45.2

With reference to “New Lao Stove Project Quality Control Monitoring Procedure Manual”. The percent of efficiency for both Adated Water Boiling Test (AWBT) and Household Fuel Consumption Test (HFCT) is “ $\geq 27\%$ of Efficiency”. Therefore AWBT of A00, A4 and A5 that conducted in year 2009 were “passed” the reference criteria.

However the verifier raised **FAR1** to the Project Proponent by the following reasons:

- The NLS size A0 never been conducted HFCT before. Hence it should be conducted in year 2012 to confirm its efficiency.
- The NLS size A4 has 3.97% of Market Share in year 2011 and the verifier found that it is continue produced in middle lot in year 2012.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The verifier had accessed to the EXCEL files of “Emission Calculation Spreadsheet and NLS Data Base Jan 1st – Dec 31st 2011” and found that the Emission Reduction calculation has been calculated by the following algorithm:

Parameters	Calculation Equation
Emission Reduction	(Baseline Emission – 15% of leakage deduction) – Transport Emission
Baseline Emission	Total Biomass Saving x NCV of Biomass x Emission Factor of Biomass
Total Biomass Saving	Wood Saving + Charcoal Saving
Wood Saving	Wood Usage x 20.89% of Wood Saving by Household Cooking Test
Charcoal Saving	Charcoal Usage x 21.12% of Charcoal Saving by Household Cooking Test
Wood Usage	(Number of Stove units in use $\div$ 1.23 of equipment ratio) x (Traditional Wood Consumption)
Charcoal Usage	(Number of Stove units in use $\div$ 1.23 of equipment ratio) x (wood to charcoal ratio) x (Traditional Charcoal Consumption)
Number of Stove units in use each month	Number of Stove units in use last month – Number of unit retired last month + ((1-A) x Number of Stove units sold last month) + (A x Number of Stove units sold last two month)
Number of unit retired	Number of Stove units sold last 18 month.
Number of Stove units sold	Stove sold to the Middle Man + Stove sold to the End User.

The verifier had accessed to “Log Books”, “Testing Results” and “Raw Data Records” to verify each parameter that used to calculate the emission reduction during period 1st January – 31st December 2011 as follows:

(1) Wood saving and Charcoal saving which is the result of the “Household Fuel Consumption Test (HFCT)”

The verifier had accessed to the Calculation Spradsheets of Household Fuel Consumption Test (HFCT) that conducted in year 2011 as follows:

- ✓ HFCT TLS Food and Time Round 01, 2011
- ✓ NLS Food &Time Round, 01_2011 (Dry Season)
- ✓ HFCT TLS Food and Time Round 01, 2011
- ✓ NLS Food&Time Round, 01_2011 (Rainy season)

The HFCT has been done for the Traditional Lao Stove (TLS) size B3 and the New Lao Stove size A1 according to

- NLS size A1 had the highest Market Share since project start to implemented in year 2003 until year 2011.
- TLS size B3 had "Combustion Chamber Volume" similar with NLS size A1. Although the sold record in year 2011 showing that TLS size B3 has 20,502 of sold out less than 35,292 of TLS size B2 sold out .

The verifier had accessed to the Testing Result of HFCT in year 2011 and confirmed that the Raw Data has been transferred into the Calculation Spradsheets correctly.

(2) Equipment Ratio & Stove Life Time

The verifier had accessed to the SPSS of National User Survey in year 2011. It is confirmed that the sample size has been selected by the statistical method as explained in the monitoring report. The 716 set of valid questionnaires had accessed during site visit and confirmed that the survey was conducted since July 2011. The questionnaires are cover questions about equipment ratio and stove lifetime and confirmed that all informations have been transferred to Spreadaheet and SPSS correctly and consistent with the SPSS Input Data.

(3) POST 2008

The verifier had accessed and sampling to the "NLS Purchase Bill" and "NLS Sale Bill" in year 2011 of the "NLS Retailers" to ensure that the "53.4 days of Stove Shelf Life" that used to calculate the concept of time lapse production and stove utilization since year 2008 is still "valid" and "conservative" in year 2011. The verifier found that the time of NLS sold from the producers until sold from the retailers to end users are "quite less than 53.4 days".

(4) Number of stove sold

The verifier had verified the number of stove sold by 100% cross checked between number of stove sold record in the Producer's Log Book and the Emission Calculation Spreadsheet and cross checked the monthly data transferred from the Producer's Log Book into the Emission Calculation Spreadsheet by select sampling from the producers who are the main contribute of NLS stove sold in year 2011. It is confirmed that Number of stove sold that used to calculate the Emission Reduction on the Spreadsheet have been transferred from the Producer's Log Book cotrectly.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

In term of quality of evidence, the verifier did verify reliability and credibility of evidences submitted for verification such as Producer's Log Book, Calculation Spradsheets of Household Fuel Consumption Test (HFCT) that conducted in year 2011, SPSS's file of National User Survey in year 2011, NLS Purchase Bill in year 2011, NLS Sale Bill in year 2011

During verification process, the NLS producers, NLS project manager, QCM staffs and Geres-Cambodia management team were interviewed. Based on their responses during interview process, verification team verified their claims emission reduction in period 1st January – 31st December 2011 is credibility and reliability in term of quality of evidence and consistency of data can be confirmed.

4.4 Management and Operational System

During site visit on 13-15/02/2012, the verifier had interviewed the GERES's staffs who have responsibilities and authorities for monitoring and reporting. It is confirmed that the structure and activities are as following details

- ✓ **QCM Team** are including Physical QC, Performance QC&Test and Monitoring
- ✓ **Physical QC** has reponsible for Stove Dimension Test, Clay Testing and Technical Support

- ✓ **Performance QC&Test** has responsible for Adapted Water Boiling Test (AWBT) and Household Fuel Consumption Test (HFCT)
- ✓ **Monitoring** has responsible for Data Collection, QC Label Tracking and Date Stamp
- ✓ **The QCM Manager and Team Leaders** are including

Position	Name
NLS Project Manager	HEP Sokhannaro
NLS Monitoring Team Leader	SAN Saly
NLS Quality Control (Physical) Team Leader	SREY Makara
NLS Testing (Performance Quality Control) Team Leader	CHHEANG Tol

The verifier had accessed to the GERES's document namely "New Lao Stove Project Quality Control Monitoring Procedure Manual". The content of this Procedure Manual are cover all QA/QC activities that referred in the monitoring plan including

- ✓ Physical (QC Stove Dimension Test, Clay Testing etc.)
- ✓ Adated Water Boiling Test (AWBT)
- ✓ Household Fuel Consumption Test (HFCT)
- ✓ Data Collection, QC Label Tracking and Date Stamp

The verifier found that the content of this Procedure Manual is also included the "Procedure for New Producer Approval".

During site visit on 13-15/02/2012, the verifier found that the quality assurance and quality control procedures been applied to all NLS producers in accordance with the monitoring plan such as QC Label record, production and sold record etc.

5 VERIFICATION CONCLUSION

Conclusion of verification process for period of 1st January to 31st December 2011 is based on verification finding from desk review and onsite inspection process including interviewing with NLS producers, key operational staff from GERES-Cambodia during period of 13-15/02/2012. The verifier confirms that calculation of greenhouse gas emission reduction is in accordance with registered VCS project description and principle of VCS version 3.0. The emission reduction as stated below was correctly calculated in accordance with baseline and monitoring methodology: Improved Efficiency in Use of Non-Renewable Biomass Reference: Climate Care Trust, derived from proposed methodology SSC.II.G., amended by the Joanneum Institute and approved by the community of practice (HEDON, Stove and Carbon Special Interest Group) and related tools. The verified emission reduction for period of 1st January to 31st December 2011 can be concluded as follows:

GHG Emission Reductions or Removals (1 st January to 31 st December 2011)	tCO ₂ e
Baseline Emissions	1,943,414
Project Emissions	1,532,409
Leakage	61,653
Net GHG emission reductions or removals	349,352

VERIFICATION PROTOCOL

Table 1 Verification requirements of “Efficient Cookstoves to mitigate global warming and contribute to poverty alleviation in Cambodia” based on the Voluntary Carbon version 3.1

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
1. Project implementation in accordance with the registered project document			
a. Are all physical features of the proposed VCS project proposed in the registered PD in place?	Yes. The proposed project activity is to reduce charcoal and thereby fuel wood consumption by introducing improved Lao cook stoves in Cambodia.	OK	OK
b. Have the project participants operated the proposed VCS project as per the registered PD?	Yes. With reference to the Monitoring Report 1st January – 31 December 2011 version 4 dated 06/02/2012. It is confirmed that the project participant is Group Energies Renewable, Environmental and Solidarities (GERES)-Cambodia as per the registered PD.	OK	OK
c. Was an on-site visit conducted?	Yes. The on-site visit had been conducted during 13-15 February 2012.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
d. If not, justify the rationale of the decision.	Not Applicable.	-	-
e. Does the implementation or operation of VCS project conform with the description contained in the registered PD?	Yes. The project activity has been implemented under Type II category (Energy Efficiency Improvement Projects). The Improved Cook Stoves have been implemented in Cambodia as a part of the larger Cambodian Firewood Saving Project (CFSP). The verifier had conducted the onsite visit to the NLS Producers, Middle Men and Retailers during 13-15/02/2012. The people who were interviewed and observed their activities as follows: <u>NLS producer</u> ▪ Dourng Saronn (New Producer) ▪ Ven Chomraeun (New Producer) ▪ Kem Sokha (New Producer) ▪ Khoem Tim ▪ Phun Sophal ▪ Dul Sam Oun ▪ Ris Sarath ▪ Sim Sour ▪ Phon Somen	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	▪ Keo Chanthear ▪ Mom Samean ▪ Sun Tha ▪ Phon Sopha ▪ Vann Tola <u>NLS Middleman</u> ▪ Bun Somaly ▪ Sim Srun <u>NLS Retailers who the main buyer of Bun Somary</u> ▪ Mao Sareth ▪ Han Sohak ▪ Ros Phois ▪ Rin Sokha ▪ So Savuthy ▪ Chear Roeun		

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	<u>NLS Retailers who the main buyer of Sim Srun</u> ▪ Pol Neang ▪ Meas Sovann ▪ Neam Seren ▪ Soeng Soeun With reference to the onsite visit to the NLS Producers, Middle Men and Retailers above. It is confirmed that the implementation or operation of VCS project conform with the description contained in the registered PD		

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
f. If not, which are the potential impacts due to these changes?	Not Applicable.	-	-
2. Compliance of the monitoring plan with the monitoring methodology			
a. Is the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project?	Yes. With reference to the monitoring report 1 st January – 31 December 2011 version 4 dated 06/02/2012. It is confirmed that the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project.	OK	OK
b. Are there any monitoring aspects of the project that are not specified in the methodology (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	No.	OK	OK
3. Compliance of monitoring with the monitoring plan			
a. Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	Yes.	OK	OK
b. Have all parameters stated in the monitoring plan, the applied methodology been sufficiently monitored and updated as applicable, including:	-	-	-
i. Project emission parameters?	Not Applicable.	-	-
ii. Baseline emission parameters?	With reference to section D.3 of the registered PD. The data to be monitored are including	CL1 CL2	OK OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl						
	<table><tr><th>Data/Parameter to be monitored</th><th>Description</th></tr><tr><td>Representative sample of mass of biomass used before and after installation of devices and efficiency measures (kg/month/family).</td><td>Bi-annual survey results will demonstrate the average consumption per family. These results will be combined with efficiency savings of NLS and monthly sales data to monitor mass of biomass used before and after installation of efficiency devices.</td></tr><tr><td colspan="2">Means of verification: The verifier has accessed to the EXCEL files of “Household Fuel Consumption Test (HFCT)” cover both wet and dry seasons. The testing results also cover the wood and charcoal consumption per family in case of Traditional Laos Stove but could not compare with the parameter “Traditional Fuel Consumption” that showed in the Table 2 of the Monitoring Report 1st January – 31st December 2011 version 3.It need to be clarified (Please refer to CL1)</td></tr></table>	Data/Parameter to be monitored	Description	Representative sample of mass of biomass used before and after installation of devices and efficiency measures (kg/month/family).	Bi-annual survey results will demonstrate the average consumption per family. These results will be combined with efficiency savings of NLS and monthly sales data to monitor mass of biomass used before and after installation of efficiency devices.	Means of verification: The verifier has accessed to the EXCEL files of “Household Fuel Consumption Test (HFCT)” cover both wet and dry seasons. The testing results also cover the wood and charcoal consumption per family in case of Traditional Laos Stove but could not compare with the parameter “Traditional Fuel Consumption” that showed in the Table 2 of the Monitoring Report 1 st January – 31 st December 2011 version 3.It need to be clarified (Please refer to CL1)		CL3	OK
	Data/Parameter to be monitored	Description							
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<table><tr><th>Data/Parameter to be monitored</th><th>Description</th></tr><tr><td>Annual check of representative samples to ensure that they are still operating or replaced by an</td><td>The project activity uses a conservative estimate of three years lifespan per stove. After that</td></tr></table>	Data/Parameter to be monitored	Description	Annual check of representative samples to ensure that they are still operating or replaced by an	The project activity uses a conservative estimate of three years lifespan per stove. After that					
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Annual check of representative samples to ensure that they are still operating or replaced by an	The project activity uses a conservative estimate of three years lifespan per stove. After that								

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl														
	<table><tr><td>equivalent in service appliance or measure. ▪ Stove lifetime (years) ▪ Number of stoves sales per month </td><td>period the stove is assumed to be replaced, these stoves are deducted from the monthly stove sales. Thus monitoring system adopts a conservative value to ensure that the ER takes the replacement of stove units into consideration.</td></tr></table> Means of verification: The verifier has reviewed the Monitoring Report 1st January – 31 December 2011 version 3 and found that the “Stove Lifetime” has been monitored as a part of the User Survey. Table 2 and 4 is showed that the “Stove Lifetime” that used to calculate the Emission Reduction in year 2011 is “1.5 years” less than the previous 5 years. However there is no any explanation of raw data interpret to 1.5 years of Stove Lifetime is contained in the Monitoring Report. It need to be clarified (Please refer to CL3) <table><tr><th>Data/Parameter to be monitored</th><th>Description</th></tr><tr><td>Monitoring shall include the efficiency of the appliances (%)</td><td>Monitoring unit will test samples from stove producers to measure the efficiency of stoves constructed by producers</td></tr></table> Means of verification: The verifier has reviewed the Monitoring Report 1st January – 31 December 2011 version 3 and found the “Fuel Saving” has been indicated in Table 2 as 37.56 and 32.12 kg/month in case of “wood” and “charcoal” respectively. The verifier has accessed to the EXCEL files of “Household Fuel Consumption Test (HFCT)” cover both wet and dry seasons. The testing results in term of “Fuel Saving” is cover the wood and charcoal as follows: <table><tr><th rowspan="2">Season</th><th colspan="2">Fuel Saving (%)</th></tr><tr><th>Wood</th><th>Charcoal</th></tr><tr><td>Wet</td><td>20.05</td><td>19.74</td></tr></table>	equivalent in service appliance or measure. ▪ Stove lifetime (years) ▪ Number of stoves sales per month	period the stove is assumed to be replaced, these stoves are deducted from the monthly stove sales. Thus monitoring system adopts a conservative value to ensure that the ER takes the replacement of stove units into consideration.	Data/Parameter to be monitored	Description	Monitoring shall include the efficiency of the appliances (%)	Monitoring unit will test samples from stove producers to measure the efficiency of stoves constructed by producers	Season	Fuel Saving (%)		Wood	Charcoal	Wet	20.05	19.74		
equivalent in service appliance or measure. ▪ Stove lifetime (years) ▪ Number of stoves sales per month	period the stove is assumed to be replaced, these stoves are deducted from the monthly stove sales. Thus monitoring system adopts a conservative value to ensure that the ER takes the replacement of stove units into consideration.																
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	Wood	Charcoal															
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CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl											
	<table><tr><td>Dry</td><td>23.59</td><td>26.88</td></tr></table> The verifier could not found the relationship between the testing results in term of “Fuel Saving” in table above could not compare and the “Fuel Saving” that indicated in Table 2 of the Monitoring Report 1st January – 31 December 2011 version 3. It need to be clarified (Please refer to CL1) <table><tr><th>Data/Parameter to be monitored</th><th>Description</th></tr><tr><td>Ensure replaces low efficiency appliances are not used within the boundary.</td><td>Bi-annual survey data on user behavior in addition the stove sales data demonstrates the increasing market share of the NLS over time.</td></tr></table> Means of verification: The verifier has reviewed the Monitoring Report 1st January – 31 December 2011 version 3. It is stated that the proportion of NLS per TLS in both “Number produced” and “Number of sold” is increasing since year 2004 until 2011. The verifier has accessed to the EXCEL files of “Emission Calculation Spreadsheet and NLS Data Base Jan 1st – Dec 31st 2011 version 1” and confirm that the proportion of NLS per TLS in both “Number produced” and “Number of sold” in year 2011 are consistent with the Monitoring Report 1st January – 31 December 2011 version 3. <table><tr><th>Data/Parameter to be monitored</th><th>Description</th></tr><tr><td>Quantity of alternative fuel used by project participants and assessment of aggregate biomass renewability in the region.</td><td>Establish that the trend of biomass use is unsustainable in the long term through independent literature and GIS data. Bi-annual survey data will monitor fuel mix being used.</td></tr></table> Means of verification: The verifier has reviewed the Monitoring Report 1st January – 31 December 2011 version 3. It is explain in section C.2 Environmental Impact – section C.2.1 Non-Renewability that the Forest in Cambodia has been continuous decreased since year 1976 until 2010 by refer to the	Dry	23.59	26.88	Data/Parameter to be monitored	Description	Ensure replaces low efficiency appliances are not used within the boundary.	Bi-annual survey data on user behavior in addition the stove sales data demonstrates the increasing market share of the NLS over time.	Data/Parameter to be monitored	Description	Quantity of alternative fuel used by project participants and assessment of aggregate biomass renewability in the region.	Establish that the trend of biomass use is unsustainable in the long term through independent literature and GIS data. Bi-annual survey data will monitor fuel mix being used.		
Dry	23.59	26.88												
Data/Parameter to be monitored	Description													
Ensure replaces low efficiency appliances are not used within the boundary.	Bi-annual survey data on user behavior in addition the stove sales data demonstrates the increasing market share of the NLS over time.													
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Quantity of alternative fuel used by project participants and assessment of aggregate biomass renewability in the region.	Establish that the trend of biomass use is unsustainable in the long term through independent literature and GIS data. Bi-annual survey data will monitor fuel mix being used.													

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl									
	reference sources including Save Cambodia Wildlife (SCW), Food and Agriculture Organization (FAO) and the Research Paper. The verifier has accessed to all reference sources and found that the information that presented in the Monitoring Report 1st January – 31 December 2011 version 3 is correctness. CL1: Please clarify how to compare the results of “Household Fuel Consumption Test (HFCT)” with the Table 2 of the “Monitoring Report 1st January – 31st December 2011 version 3” in case of <table><tr><th>Item</th><th>Household Fuel Consumption Test (HFCT)</th><th>Monitoring Report 1st January – 31st December 2011 version 3</th></tr><tr><td>1.1</td><td>Wood and charcoal consumption for Traditional Laos Stove</td><td>Traditional Fuel Consumption (37.56 and 32.12 kg/month for wood and charcoal respectively)</td></tr><tr><td>1.2</td><td>The testing results in term of “Fuel (wood and charcoal) Saving” during wet and dry season</td><td>The Fuel Saving (20.89 and 21.20% for wood and charcoal respectively)</td></tr></table> CL2: Please clarify why the results of moisture content of the biomass is not included in the Monitoring Report 1st January – 31 December 2011 version 3. CL3: Please provide all information and objective evidences to explain that how the raw data was interpreted into the 1.5 years of Stove Lifetime.	Item	Household Fuel Consumption Test (HFCT)	Monitoring Report 1 st January – 31 st December 2011 version 3	1.1	Wood and charcoal consumption for Traditional Laos Stove	Traditional Fuel Consumption (37.56 and 32.12 kg/month for wood and charcoal respectively)	1.2	The testing results in term of “Fuel (wood and charcoal) Saving” during wet and dry season	The Fuel Saving (20.89 and 21.20% for wood and charcoal respectively)		
Item	Household Fuel Consumption Test (HFCT)	Monitoring Report 1 st January – 31 st December 2011 version 3										
1.1	Wood and charcoal consumption for Traditional Laos Stove	Traditional Fuel Consumption (37.56 and 32.12 kg/month for wood and charcoal respectively)										
1.2	The testing results in term of “Fuel (wood and charcoal) Saving” during wet and dry season	The Fuel Saving (20.89 and 21.20% for wood and charcoal respectively)										

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl														
iii. Leakage parameters?	Yes. The verifier has accessed to the following original transport bills against what reported in spreadsheet (KBS_12th Jan_transport emission.xls) at GERES office during onsite visit (15 February 2012) <table><tr><th>Original transport bills number</th><th>Consistency check</th></tr><tr><td>G M#4 03070 ICS MS KCN</td><td>OK</td></tr><tr><td>G M#4 040542 QC KCN</td><td>OK</td></tr><tr><td>1M G M#NSA ICS MS KCN</td><td>OK</td></tr><tr><td>G M#2 37767 QC KCN</td><td>OK</td></tr><tr><td>G M#KSN ICS MS KCN</td><td>OK</td></tr><tr><td>G M#CCY ICS MS BTB</td><td>OK</td></tr></table> As evidences found at the office, the verifier can confirm that the above bills are authentic and agree well with data shown in spreadsheet. There is no doubt regarding the correctness of these bills.	Original transport bills number	Consistency check	G M#4 03070 ICS MS KCN	OK	G M#4 040542 QC KCN	OK	1M G M#NSA ICS MS KCN	OK	G M#2 37767 QC KCN	OK	G M#KSN ICS MS KCN	OK	G M#CCY ICS MS BTB	OK	OK	OK
Original transport bills number	Consistency check																
G M#4 03070 ICS MS KCN	OK																
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G M#2 37767 QC KCN	OK																
G M#KSN ICS MS KCN	OK																
G M#CCY ICS MS BTB	OK																
iv. Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	Yes. During site visit on 13-15/02/2012, the verifier had interviewed the GERES's staffs who have responsibilities and authorities for monitoring and reporting. It is confirmed that the structure and activities of the NLS team-Quality Control and Monitoring (QCM) is consistent with section 3.3.7 of the “Monitoring Report 1st January – 31st December 2011 version 4” as	OK	OK														

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl										
	following details ✓ QCM Team are including Physical QC, Performance QC&Test and Monitoring ✓ Physical QC has responsible for Stove Dimension Test, Clay Testing and Technical Support ✓ Performance QC&Test has responsible for Adapted Water Boiling Test (AWBT) and Household Fuel Consumption Test (HFCT) ✓ Monitoring has responsible for Data Collection, QC Label Tracking and Date Stamp ✓ The QCM Manager and Team Leaders are including <table><tr><th>Position</th><th>Name</th></tr><tr><td>NLS Project Manager</td><td>HEP Sokhannaro</td></tr><tr><td>NLS Monitoring Team Leader</td><td>SAN Saly</td></tr><tr><td>NLS Quality Control (Physical) Team Leader</td><td>SREY Makara</td></tr><tr><td>NLS Testing (Performamce Quality Control) Team Leader</td><td>CHHEANG Tol</td></tr></table>	Position	Name	NLS Project Manager	HEP Sokhannaro	NLS Monitoring Team Leader	SAN Saly	NLS Quality Control (Physical) Team Leader	SREY Makara	NLS Testing (Performamce Quality Control) Team Leader	CHHEANG Tol		
Position	Name												
NLS Project Manager	HEP Sokhannaro												
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NLS Testing (Performamce Quality Control) Team Leader	CHHEANG Tol												

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
c. Are equipment controlled and calibrated in accordance with the monitoring plan?	Yes.	OK	OK
d. Are monitoring results consistently recorded as per approved frequency?	Yes. During site visit conducted on 13-15/02/2012, the verifier had accessed to all records of monitoring parameters. It is confirmed that the monitoring results are consistent with the approved frequency.	OK	OK
e. Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?	Yes. With reference to the onsite visit to the NLS Producers, Middle Men and Retailers conducted on 13-15/02/2012. The verifier found that the quality assurance and quality control procedures been applied to all NLS producers in accordance with the monitoring plan such as QC Label record, production and sold record etc. During site visit on 15/02/2012, the verifier had accessed to the GERES's document namely "New Lao Stove Project Quality Control Monitoring Procedure Manual". The content of this Procedure Manual are cover all QA/QC activities that referred in the monitoring plan including ✓ Physical (QC Stove Dimension Test, Clay Testing etc.) ✓ Adated Water Boiling Test (AWBT) ✓ Household Fuel Consumption Test (HFCT) ✓ Data Collection, QC Label Tracking and Date Stamp The verifier found that the content of this Procedure Manual is also included the "Procedure for New Producer Approval".	-	FAR1

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl																
	During site visit on 15/02/2012, the verifier had interviewed to the CDM Analyst namely “Kimberley BUSS” and the NLS Testing (Performamce Quality Control) Team Leader namely “CHHEANG Tol” and also acesssed to the Calculation Spradsheet and Raw Data of Testing Results of “Adated Water Boiling Test (AWBT)”. The verifier found that there were three sizes of NLS (A1, A2 and A3) have been included in the testing plan. The CDM Analyst and NLS Testing Team Leader explained that the AWBT will be conducted only the NLS’s size that have more than 5% of market share hence four sizes of NLS A00, A0, A4 and A5 are excluded. The verifier had accessed to the “NLS Production and Selling Report 2011 Short by Stove Type”. It is confirmed that the market share of NLS in year 2011 can be summarized as follows: <table><tr><th>NLS Size</th><th>Market Share (%)</th></tr><tr><td>A00</td><td>0.26</td></tr><tr><td>A0</td><td>0.52</td></tr><tr><td>A1</td><td>58.41</td></tr><tr><td>A2</td><td>24.48</td></tr><tr><td>A3</td><td>12.35</td></tr><tr><td>A4</td><td>3.97</td></tr><tr><td>A5</td><td>0.0087</td></tr></table> With reference to Market Share that presented in table above. The NLS size A1, A2 and A3 were sold in year 2011 with the Market Share 58.41, 24.48 and 12.35% respectively while the	NLS Size	Market Share (%)	A00	0.26	A0	0.52	A1	58.41	A2	24.48	A3	12.35	A4	3.97	A5	0.0087		
NLS Size	Market Share (%)																		
A00	0.26																		
A0	0.52																		
A1	58.41																		
A2	24.48																		
A3	12.35																		
A4	3.97																		
A5	0.0087																		

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl								
	NLS size A00, A0, A4 and A5 were a few sold in year 2011 with the Market Share 0.26, 0.52, 3.97 and 0.0087% respectively. Therefore it is confirmed that A1, A2 and A3 were the main contribute of Market Share in year 2011 and A00, A0, A4 and A5 had Market Share less than 5% as per the CDM Analyst and NLS Testing Team Leader’s explanation. However the CDM Analyst and NLS Testing Team Leader confirmed that Adated Water Boiling Test (AWBT) has been conduted for NLS size A00, A4 and A5 in year 2009. Hence the verifier has accessed to the testing result and found that: <table><tr><th>NLS Size</th><th>AWBT testing result in year 2009 (% of Efficiency)</th></tr><tr><td>A00</td><td>29.3</td></tr><tr><td>A4</td><td>34.2</td></tr><tr><td>A5</td><td>45.2</td></tr></table> With reference to “New Lao Stove Project Quality Control Monitoring Procedure Manual”. The percent of efficiency for both Adated Water Boiling Test (AWBT) and Household Fuel Consumption Test (HFCT) is “≥27% of Efficiency”. Therefore AWBT of A00, A4 and A5 that conducted in year 2009 were “passed” the reference criteria. FAR1 has been raised to the Project Proponent by the following reasons: • The NLS size A0 never been conducted HFCT before. Hence it should be conducted in year 2012 to confirm its efficiency.	NLS Size	AWBT testing result in year 2009 (% of Efficiency)	A00	29.3	A4	34.2	A5	45.2		
NLS Size	AWBT testing result in year 2009 (% of Efficiency)										
A00	29.3										
A4	34.2										
A5	45.2										

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl																								
	The NLS size A4 has 3.97% of Market Share in year 2011 and the verifier found that it is continue produced in middle lot in year 2012. FAR1: <i>The boiling test in year 2012 should be conducted for size A₀ and A₄ for some producers who have the 1st and 2nd rank in sold record in each size.</i> The verifier had accessed to Adated Water Boiling Test (AWBT) for “New Producers” in year 2011. It was confirmed that NLS produced by all New Producers have been conducted AWBT. The results are showing that their efficiency better than 27% of setting criteria as following details: New Producer Name: Doung Saronn NLS Production: Size A1, A2, A3 <table><tr><th>Testing Date</th><th>NLS Size</th><th>Testing Result in year 2011 (% of Efficiency)</th></tr><tr><td>March 18, 2011</td><td>A1</td><td>29.71 29.47</td></tr><tr><td>March 18, 2011</td><td>A2</td><td>31.15 31.88</td></tr><tr><td>March 18, 2011</td><td>A3</td><td>31.22 31.33</td></tr><tr><td></td><td></td><td></td></tr><tr><td>August 1, 2011</td><td>A1</td><td>30.86 30.64</td></tr><tr><td>July 27, 2011</td><td>A2</td><td>32.74 32.04</td></tr><tr><td>July 27, 2011</td><td>A3</td><td>34.06</td></tr></table>	Testing Date	NLS Size	Testing Result in year 2011 (% of Efficiency)	March 18, 2011	A1	29.71 29.47	March 18, 2011	A2	31.15 31.88	March 18, 2011	A3	31.22 31.33				August 1, 2011	A1	30.86 30.64	July 27, 2011	A2	32.74 32.04	July 27, 2011	A3	34.06		
Testing Date	NLS Size	Testing Result in year 2011 (% of Efficiency)																									
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August 1, 2011	A1	30.86 30.64																									
July 27, 2011	A2	32.74 32.04																									
July 27, 2011	A3	34.06																									

CHECKLIST QUESTION	COMMENTS			Draft Concl	Final Concl
			36.06		
	November 2, 2011	A1	35.93 34.51		
	November 2, 2011	A2	35.96 36.52		
	November 3, 2011	A3	32.66 31.64		
	New Producer Name: Ven Chomraeun NLS Production: Size A1, A2, A3				
	Testing Date	NLS Size	Testing Result in year 2011 (% of Efficiency)		
	March 29, 2011	A1	32.08 33.38		
	March 29, 2011	A2	33.23 34.18		
	March 29, 2011	A3	30.72 31.40		
	June 21, 2011	A1	36.49 37.05		
	July 12, 2011	A2	36.67 36.56		
	June 21, 2011	A3	41.89 41.14		
	October 25, 2011	A1	28.17 28.38		
	October 25, 2011	A2	30.38 30.93		

CHECKLIST QUESTION	COMMENTS			Draft Concl	Final Concl
	October 24, 2011	A3	32.02 33.08		
	During site visit on 15/02/2012, the verifier had reviewed the “GERES Training Record in year 2011”. It is confirmed that the new QCM staffs have been trained and passed the evaluation before started their work as the following details. Training Date: Mar 11, 2011 (07.30 – 11.30 am) Trainer: CHHEANG Tol NLS (Performamce Quality Control Team Leader) Trainees: Kong Samath, Ken Tim, Thav Channy, Tey Sarin Course Outline: HFCT, AWBT and others. Evaluate Date: April1, 2011 Evaluation Result: Passed.				

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
4. Assessment of data and calculation of greenhouse gas emission reductions			
a. Is a complete set of data for the specified monitoring period available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the validator shall make the most conservative assumption theoretically possible in finalizing the verification report).	Yes.	OK	OK
b. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	Yes. During site visit on 15/02/2012, the verifier had interviewed to the CDM Analyst namely “Kimberley BUSS” and the NLS Testing (Performance Quality Control) Team Leader namely “CHHEANG Tol” and also accessed to the Calculation Spradsheets and/or Log Books and/or Testing Results of the parameters that used to calculate the Emission Reduction as follows: 1. Wood saving and Charcoal saving which is the result of the “Household Fuel Consumption Test (HFCT)” The verifier had accessed to the Calculation Spradsheets of Household Fuel Consumption Test (HFCT) that conducted in year 2011 as follows: ✓ HFCT TLS Food and Time Round 01, 2011 ✓ NLS Food &Time Round, 01_2011 (Dry Season) ✓ HFCT TLS Food and Time Round 01, 2011 ✓ NLS Food&Time Round, 01_2011 (Rainy season)	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl								
	The verifier found that HFCT has been done for the Traditional Lao Stove (TLS) size B3 and the New Lao Stove size A1. The CDM Analyst explained that the NLS size A1 and TLS size B3 are the representatives for HFCT by the following reasons ▪ NLS size A1 had the highest Market Share since project start to implemented in year 2003 until year 2011. ▪ TLS size B3 had “Combustion Chamber Volume” similar with NLS size A1. Although the sold record in year 2011 showing that TLS size B3 has 20,502 of sold out less than 35,292 of TLS size B2 sold out . The verifier has accessed and reviewed the TLS and NLS specification to confirmed the CDM Analyst explanation as follows: <table><tr><th>NLS or TLS Size</th><th>Combustion Chamber Volume (cm³)</th></tr><tr><td>NLS size A1</td><td>2,240</td></tr><tr><td>TLS size B3</td><td>2,771</td></tr><tr><td>TLS size B2</td><td>3,612</td></tr></table> Therefore the HFCT has been done for the Traditional Lao Stove (TLS) size B3 and the New Lao Stove size A1 is reasonable. During site visit on 15/02/2012, the verifier had accessed to the Testing Result of HFCT in year 2011 and confirmed that the Raw Data has been transferred into the Calculation Spradsheets correctly.	NLS or TLS Size	Combustion Chamber Volume (cm ³)	NLS size A1	2,240	TLS size B3	2,771	TLS size B2	3,612		
NLS or TLS Size	Combustion Chamber Volume (cm ³)										
NLS size A1	2,240										
TLS size B3	2,771										
TLS size B2	3,612										

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl												
	2. Equipment Ratio & Stove Life Time The verifier had accessed to the SPSS of National User Survey in year 2011. It is confirmed that the sample size has been selected by the statistical method as explained in the monitoring report. The table of result in SPSS can be summarized as follows: <table><tr><th></th><th>Average months your previous NLS last</th><th>#NLS/family</th></tr><tr><td>N valid</td><td>395</td><td>716</td></tr><tr><td>Missing</td><td>1270</td><td>948</td></tr><tr><td>Mean</td><td>18.25</td><td>1.2249</td></tr></table> During site visit on 15/02/2012, the verifier had accessed to the 716 set of valid questionnaires. It is confirmed that the survey has been conducted in July 2011. It is confirmed that the questionnaires are included the following questions ✓ Previous and current stove use by refer to question in section B.1.2 and B.1.3 respectively ✓ The equipment ratio by refer to question in section B.3 (1) for NLS, B.3(2) for TLS and B.3(3) for other stove usage in houshold) The verifier has sampling and reviewed the questionnaires number 1624, 1628, 1629, 1637, 1639, 1641, 1642, 1643, 1644, 1645, 1192, 1193, 1194, 1195, 1620, 1515, 1517, 1518, 1519, 1521, 1523, 1527, 1529, 1531, 1535, 1538, 1539, 1511, 1512, 1508, 194, 190, 189, 1540, 269, 222, 1513. It is confirmed that all informations in the		Average months your previous NLS last	#NLS/family	N valid	395	716	Missing	1270	948	Mean	18.25	1.2249		
	Average months your previous NLS last	#NLS/family													
N valid	395	716													
Missing	1270	948													
Mean	18.25	1.2249													

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl																																			
	questionnaires have been transferred to Spredaheet and SPSS correctly and consistent with the SPSS Input Data. 3. POST 2008 The verifier had accessed and sampling to the “NLS Purchase Bill” and “NLS Sale Bill” in year 2011 of the “NLS Retailers” to ensure that the “53.4 days of Stove Shelf Life” that used to calculate the concept of time lapse production and stove utilization since year 2008 is still “Valid” and “conservative” in year 2011. The “NLS Purchase Bill”, “NLS Sale Bill” of the following NLS retailers have been accessed and reviewed and also trace back to the “Producer Sale Records” Retailer Name: Chear Roeun Middle Man who sold NLS: Bun Sumaly <table><tr><th>QC Label</th><th>Date of sold to end user</th><th>Date of bough from Midle Man</th><th>Date of bough from Producer</th><th>ProducerName</th></tr><tr><td>A 296074</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr><tr><td>A 296078</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr><tr><td>A 296058</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr><tr><td>A 296040</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr><tr><td>A 296083</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr><tr><td>A 296049</td><td>4/12/11</td><td>8/11/11</td><td>22/10/11</td><td>Dul Sam Oun</td></tr></table>	QC Label	Date of sold to end user	Date of bough from Midle Man	Date of bough from Producer	ProducerName	A 296074	4/12/11	8/11/11	22/10/11	Dul Sam Oun	A 296078	4/12/11	8/11/11	22/10/11	Dul Sam Oun	A 296058	4/12/11	8/11/11	22/10/11	Dul Sam Oun	A 296040	4/12/11	8/11/11	22/10/11	Dul Sam Oun	A 296083	4/12/11	8/11/11	22/10/11	Dul Sam Oun	A 296049	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
QC Label	Date of sold to end user	Date of bough from Midle Man	Date of bough from Producer	ProducerName																																		
A 296074	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		
A 296078	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		
A 296058	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		
A 296040	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		
A 296083	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		
A 296049	4/12/11	8/11/11	22/10/11	Dul Sam Oun																																		

CHECKLIST QUESTION	COMMENTS					Draft Concl	Final Concl
	A 296108	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296044	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296089	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296034	2/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296080	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296103	26/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296093	26/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296099	25/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296076	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296086	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296081	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296088	3/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296067	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296060	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296077	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296082	4/12/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296091	28/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296106	29/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296105	29/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296098	27/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296096	27/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296094	27/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 296111	29/11/11	8/11/11	22/10/11	Dul Sam Oun		
	A 122616	6/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122623	10/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122666	5/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122660	10/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122622	10/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122618	8/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122609	8/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122659	8/6/11	8/5/11	24/42011	Dul Sam Oun		
	A 122611	6/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122608	5/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 122612	3/6/11	8/5/11	22/4/11	Dul Sam Oun		
	A 145494	2/6/11	8/5/11	6/5/11	Dul Sam Oun		

CHECKLIST QUESTION	COMMENTS					Draft Concl	Final Concl
	A 145497	2/6/11	8/5/11	6/5/11	Dul Sam Oun		
	A 122620	31/5/11	8/5/11	22/4/11	Dul Sam Oun		
	A 145496	31/5/11	8/5/11	6/5/11	Dul Sam Oun		
	A 145493	29/5/11	8/5/11	7/5/11	Dul Sam Oun		
	A 145472	27/5/11	8/5/11	6/5/11	Dul Sam Oun		
	A 145495	25/5/11	8/5/11	6/5/11	Dul Sam Oun		
	Retailer Name: Soeng Soeun Middle Man who sold NLS: Sim Srun						
	QC Label	Date of sold to end user	Date of bough from Midle Man	Date of bough from Producer	ProducerName		
	A 352843	26/12/11	19/12/11	10/12/11	Phun Sophal		
	A 360173	26/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360219	26/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360210	26/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 336042	26/12/11	19/12/11	21/11/11	Keo chanthear		
	A 352871	26/12/11	19/12/11	10/12/11	Phun Sophal		
	A 352850	26/12/11	19/12/11	10/12/11	Phun Sophal		
	A 352857	26/12/11	19/12/11	10/12/11	Phun Sophal		
	A 352849	26/12/11	19/12/11	10/12/11	Phun Sophal		
	A 360184	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360195	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360214	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360160	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360211	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360162	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360263	27/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360187	26/12/11	19/12/11	9/12/11	Thon Chamrern		

CHECKLIST QUESTION	COMMENTS					Draft Concl	Final Concl
	A 360170	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360166	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360157	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 335999	25/12/11	19/12/11	21/11/11	Keo chanthear		
	A 336044	25/12/11	19/12/11	21/11/11	Keo chanthear		
	A 360207	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 336040	25/12/11	19/12/11	21/11/11	Keo Chanthear		
	A 360149	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360168	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360131	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360147	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360223	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360148	25/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360171	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360172	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360186	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360151	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360182	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360150	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 336061	24/12/11	19/12/11	21/11/11	Keo chanthear		
	A 360218	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 360185	24/12/11	19/12/11	9/12/11	Thon Chamrern		
	A 025216	11/2/11	10/2/11	13/11/11	DATE		
	A 040086	11/2/11	10/2/11	19/1/11	Dourng Saronn		
	A 026240	11/2/11	10/2/11	17/01/11	Khoem Tim		
	A 025166	11/2/11	10/2/11	13/11/11	DATE		
	A 025170	11/2/11	10/2/11	13/11/11	DATE		
	A 025175	11/2/11	10/2/11	13/11/11	DATE		
	A 025227	11/2/11	10/2/11	17/01/11	DATE		
	A 025229	11/2/11	10/2/11	17/01/11	DATE		
	A 025206	11/2/11	10/2/11	13/01/11	DATE		
	A 040115	11/2/11	10/2/11	19/1/11	Dourng Saronn		
	A 026232	11/2/11	10/2/11	17/01/11	Khoem Tim		
	A 026276	11/2/11	10/2/11	17/01/11	Khoem Tim		
	A 025189	11/2/11	10/2/11	13/01/11	DATE		

CHECKLIST QUESTION	COMMENTS					Draft Concl	Final Concl																				
	<table><tr><td>A 026262</td><td>11/2/11</td><td>10/2/11</td><td>17/01/11</td><td>Khoem Tim</td></tr><tr><td>A 025182</td><td>11/2/11</td><td>10/2/11</td><td>17/01/11</td><td>DATE</td></tr><tr><td>A 040098</td><td>12/2/11</td><td>10/2/11</td><td>19/1/11</td><td>Dourng Saronn</td></tr><tr><td>A 025221</td><td>12/2/11</td><td>10/2/11</td><td>17/01/11</td><td>DATE</td></tr></table> With reference to information above, the time that NLS have been sold from the producers until sold from the retailers to end users are “quite less than 53.4 days”. However the more informations should be record and interplete in year 2012 as the objective evidence for next verification period to absolutely ensure that the “53.4 days of Stove Shelf Life” that used to calculate the concept of time lapse production and stove utilization since year 2008 is still “Valid” and “conservative”. (Please refer to FAR2) 4. Number of stove sold The verifier had verified the number of stove sold by the following steps: Step 1: 100% cross checked between number of stove sold record in the Producer’s Log Book and the Emission Calculation Spreadsheet. Step 2: Cross checked the monthly data transferred from the Producer’s Log Book into the Emission Calculation Spreadsheet by select sampling from the producers who are the main contribute of NLS stove sold in year 2011. The results can be summarized as follows:					A 026262	11/2/11	10/2/11	17/01/11	Khoem Tim	A 025182	11/2/11	10/2/11	17/01/11	DATE	A 040098	12/2/11	10/2/11	19/1/11	Dourng Saronn	A 025221	12/2/11	10/2/11	17/01/11	DATE		
A 026262	11/2/11	10/2/11	17/01/11	Khoem Tim																							
A 025182	11/2/11	10/2/11	17/01/11	DATE																							
A 040098	12/2/11	10/2/11	19/1/11	Dourng Saronn																							
A 025221	12/2/11	10/2/11	17/01/11	DATE																							

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl																												
	Producer in Kampong Chhnang <table> <tr> <th>Producers</th><th>Month & Number of Stove Sold that transferred into Spreadsheet</th><th>Original sold record in the Producer's Log Book</th><th>% Error</th></tr> <tr> <td>Vann Tola</td><td>Sep (5,574) Apr (5,323) Nov (6004)</td><td>Sep (5,574) Apr (5,323) Nov (6,004)</td><td>0 0 0</td></tr> <tr> <td>Sun Tha</td><td>Jan (1,027) Apr (1,136) Oct (1472)</td><td>Jan (1,027) Apr (1,136) Oct (1,472)</td><td>0 0 0</td></tr> <tr> <td>Dul Sam Oun</td><td>Jan (2,824) Jul (2,761) Oct (2348)</td><td>Jan (2,824) Jul (2,761) Oct (2,348)</td><td>0 0 0</td></tr> <tr> <td>Khoem Tim</td><td>Mar (1,332) Jun (2,066) Oct (2,300)</td><td>Mar (1,332) Jun (2,066) Oct (2,300)</td><td>0 0 0</td></tr> <tr> <td>Sim Sour</td><td>Jan (1,677) May (1,695) Nov (1,875)</td><td>Jan (1,677) May (1,695) Nov (1,875)</td><td>0 0 0</td></tr> <tr> <td>Phun Sophal</td><td>Feb (2,448) Jun (1,383) Dec (3,583)</td><td>Feb (2,448) Jun (1,383) Dec (3,583)</td><td>0 0 0</td></tr> </table>	Producers	Month & Number of Stove Sold that transferred into Spreadsheet	Original sold record in the Producer's Log Book	% Error	Vann Tola	Sep (5,574) Apr (5,323) Nov (6004)	Sep (5,574) Apr (5,323) Nov (6,004)	0 0 0	Sun Tha	Jan (1,027) Apr (1,136) Oct (1472)	Jan (1,027) Apr (1,136) Oct (1,472)	0 0 0	Dul Sam Oun	Jan (2,824) Jul (2,761) Oct (2348)	Jan (2,824) Jul (2,761) Oct (2,348)	0 0 0	Khoem Tim	Mar (1,332) Jun (2,066) Oct (2,300)	Mar (1,332) Jun (2,066) Oct (2,300)	0 0 0	Sim Sour	Jan (1,677) May (1,695) Nov (1,875)	Jan (1,677) May (1,695) Nov (1,875)	0 0 0	Phun Sophal	Feb (2,448) Jun (1,383) Dec (3,583)	Feb (2,448) Jun (1,383) Dec (3,583)	0 0 0		
Producers	Month & Number of Stove Sold that transferred into Spreadsheet	Original sold record in the Producer's Log Book	% Error																												
Vann Tola	Sep (5,574) Apr (5,323) Nov (6004)	Sep (5,574) Apr (5,323) Nov (6,004)	0 0 0																												
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CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl																																															
	Producer in Battambang <table> <tr> <th>Producers</th><th>Month & Number of Stove Sold that transferred into Spreadsheet</th><th>Original sold record in the Producer's Log Book</th><th>% Error</th></tr> <tr> <td rowspan="3">Khin Pum</td><td>Feb (336)</td><td>Feb (336)</td><td>0</td></tr> <tr> <td>Nov (404)</td><td>Nov (404)</td><td>0</td></tr> <tr> <td>Dec (428)</td><td>Dec (428)</td><td>0</td></tr> <tr> <td rowspan="4">Leng Sophat</td><td>Mar (746)</td><td>Mar (746)</td><td>0</td></tr> <tr> <td>May (616)</td><td>May (616)</td><td>0</td></tr> <tr> <td>Dec (514)</td><td>Dec (514)</td><td>0</td></tr> <tr> <td>Jul (411)</td><td>Jul (411)</td><td>0</td></tr> <tr> <td rowspan="3">Neck Sakun</td><td>Mar (648)</td><td>Mar (648)</td><td>0</td></tr> <tr> <td>Jun (1258)</td><td>Jun (1258)</td><td>0</td></tr> <tr> <td>Sep (1087)</td><td>Aug (1087)</td><td>0</td></tr> <tr> <td rowspan="3">Sorphy</td><td>Feb (30)</td><td>Feb (30)</td><td>0</td></tr> <tr> <td>Jun (108)</td><td>Jun (108)</td><td>0</td></tr> <tr> <td>Jul (112)</td><td>Jul (112)</td><td>0</td></tr> </table> With reference to both two step of verification. It is confirmed that Number of stove sold that used to calculate the Emission Reduction on the Spreadsheet have been transferred from the Producer's Log Book cotrectly.	Producers	Month & Number of Stove Sold that transferred into Spreadsheet	Original sold record in the Producer's Log Book	% Error	Khin Pum	Feb (336)	Feb (336)	0	Nov (404)	Nov (404)	0	Dec (428)	Dec (428)	0	Leng Sophat	Mar (746)	Mar (746)	0	May (616)	May (616)	0	Dec (514)	Dec (514)	0	Jul (411)	Jul (411)	0	Neck Sakun	Mar (648)	Mar (648)	0	Jun (1258)	Jun (1258)	0	Sep (1087)	Aug (1087)	0	Sorphy	Feb (30)	Feb (30)	0	Jun (108)	Jun (108)	0	Jul (112)	Jul (112)	0		
Producers	Month & Number of Stove Sold that transferred into Spreadsheet	Original sold record in the Producer's Log Book	% Error																																															
Khin Pum	Feb (336)	Feb (336)	0																																															
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CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
c. Have calculations of baseline emissions, proposed project emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	The verifier had accessed to the EXCEL files of “ Emission Calculation Spreadsheet and NLS Data Base Jan 1st – Dec 31st 2011 version 1 ” and found that the Emission Reduction calculation has been calculated by the following steps:	CAR1	OK
		CAR2	OK
		CL4	OK
		CL5	FAR2
		CL6	OK

Parameters	Calculation Equation
Emission Reduction	(Baseline Emission – 15% of leakage deduction) – Transport Emission
Baseline Emission	Total Biomass Saving x NCV of Biomass x Emission Factor of Biomass
Total Biomass Saving	Wood Saving + Charcoal Saving
Wood Saving	Wood Usage x 20.89% of Wood Saving by Household Cooking Test (Please refer to CL 1.2)
Charcoal Saving	Charcoal Usage x 21.12% of Charcoal Saving by Household Cooking Test (Please refer to CL 1.2)
Wood Usage	(Number of Stove units in use ÷ 1.23 of equipment ratio) x (Traditional Wood Consumption) (Please refer to CL 4 in case of 1.23 of equipment ratio) (Please refer to CL 1.1 in case of Traditional Wood Consumption)
Charcoal Usage	(Number of Stove units in use ÷ 1.23 of equipment ratio) x (wood to charcoal ratio) x (Traditional Charcoal Consumption) (Please refer to CL 4 in case of 1.23 of equipment ratio) (Please refer to CL 1.1 in case of Traditional Charcoal Consumption)

CHECKLIST QUESTION	COMMENTS		Draft Concl	Final Concl
		<i>(Please refer to CAR1 for Traditional Charcoal Consumption)</i>		
	Number of Stove units in use each month	Number of Stove units in use last month – Number of unit retired last month + ((1-A) x Number of Stove units sold last month) + (A x Number of Stove units sold last two month <i>(Please refer to CL 5)</i>		
	Number of unit retired	Number of Stove units sold last 18 month. The verifier found that the number of unit retired in JANUARY 2011 that showed in Emission Reduction Spreadsheet is not referred to the number of Stove units sold last 18 month. <i>(Please refer to CL 6)</i> <i>(Please refer to CL3 in case of 18 months or 1.5 years of Stove Lifetime)</i>		
	Number of Stove units sold	Stove sold to the Middle Man + Stove sold to the End User. The verifier found that Number of Stove units sold that showed in Emission Reduction Spreadsheet in each month is not calculated by monthly summation. For example: - Number of Stove units sold in January 2011 is calculated by SUM ('NLS 1st jan - 31st Dec 2011'!E2:E1749)+SUM('NLS 1st jan - 31st Dec 2011'!H2:H1749). - As refer to page “NLS 1st jan - 31st Dec 2011” in the Spreadsheet. The ROW is not categorized by Monthly Basis.		

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	Therefore the row number 2 to 1749 is not the number of Stove units sold in January 2011 but it is the mix of three producers. <i>(Please refer to CAR2)</i> CAR1: <i>The number of Traditional Charcoal Consumption that calculated in the Emission Reduction Spreadsheet version 1 is not “conservative” because of it is not converted into tones per month by link from cell of kilogram per month directly.</i> CAR2: <i>The number of stove units sold in each month that used to calculate emission reduction on EXCEL sheet is linked to NLS sold data which is not represent the monthly basis.</i> CL4: <i>Please clarify why the equipment ratio (1.23) shall be included in the equation of Wood and Charcoal usage estimation in the Emission Calculation Spreadsheet.</i> CL5: <i>Please clarify</i> 5.1 <i>What is the concept of time lapse production and stove utilization calculation or POST Time that showed in spreadsheet.</i>		

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	5.2 What is the meaning of "A" that calculated by $[53.4 \text{ days of Stove Shelf Life} - (365/12)/(365/12)]$ 5.3 Why "A" and "1-A" shall be considered into the Number of Stove units in use calculation 5.4 How to confident that "53.4 days of Stove Shelf Life" that used to calculate the concept of time lapse production and stove utilization since year 2008 is still "conservative" in year 2011 CL6: Please clarify why the number of unit retired in JANUARY 2011 that showed in the Emission Reduction Spreadsheet version 1 has been calculated by $[\text{number of unit sold in JULY 2009} + (\text{summation of number of unit sold in AUGUST 2008 to JUNE 2009})]$. It is not referred to Number of Stove units sold last 18 month.		
d. Have any assumptions used in emission calculations been justified?	No.	OK	OK
e. Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	Yes. IPCC has been referred in case of Net Calorific Value (NCV), Emission Factor (EF) of biomass and Wood to Charcoal Ratio.	OK	OK

Table 2: Resolution of Corrective Action / Forward Action / Clarification Requests.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CAR1: The number of Traditional Charcoal Consumption that calculated in the Emission Reduction Spreadsheet version 1 is not “conservative” because of it is not converted into tones per month by link from cell of kilogram per month directly.	4c	<u>GERES (06/02/2012)</u> The tonnes/ month cell is simply the kg/ month cell multiplied by 1000, so it is exactly the same number and therefore equally conservative.	<u>BVCH (08/02/2012)</u> The verifier had accessed to the Emission Reduction Spreadsheet version 2 and found that the number “0.0321217272656101” in ton/month is input to cell of Traditional Charcoal Consumption directly. Therefore the “Emission Reduction” is “349,367 tones of CO_{2e}”. The verifier had verified the calculation algorithm on spreadsheet and found that in case of the Traditional Charcoal Consumption in ton/month is calculated by link to the Traditional Charcoal Consumption in kg/month on EXCEL sheet and divided by “1,000 kg/ton”, the emission reduction is “349,352 tones of CO_{2e}”. It is lower than the first method as comparison table below:

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion						
			<table><tr><th>Traditional Charcoal Consumption (ton/month)</th><th>Emission Reduction (tones of CO_{2e})</th></tr><tr><td>0.0321217272656101</td><td>349,367</td></tr><tr><td>Calculated by link to the Traditional Charcoal Consumption in kg/month on EXCEL sheet and divided by “1,000 kg/ton”</td><td>349,352</td></tr></table> <u>BVCH (21/02/2012)</u> The project proponent Emission Reduction Spreadsheet version 2 has been revised into version 3. The calculation algorithm on spreadsheet has been changed in case of the Traditional Charcoal Consumption in	Traditional Charcoal Consumption (ton/month)	Emission Reduction (tones of CO _{2e})	0.0321217272656101	349,367	Calculated by link to the Traditional Charcoal Consumption in kg/month on EXCEL sheet and divided by “1,000 kg/ton”	349,352
Traditional Charcoal Consumption (ton/month)	Emission Reduction (tones of CO _{2e})								
0.0321217272656101	349,367								
Calculated by link to the Traditional Charcoal Consumption in kg/month on EXCEL sheet and divided by “1,000 kg/ton”	349,352								

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			ton/month by link to the Traditional Charcoal Consumption in kg/month on EXCEL sheet and divided by “1,000 kg/ton”. Therefore the emission reduction is reduced to be “349,352 tones of CO_{2e}”. The Monitoring Report 1st Jan – 31st Dec 2011 is also revised the emission reduction to be 349,352 tones of CO_{2e} in line with the Emission Reduction Calculation Spreadsheet version 3. <i>Hence the response is satisfactory.</i> <i>The CAR1 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>

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CAR2: The number of stove units sold in each month that used to calculate emission reduction on EXCEL sheet is linked to NLS sold data which is not represent the monthly basis.	4c	<u>GERES (06/02/2012)</u> This is an error due to sorting of the data in the worksheet “NLS 1st Jan - 31st Dec 2011” after filling the formulae in the worksheet “Summary 2003-2011”. The problem has been rectified and the correct version of the emissions reduction calculation spreadsheet is attached (see MS Excel file “NLS database Jan 1st - Dec 31st 2011.v2”). The total number of stoves sold does not change; only the distribution of the sales through out the year changes (which slightly reduces the number of emissions reductions claimed).	<u>BVCH (08/02/2012)</u> With reference to the Emission Reduction Spreadsheet version 2. It is confirmed that an error due to sorting of the data in the worksheet “NLS 1st Jan - 31st Dec 2011” has been corrected. The verifier found that the emission reduction that demonstrated in the Emission Reduction Spreadsheet version 2 is “349,367 tones of CO_{2e}”. It is reduced from “349,410 tones of CO_{2e}” that demonstrated in the last version. Remark: <i>The Monitoring Report 1st Jan – 31st Dec 2011 is version 5 dated 21/02/2012 was submitted to the verifier on 21/02/2012 after CAR1 is closed. The emission reduction is revised to be</i>

Draft report clarifications and corrective action requests by verification team			Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
					349,352 tones of CO_{2e} in line with the Revised Emission Reduction Calculation Spreadsheet version 3. Hence the response is satisfactory. The CAR2 was closed based on adequate responses from the Project Proponent which meet the applicable requirements.
CL1: Please clarify how to compare the results of “Household Fuel Consumption Test (HFCT)” with the Table 2 of the “Monitoring Report 1 st January – 31 st December 2011 version 3” in case of			3b ii	<u>GERES (06/02/2012)</u> The values used in the PDD are from HFCTs and a baseline survey conducted in 2006 (see attached documents “Rainy dry season HFCT”, which are the HFCTs that gave the 20.89% and 21.20% fuel savings; and “SB07 04 17Fuelmixdoc ver2”, which is the baseline survey that gave the 37.56kg and 32.12kg baseline fuel	<u>BVCH (08/02/2012)</u> The verifier had accessed to the data base of “Rainy dry season HFCT” and “SB07 04 17Fuelmixdoc ver2”. It is confirmed that the fuel saving are 20.89% and 21.20% in case of wood and charcoal respectively and the fuel consumption are 37.56 and 32.12 kg/month in case of wood and charcoal respectively.
Item	Household Fuel Consumption Test (HFCT)	Monitoring Report 1 st Jan – 31 st Dec 2011 version 3			
1.1	Wood and charcoal consumption for Traditional Laos Stove	Traditional Fuel Consumption (37.56 and 32.12 kg/month for wood and charcoal respectively)			

Draft report clarifications and corrective action requests by verification team			Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion														
1.2	The testing results in term of “Fuel (wood and charcoal) Saving” during wet and dry season	The Fuel Saving (20.89 and 21.20% for wood and charcoal respectively)		consumption). During the validation/ first verification (conducted by the DOE Det Norske Veritas in 2007), the DOE advised GERES to use the original fuel saving figures in the PDD for all future emissions reduction calculations, in order to maintain consistency. Therefore, all subsequent HFCTs are simply used to validate that the figures used in the PDD (and the emissions reduction calculation spreadsheet) are still relevant.	The verifier had accessed to the EXCEL files of “Household Fuel Consumption Test (HFCT)” cover both wet and dry seasons. The testing results in term of “Fuel Saving” is cover the wood and charcoal as follows: <table><tr><th rowspan="2">Season</th><th colspan="2">Fuel Saving (%)</th></tr><tr><th>Wood</th><th>Charcoal</th></tr><tr><td>Wet</td><td>20.05</td><td>19.74</td></tr><tr><td>Dry</td><td>23.59</td><td>26.88</td></tr><tr><td>Average</td><td>21.82</td><td>23.31</td></tr></table> With reference to the average fuel saving for wood and charcoal in year 2011. It is showing that the testing results are more saving than the value that used to calculate the emission reduction in year 2011. Therefore 20.89 and 21.20% of fuel saving for wood and charcoal respectively are still conservative for emission reduction in year 2011. Hence the response is satisfactory.	Season	Fuel Saving (%)		Wood	Charcoal	Wet	20.05	19.74	Dry	23.59	26.88	Average	21.82	23.31
Season	Fuel Saving (%)																		
	Wood	Charcoal																	
Wet	20.05	19.74																	
Dry	23.59	26.88																	
Average	21.82	23.31																	

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			<i>The CL1 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>
CL2: Please clarify why the results of moisture content of the biomass is not included in the Monitoring Report 1 st January – 31 December 2011 version 3.	3b ii	<u>GERES (06/02/2012)</u> Since the fuel saving values used in the emission reduction calculations are based on field tests rather than laboratory tests, the moisture content of the fuel is not relevant. The fuel saving values used in our calculations reflect the real situation in the field – therefore the moisture content of the fuel is automatically taken into account during the testing. In terms of seasonal variations in moisture content, this is incorporated by the fact that we conduct HFCTs during	<u>BVCH (08/02/2012)</u> The verifier had reviewed the response from the Project Proponent and related documents. It is acceptable. <i>Hence the response is satisfactory.</i> <i>The CL2 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		both the dry and rainy seasons. Humidity of wood is checked only for the purpose of ensuring the moisture content for NLS and TLS HFCTs is comparable. Moisture content for charcoal is usually more uniform – differences in wood species provides scopes for greater discrepancy in moisture content.	
CL3: Please provide all information and objective evidences to explain that how the raw data was interpreted into the 1.5 years of Stove Lifetime.	3b ii	<u>GERES (06/02/2012)</u> The raw data was obtained through the National Users Survey, conducted by GERES in August 2011. In the survey, households that have owned NLS in the past and who own an NLS currently were asked how long the NLS lasts for. The data for this response (and all other data obtained during the survey) was entered into a database	<u>BVCH (08/02/2012)</u> The SPSS is provided. The verifier will cross checking the SPSS data with the raw data (questionnaires) at GERES Office during site visit on 13-15/02/2012. CL3 is still opened.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		using the software SPSS Statistics 17.0. This software allows analysis of individual questions and produces outputs expressing this analysis. See the attached document “SPSS_National User Survey_Stove Lifetime” for the SPSS output for NLS lifetime obtained during the National User Survey. In case your computer does not support the SPSS software, the results have been converted into a PDF document – please see attached document “PDF conversion_SPSS_National User Survey_Stove Lifetime”.	<u>BVCH (15/02/2012)</u> During site visit on 15/02/2012, the verifier has sampling and reviewed the questionnaires number 1624, 1628, 1629, 1637, 1639, 1641, 1642, 1643, 1644, 1645, 1192, 1193, 1194, 1195, 1620, 1515, 1517, 1518, 1519, 1521, 1523, 1527, 1529, 1531, 1535, 1538, 1539, 1511, 1512, 1508, 194, 190, 189, 1540, 269, 222, 1513. It is confirmed that all informations in the questionnaires have been transferred to Spredaheet and SPSS correctly and consistent with the SPSS Input Data. <i>Hence the response is satisfactory.</i> <i>The CL3 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CL4: Please clarify why the equipment ratio (1.23) shall be included in the equation of Wood and Charcoal usage estimation in the Emission Calculation Spreadsheet.	4c	<u>GERES (06/02/2012)</u> The equipment ratio represents the average number of stoves per household. The equipment ratio is important because the fuel saving for the project is calculated on a per household basis, <u>not</u> a per stove basis and some households have more than one NLS. If we multiplied the fuel saving (per household) by the total number of stoves, we would over-estimate the emissions reductions generated. This is why we must divide by the equipment ratio.	<u>BVCH (08/02/2012)</u> The verifier had accessed to the Emission Calculation Spreadsheet version 2 and found that wood and charcoal usage are calculated as follows: <u>Wood usage:</u> = (Number of Stove units in use ÷ 1.23 of equipment ratio) x (Traditional Wood Consumption) <u>Charcoal usage:</u> (Number of Stove units in use ÷ 1.23 of equipment ratio) x (wood to charcoal ratio) x (Traditional Charcoal Consumption) With reference to equations above, the equipment ratio is lead to more conservative in both wood and charcoal usage values. Therefore the Project Proponent's clarification is cleared.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			<u>BVCH (15/02/2012)</u> The reliable of equipment ratio value has been verified during site visit on 15/02/2012. It is confirmed that all informations in the questionnaires have been transferred to Spreadaheet and SPSS correctly and consistent with the SPSS Input Data. <i>Hence the response is satisfactory.</i> <i>The CL4 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>
CL5: Please clarify 5.1 What is the concept of time lapse production and stove utilization calculation or POST Time that showed in spreadsheet.	4c	<u>GERES (06/02/2012)</u> 5.1 The POST time represents the time lapse between point of sale from producer to middleman/ retailer and point of sale from middleman/ retailer to user. During this time (before the user buys the stove), the	<u>BVCH (08/02/2012)</u> <CL5.1, 5.2 and 5.3> The verifier had reviewed the “EBY_09July04_POST time explanation_KB review_v1” and confirms that the concept of concept of

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
5.2 What is the meaning of "A" that calculated by $[53.4 \text{ days of Stove Shelf Life} - (365/12)/(365/12)]$ 5.3 Why "A" and "1-A" shall be considered into the Number of Stove units in use calculation 5.4 How to confident that "53.4 days of Stove Shelf Life" that used to calculate the concept of time lapse production and stove utilization since year 2008 is still "conservative" in year 2011		stove is not being used and therefore not generating emissions reductions. This is why we need to delay the time at which we start counting emissions reductions – this delay is technically the POST. In order to be extra conservative, however, we consider the POST to start on the date that GERES issues QC labels to the NLS producers. This means the actual POST time that we apply is longer (because NLS producers may take some days to actually place the QC labels on the stoves and sell them to middlemen/ retailers) and hence delays the time at which we start counting emissions reductions from the NLS sold. 5.2 Please see attached document, file name "EBY_09July04_POST	time lapse production and stove utilization calculation is "logical" and consistent with the Project Proponent's explanation. Therefore the CL5 item 5.1, 5.2 and 5.3 is now closed. <CL5.4> With reference to the response from the project proponent. It can be "accepted in principle" that the POST 2008 has been design based on "the conservative approach". However this explanation could not referred as "the objective evidence" to ensure that "53.4 days of Stove Shelf Life" is

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		time explanation_KB review_v1" 5.3 Please see attached document, file name "EBY_09July04_POST time explanation_KB review_v1" 5.4 It is unlikely that the POST time would increase, since every player in the NLS supply chain has a vested interest to minimise the POST time. Producers and middlemen/ retailers want to reduce POST time in order to realise a return on their initial investment as quickly as possible; and end users want to reduce POST time in order to minimise the price paid for a stove (the further down the supply chain the stove is purchased, the higher the cost of the stove). It would therefore be very unlikely to	still "conservative" in year 2011 because of it has been justified base on the "indirect information" and it is not "Ex-post". The verifier will cross checking the actual Stove Shelf Life during site visit on 13-15/02/2012. CL5 item 5.4 is still opened. <u>BVCH (15/02/2012)</u> The verifier had accessed and sampling to the "NLS Purchase Bill" and "NLS Sale Bill" in year 2011 of the "NLS Retailers" and found that the time that NLS have been sold from the producers until sold from the retailers to end users are "quite less than 53.4 days". However the more informations should be record and interplete in year 2012 as

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		see a market evolution that would increase the POST time compared to 2008. In addition, roads and other infrastructure in Cambodia have improved considerably since 2008, which would further reduce time required to transport stoves. Furthermore, stove sales have consistently increased since 2008; and because NLS producers generally lack space to store stoves, they need to sell them as quickly as possible, which further indicates that the POST is unlikely to have increased. Also, the NLS team's continuous coaching about stock management during monitoring and QC visits means that the POST time is	the objective evidence for next verification period to absolutely ensure that the "53.4 days of Stove Shelf Life" that used to calculate the concept of time lapse production and stove utilization since year 2008 is still "Valid" and "conservative". <i>The CL5 is now closed by raise FAR2 to follow up in the next verification period.</i>

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		unlikely to have increased. The NLS team advise NLS producers on moving old stock first, effective use of QC labels (taking care not to misplace them and applying them in a sequential manner so that old labels are not sitting around for a long time, which would extend the POST time). Finally, it is important to note that the POST time calculated is already very conservative because: • It includes the time lapse between the point at which the producers obtain the QC label and the point at which the producers label the produced stove. Producers generally apply labels in batches, rather than on a stove-by-stove basis, which means the delay between receiving and issuing the label could be in the order of weeks (since labels are issued	

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		monthly). • Extreme POST data was included in the calculation. The extreme values may result from a number of situations, such as misplacement of the labels by producers, or using new batches of labels before using leftover labels from the previous month. • It is not discounted for sales closer to the point of production	
CL6: Please clarify why the number of unit retired in JANUARY 2011 that showed in the Emission Reduction Spreadsheet version 1 has been calculated by [number of unit sold in JULY 2009 + (summation of number of unit sold in AUGUST 2008 to JUNE 2009)]. It is not referred to Number of Stove units sold last 18 month.	4c	<u>GERES (06/02/2012)</u> The number of units retired is based on the stove lifetime. The 2011 National User Survey found that the NLS lifetime is 1.5 years (according to respondents' estimates). Previously, the lifetime was 2.5 years. The reduction in lifetime means that we have to retire stoves earlier (after 1.5 years instead of 2.5 years). So stoves produced in July	<u>BVCH (08/02/2012)</u> The verifier had accessed to the Emission Calculation Spreadsheet version 2 and found that the number of unit retired during "1 to 31 December 2010" is referred to number of unit sold during "10 July to 9 August 2008" or "last 29 months (2 years and 5 months ago)". In year 2011, the project proponent clarify that "the Stove Lifetime" is reduced to be "1.5 years or 18

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		2009 were 1.5 years old in January 2011, so they needed to be retired in January 2011. Similarly, stoves produced in August 2009 were one 1.5 years old in February 2011, so they needed to be retired in February 2011, etc. etc. But what about stoves produced from August 2008 – June 2009? Do we apply the 2.5 or 1.5 years lifetime to those stoves? In order to be conservative we applied the 1.5 years lifetime to those stoves; we assumed that they were already broken (retired) in January 2011, so we immediately deducted them from our calculations in January 2011 so that those stoves were not generating emissions reductions during 2011.	months” that will be started to implement in January 2011. That means the number of unit retired in January, February, ..., December 2011 shall be referred to the number of unit sold in July 2009, August 2009, ..., June 2010 respectively to comply with concept of last 18 months of stove lifetime. However the project proponent also include the number of unit sold during “August 2008 to June 2009” to be the number of unit retired in “January 2011” to keep the “Conservative” approach. <i>Hence the response is satisfactory.</i> <i>The CL6 is now closed based on adequate responses from the Project Proponent which meet the applicable requirements.</i>

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
FAR1: The boiling test in year 2012 should be conducted in size A_0 and A_4 for some producers who have the 1 st and 2 nd rank in sold record in each size.	3e		
FAR2: 2.1 The retailer's record of NLS purchased and sold should be more implemented as possible. The retailer's competency and awareness should be improved to ensure that the NLS purchased and sold will be recorded correctly and continuously. 2.2 The retailer's record of NLS purchased and sold in year 2012 should be interpreted and cross checked with " 53.4 days of Stove Shelf Life " to ensure that it is still valid and conservative to calculate the Emission Reduction in Year 2012.	4c		