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# VERIFICATION / CERTIFICATION REPORT

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## CLEAN AND EFFICIENT COOKING AND HEATING PROJECT, CHINA

(Gold Standard Id No: GS949)

Monitoring Period:  
1 March 2009 to 30 September 2010

Report No. 2011-9203

REVISION No. 01

DET NORSKE VERITAS



## VERIFICATION / CERTIFICATION REPORT

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Approved by: Miguel Rescalvo Santandreu Regional Manager- Americas	Organisational unit: DNV Climate Change and Environmental Services
Client: Impact Carbon and My Climate	Client ref.: Evan Haigler Jimmy H. Tran

DNV CLIMATE CHANGE  
SERVICES AS

Veritasveien 1,  
1322 HØVIK, Norway  
Tel: +47 67 57 99 00  
Fax: +47 67 57 99 11  
http://www.dnv.com  
Org. No: NO 994 774 352 MVA

**Summary:**  
DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the “Clean and Efficient Cooking and Heating Project, China” (Gold Standard Ref. No. GS949) for the period 1 March 2009 to 30 September 2010.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (Version 04) of 24 April 2011 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the GS approved monitoring methodology “Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes” (version 0.02) and the monitoring plan contained in the Project Design Document of 1 April 2011.

DNV Climate Change Services AS is able to certify that the emission reductions from the “Clean and Efficient Cooking and Heating Project, China” during the period 1 March 2009 to 30 September 2010 amount to 50 390 tonnes of CO<sub>2</sub> equivalent.

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Work carried out by: Shruthi Poonacha, Gloria Godinez, Hun Nan, Astakala Vidyacharan		
Work verified by: Weidong Yang		
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### ***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GS	Gold Standard
HH	Household
IPCC	Intergovernmental Panel on Climate Change
KPT	Kitchen Performance Test
KT	Kitchen Test
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential



## 1 INTRODUCTION

Impact Carbon and My Climate have commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of emission reductions reported for the “Clean and Efficient Cooking and Heating Project, China” (the project) in the period 1 March 2009 to 30 September 2010. This report contains the findings from the verification and a certification statement for the certified emission reductions.

### 1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Clean and Efficient Cooking and Heating Project, China” for the period 1 March 2009 to 30 September 2010.

### 1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

### 1.3 Description of the project activity

Title of project activity:	Clean and Efficient Cooking and Heating Project, China
Gold Standard ID No:	GS949
Baseline and monitoring methodology	GS approved monitoring methodology “Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes” (version 0.02)
Project Entity:	Impact Carbon, 182 2nd Street, Suite 400, San Francisco, CA 9410, Ph no: +1 (415) 968-908, email id: <a href="mailto:info@impactcarbon.org">info@impactcarbon.org</a>



My Climate, Strenenstrase 12 8002 Zurich, Switzerland,  
8002 Zurich, Ph no: +41(0) 44 500 4350, Fax +41 (0) 44  
500 4351, E-Mail: [info@myclimate.org](mailto:info@myclimate.org)

Location of the project activity: Shanxi Province, China  
Project's crediting period: 1 March 2009 to 31 December 2015  
Period verified in this verification: 1 March 2009 to 30 September 2010

#### **1.4 Methodology for determining emission reductions**

The methodology used for the estimation of the emission reduction is in lines with the GS approved methodology, "Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes", V.02., 2 August 2010.

The project participant has estimated the baseline coal consumption in the region of Shanxi using Kitchen Performance Test (KPT) (2.83 tcoal/HH-year)/1//6/. After the implementation of the project activity, HH use the Jinqilin stove and biomass as fuel. Locals use coal in the heating month which is for a period of 4.4 months. The project proponent has conservatively assumed that in winter, all HH use only coal for cooking and heating and no biomass is used. The coal consumption for the project activity is estimated to be 1.04 tcoal/HH-year. The coal saving from each HH is 1.79 tcoal/HH-year. The coal savings is applicable for the Shanxi region and for the Jinqilin stoves model 80 and 80I. The emission reduction is calculated based on the number of stoves sold, coal saving per stove and usage of stove.

During future verifications, the project participants need to demonstrate that the new households added meet the specifications of the PDD particularly 'coal as predominant fuel for cooking'. If kitchen surveys show different fuel mix where large amount of biomass is consumed as cooking fuel then a new cluster shall be formed and new baseline shall be established and validated.

Post-registration Changes requiring the creation of new clusters that were not described in the original PDD must attain formal authorization following the Requirements of the Gold Standard Procedures For Approval of Design Changes 28/12/2010. Specific authorization is provided to include:

- Household biomass cooking and heating stoves manufactured by companies other than Jinqilin
- Institutional biomass cooking and heating stoves manufactured by companies other than Jinqilin
- Other improved cooking and heating technologies that displace baseline coal consumption

The above requirements have been described in detail as forward action requests in Appendix A.

## **2 METHODOLOGY**

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:



- Review of project documentation /1//2//5//6/;
- On-site inspections, including the review of performance records, interviews with project participants, observation of collection of measurements, established practices and testing of the accuracy of monitoring equipment/5//10/;
- Review of monitoring results and verification of the correct application of the monitoring methodologies/2/;

**Verification team***Type of involvement*

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Desk review</i>	<i>Site visit / Interviews</i>	<i>Reporting</i>	<i>Supervision of work</i>	<i>Technical review</i>
Project manager/GHG auditor	Bachamanda	Shruthi	USA	√		√	√	
Technical reviewer	Yang	Weidong	USA					√
Sector expert/CDM verifier	Vidyacharan	Astakala	India	√		√		
GHG auditor with sectoral competence	Godinez	Gloria	Mexico	√	√			
GHG auditor	Nan	Hu	China	√	√			

**Duration of verification**

Preparations: 11 October 2010 - 12 November 2010

On-site verification: 17 November 2010 - 20 November 2010

Reporting, calculation checks and QA/QC: 1 February 2011 – 3 May 2011

**2.1 Review of documentation**

This is the first verification for the project. This verification was conducted in parallel with the validation phase for the retroactive crediting period. The desk review was conducted prior to the site visit. The verification has been performed based on the review of the following documentation:

- The monitoring report /2/
- The PDD, including the monitoring plan /1/
- The approved baseline and monitoring methodology applied by the project /16/
- The usage survey report for ages 0-1 years and 1-2 years //5/
- Kitchen survey conducted to determine the baseline fuel usage and type of cook stove used /6/
- Kitchen Performance Test conducted to determine the amount of coal and biomass consumed per household per day /6/
- Training Records /9/



- Sales Records /10/

During the desk review, DNV has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, sampling plan for survey and the quality assurance and quality control procedures; and
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

## 2.2 Site visit

Follow up interviews were conducted on 17 – 20 November 2010 in Yangquan, Xiaohu, Shuilingdi and Zhongbei (Shanxi Province, China). These interviews are summarized in Table 1. A single site visit was conducted for the validation and verification of the project activity. The interview questions addressed issues concerned to the design, implementation and monitoring phase of the project activity.

**Table 1: Summary of the site visit interview**

Date	Name	Organization	Topic
<i>18/11/10</i>	Han wenping	Shanxi Jinqilin Energy Technology Company Ltd.	➤ Sampling questionnaires in the households of Xiaohu village.
			➤ Status of the implementation of the project activity
			➤ Technology of the cook stoves (certification)
			➤ Cook stoves models
<i>19/11/10</i>	Chen Xiaofu	China Association of Rural Energy Industry (CAREI)	➤ Residual biomass availability
			➤ Specifications of the cook stoves
			➤ Baseline: Coal consumption for cooking
			➤ Sampling questionnaires in the households of Shuilingdi and Zhongbei village.
<i>19/11/10</i>	Han wenping	Shanxi Jinqilin Energy Technology Company Ltd.	➤ Confirmation of the Sustainable development matrix results
			➤ Technology of the cook stoves (certification)
			➤ Cook stoves models
			➤ Specifications of the cook stoves
<i>19/11/10</i>	Chen Xiaofu	China Association of Rural Energy Industry (CAREI)	➤ Which is the most common stove?
			➤ Information flows for generating, aggregating and reporting the



			monitoring parameters
			➤ Cross verification of data from other sources such as plant log books, inventories, purchase records
<b>20/11/10</b>	Wang Haisheng	The leader of Changchi Yu county. (Local official)	✓ Meeting with Local official and local department representative
	Liang Yuliang	Business Association of Yu county	✓ Original document checking
	Yang Nengjuan	Board of health of Yu county	✓ Interview Shanxi Jinqilin Energy Technology Company Ltd..
	Pang Nengfang	Woman's association of Yu county	Monitoring Plan and monitoring procedures
	Zhang Yongqing	Environment protection bureau of Yu county	✓ Is there any issue in the monitoring plan? Or any concern regarding the capability of the PP to apply it?
	Li Liangde	Science & Technology bureau of Yu county	✓ Which is the most common stove?
	Pei cunjin	Agriculture bureau of Yu county	✓ How have relevant stakeholders been identified?
	Han wenping	Shanxi Jinqilin Energy Technology Company Ltd.	✓ Have all stakeholders, such as local residents and local GS NGO Supporters required by GS been invited?
	Chen Xiaofu	CAREI	✓ Were any video taken?
			✓ Regarding the survey

During the on-site assessment, DNV has applied standard auditing techniques to assess the quality of information provided. The following aspects of the Gold Standard project activity have been confirmed:

- The implementation and operation of the project activity;
- The information flow for generating, aggregating and reporting of the monitoring parameters; and
- The operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD.

Further, the following activities were performed:

- A cross-check between information provided in the monitoring report and data from other sources such as sales database, kitchen survey and kitchen tests;
- A review of calculations and assumptions made in determining the GHG data and emission reductions; and



- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

### 2.3 Reporting of findings

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable GS requirements have been met. The list of CLs and CARs has been described in detail in Appendix A.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period. No forward action requests (FAR) have been raised as part of the verification for the retroactive crediting period. The FARs that was raised as part of the validation is applicable to all future verifications.

## 3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Clean and Efficient Cooking and Heating Project, China” for the period 1 March 2009 to 30 September 2010.

### 3.1 Remaining issues, CARs, FARs from previous validation / verification

This is the first verification for the “Clean and Efficient Cooking and Heating Project, China” conducted in parallel with the validation.

The follow up action requests raised at the validation phase are as listed below:

Sl. No	Description	Comment from DOE
<b>FAR 1</b>	Please make sure SD indicators will be reported in each monitoring report even though SD monitoring might be less frequent than issuance request.	The SD indicators have been reported in the monitoring report /1/
<b>FAR 2</b>	At each time of verification the verification DOE shall validate and confirm that eligibility of the project activity is not undermined by the post-registration changes.	The validation and verification for this project activity was conducted in parallel. The verification is for the retroactive period and is not affected by the post registration changes.
<b>FAR 3</b>	As the footnote no.1 and the paper ‘Bottom-up estimate of biomass burning in Mainland China’ indicate, the crop residue used as fuel	The emission reduction for the monitoring period 1 March 2009 to 30 September 2010 consists of



	accounts for 25% of the total biomass, a fraction much higher than the baseline level of 2% HHs use biomass. GS requires that during future requests for issuances it should be discussed in the monitoring report and verified by DOE whether new households added to the cluster(s) defined in registered PDD meet the specifications of the cluster(s) particularly 'coal as predominant fuel for cooking'. If kitchen surveys show different fuel mix where large amount of biomass is consumed as cooking fuel then a new cluster shall be formed and new baseline shall be established and validated.	households only in the region of Shanxi and is the retroactive phase of the project.
<b>FAR 4</b>	<p>Post-registration Changes requiring the creation of new clusters that were not described in the original PDD must attain formal authorization following the Requirements of the Gold Standard Procedures For Approval of Design Changes 28/12/2010. Specific authorization is provided to include:</p> <ul style="list-style-type: none"> <li>• Household biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Institutional biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Other improved cooking and heating technologies that displace baseline coal consumption</li> </ul>	The emission reduction for the monitoring period 1 March 2009 to 30 September 2010 consists of households only in the region of Shanxi, cook stoves manufactured by Jinqilin is applicable to the retroactive phase of the project.
<b>FAR 5</b>	The project developer will have to identify whether the project will use a fixed or evolving baseline for new clusters	The project developer use a fixed baseline for the cook stoves disseminated in the region of Shanxi.

**The above listed FARs will have to be assessed in all future verifications.**

### 3.2 Project implementation

DNV was able to confirm that the project implementation is in accordance with the project description contained in registered PDD of 1 April 2011. The project started in 1 March 2009 and has disseminated 7101 Jinqilin cook stoves in 2009 and 6302 in 2010 in Shanxi province. The models that were distributed were model CKQ 80 and CKQ 80 I, manufactured by Shanxi Jinqilin Energy Technology Company Ltd. The thermal efficiency of Jinqilin



gasifier's in laboratory testing averaged 41.4% for CKQ 80 and 40.6% for CKQ 80I using biomass residues. The project replaces traditional coal cook stoves for cooking with the Jinqilin cook stoves that are fuelled with biomass.

DNV verified that in this monitoring period the project is fully implemented according to the description in the registered PDD of 1 April 2011. The verification team confirmed, through visual inspection that all physical features of the proposed project activity including data collection systems and storage have been implemented in accordance with the PDD. DNV confirmed during the on-site visit that in this monitoring period the project is completely operational. Neither a notification nor approval of change has been requested to Gold Standard Foundation.

### 3.3 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the registered PDD of 1 April 2011 is in accordance with the approved methodology applied by the project activity, i.e. GS approved monitoring methodology "Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes" (version 0.02).

### 3.4 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD of 1 April 2011. DNV confirms that the monitoring plan and the applied methodology have been properly implemented and followed by the project participant. All parameters stated in the monitoring plan, the cook stove methodology, version 0.02 and relevant Gold Standard requirements have been sufficiently monitored and updated as applicable, including:

Data / Parameter: (as in monitoring plan of PDD):	Method of estimation	Monitoring Frequency	Value/Assessment
$N_{y,i,c}$ - Number of stoves sold in year y of technology i in cluster c	Sales Record	Continuous	7 101 – year 2009 6 302 – year 2010
$U_{y,i,c}$ - Cumulative annual usage rate for stove age y of stove technology i in cluster c	Usage Survey	Biennial	Usage survey for year 0 – 1 age (100%)/ and 1 – 2 year (89%)/5/.
$AF_{py,Dcoal,y,i,c}$ - Net quantity of coal consumed per day in the project activity by traditional coal stoves in project households with improved stove technology i that is of age y years in cluster c.	Kitchen Performance Test	Biennial	0.90 tons/year /6/
$AF_{py,Apellet,y,i,c}$ - Net quantity of biomass pellets produced per year for use in the project activity in	Pellets not produced during this	Quarterly	NA



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year y by pellet production technology i for cluster c.	period		
$EF_{\text{Pellet Machine},i,c}$ - Emission factor (MWh/kg) for electricity consumption in year y for use by biomass pellet production technology i in cluster c	Same as above	Biennial	NA
$EF_{\text{EL},y,i,c}$ - Emission factor for electricity generation in year y for use by biomass pellet technology i in cluster c	Same as above	Biennial	NA
Quantity (MWh) of electricity consumed for pellet production ( $EC_{p,j,y,i,c}$ )	Same as above	Quarterly	NA
$TDL_{y,i,c}$ - Average technical transmission and distribution losses in year y for providing electricity to biomass pellet technology i in cluster c	Same as above	Biennial	NA

Parameter	Value/Comments
Measuring frequency:	Bi-annual
Reporting frequency:	Bi-annual
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Monitoring is conducted through surveys and kitchen performance tests.
Company performing the calibration:	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is(are) calibration(s) valid for the whole reporting period?	NA
How were the values in the monitoring report verified?	Review of kitchen survey, kitchen performance test, cross verification with regional data.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	DNV reviewed the sales record, kitchen performance test, usage survey and calculation worksheet to ensure correct transfer of the data and reporting. The project has spot checks conducted by Impact Carbon and audits conducted by the government that ensure correct data transfer and reporting.



### 3.5 Assessment of data and calculation of emission reductions

Impact Carbon submitted all the necessary data and parameters required to be monitored to DNV along with the monitoring report. All the parameters required to be monitored as per the registered PDD have been monitored and reported in the monitoring report. DNV reviewed the calculation worksheet for the emission reduction calculation for the monitoring period March 01, 2009 to September 30, 2010. DNV confirms that the formulas, conversions, aggregations and factors are consistent with the monitoring plan in the PDD. The reported data was cross-checked as follows:

- All the necessary data and all the parameters foreseen to be monitored in the registered PDD
- A Project Sales Database kept electronically by Impact Carbon /10/ was reviewed to determine the logging of how many stoves were sold during the monitoring period.
- Jinqilin had a record of sale card for each of the stoves sold and was able to cross verify the same with the sales database. Additionally, the usage surveys were reviewed and values cross verified with the values used in the calculation worksheet.

#### Emission Reduction

Emission Reduction were estimated in accordance to the prescriptions given in section 4.2 of the methodology.

$$ER_y = (AF_{bl,i,coal,y} - AF_{pj,i,coal,y}) \cdot NCV_{coal} \cdot EF_{combined} \cdot N_{1,Jinqilin\ CKQ,Shanxi} \cdot Usage_{Age}(\%)$$

Where,

$BE_y$  = baseline emissions in year y (in tonnes CO<sub>2e</sub> per year) specific to cluster and unit chosen

$AF_{bl,i,coal,y}$  = the mass of fossil fuel (bituminous coal) consumed during cooking in the baseline in year y by technology i (tons/ HH-year).

$AF_{pj,i,coal,y}$  = the mass of coal (bituminous coal) consumed during cooking in the project each year by technology i (tons/HH-year).

$NCV_{coal,i}$  = Net calorific value of fossil fuel coal in TJ/Gg

$N_{1,Jinqilin\ CKQ,Shanxi}$  = Number of Stoves sold

$EF_{coal,CO_2}$  = the CO<sub>2</sub> emission factor for use of coal in the baseline scenario in tons CO<sub>2</sub> per TJ fuel

$EF_{coal,N_2O}$  = the N<sub>2</sub>O emission factor for use of coal in the baseline scenario in tons N<sub>2</sub>O per TJ fuel

$EF_{coal,CH_4}$  = the CH<sub>4</sub> emission factor for use of coal in the baseline scenario in tons CH<sub>4</sub> per TJ fuel



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$EF_{\text{combined}} = \text{tCO}_2\text{e/TJ}$  including  $\text{CO}_2$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$

The below Table provides the emission factors that have been used for determination of baseline emissions from combustion of coal in traditional cook stoves. The baseline emissions are based on only the coal combusted in the traditional coal stove.

Description	Parameter	Value	Source
$\text{CO}_2$ emission factor for coal (tonnes/TJ)	$EF_{\text{bl,coal,co2,net}}$	94.6	IPCC default, 2006 Guidelines, Vol. 2, Ch. 2, Table 2.5/18/
$\text{CH}_4$ emission factor for coal (tonnes/TJ)	$EF_{\text{bl,coal,ch4,net}}$	0.3	IPCC default, 2006 Guidelines, Vol. 2, Ch. 2, Table 2.5/18/
$\text{N}_2\text{O}$ emission factor for coal (t/TJ)	$EF_{\text{bl,coal,n2o,net}}$	0.0015	IPCC default, 2006 Guidelines, Vol. 2, Ch. 2, Table 2.5/18/
Net Calorific Value for fossil fuel (coal)	$NCV_{\text{coal}}$	25.8	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Col 2, Ch 1.
GWP $\text{CH}_4$		21	
GWP $\text{N}_2\text{O}$		310	
$AF_{\text{bl,coal,Jinqilin CKQ,Shanxi}}$ - Net quantity of coal consumed per year in baseline by traditional coal stoves during the non-heating season in cluster Shanxi	kg/HH- year	2.83	Baseline fuel use study – Kitchen Survey /6/
$AF_{\text{pr,coal,Jinqilin CKQ,Shanxi}}$ - Net quantity of coal consumed per year in project by traditional coal stoves during the non-heating season in cluster Shanxi	kg/HH- year	1.04	Baseline fuel use study – Kitchen Survey /6/

**Leakage:**

The emissions caused due to transportation of cook stoves have been considered minor and hence negligible.

DNV is able to confirm that the calculation for the baseline and project emissions have been conducted correctly. The emission reductions from the project “Clean and Efficient Cooking and Heating Project, China” during the period 1 March 2009 to 30 September 2010 amount to 50 390 tonnes of  $\text{CO}_2$  equivalent.



### 3.6 Monitoring of Gold Standard Sustainable Indicators

Additional parameters monitored are in accordance with the monitoring plan for sustainability indicators as per requirements referred in Gold Standard Passport, version 7, 1 April 2011 **Error! Reference source not found.** and GS Monitoring Report - Version 4 Dated: 24 April 2011.

Sustainable Development Indicator	Monitoring source	Comments
Air Quality	Fuel Use Monitoring Report	The health impacts from the use of traditional coal stoves have been documented in the PDD./12//13//14/. The Jinqilin stove replaces the traditional coal stoves with improved biomass stoves. The fuel switch from coal to biomass in addition to the controlled combustion provided by the improved cook stove results in improved air quality.
Livelihood of the poor	Kitchen Test and Survey, Fuel Use Monitoring Report /6/	The kitchen test and kitchen surveys reflect the price of coal and the amount of coal used by households using traditional cook stoves. Biomass is available free of cost and the amount saved could be used elsewhere to improve household well-being.  DNV was able to confirm during the site visit through interviews with locals that the amount of money saved by switching to biomass from coal is significant and has a positive impact in their livelihood.
Access to affordable and clean energy services	Electronic Sales Records /10/	The project aims to reduce coal consumption and use of cheaper agricultural biomass residue that is a cleaner alternative to coal. DNV was also able to confirm during the site visit that coal uses up a significant portion of a family's income and the switch to biomass saves them money.

### 3.7 Management system and quality assurance

The Management System for the Project including the organization structure with the responsibilities was reviewed to determine effectiveness of the monitoring process being implemented for the project. As per the registered GS-VER-PDD, the Monitoring plan has clearly prescribed the management and operational procedures for the various steps including



the monitoring, recording, data management including backup, audit and training for relevant personnel involved in the Project. China Association for Rural Energy Industries (CAREI) has partnered with the project developer to conduct internal audits/spot checks to ensure the validity of information gathered. DNV has verified the Management and Quality Assurance procedures and found the management and operational system appropriate and effective.



#### 4 CERTIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the “Clean and Efficient Cooking and Heating Project, China” (Gold Standard Registration Reference No. GS949) for the period 1 March 2009 to 30 September 2010.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD.

DNV conducted the verification on the basis of the monitoring methodology GS approved monitoring methodology “Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes” (version 0.02), the monitoring plan contained in the registered Project Design Document of 1 April 2011 and the monitoring report (Version 04) of 24 April 2011. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV’s verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions of the “Clean and Efficient Cooking and Heating Project, China” (Gold Standard Registration No. GS949) for the period 1 March 2009 to 30 September 2010 are fairly stated in the monitoring report (Version 04) of 24 April 2011).

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology GS approved monitoring methodology “Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes” (version 0.02) and the monitoring plan contained in the registered PDD of 1 April 2011.

DNV Climate Change Services AS is able to certify that the emission reductions from the “Clean and Efficient Cooking and Heating Project, China” during the period 1 March 2009 to 30 September 2010 amount to 50 390 tonnes of CO<sub>2</sub> equivalent.

A handwritten signature in black ink, appearing to read 'Astakala Vidyacharan', with a horizontal line underneath.

Astakala Vidyacharan

A handwritten signature in black ink, appearing to read 'Miguel Rescalvo', with a horizontal line underneath.

Miguel Rescalvo



*CDM Verifier*  
DNV Hyderabad, India

*Regional Manager, America*  
Det Norske Veritas (U.S.A.), Inc.



## 5 REFERENCES

*Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the periodic verification conclusions, and are usually further checked through interviews with key personnel.*

- /1/ Impact Carbon and My Climate: Project Design Document – “Clean and Efficient Cooking and Heating Project”, version 04 of 1 April 2011.
- /2/ Impact Carbon and My Climate: Monitoring Report - – “Clean and Efficient Cooking and Heating Project”, 11 October 2010
- /3/ Impact Carbon and My Climate: Monitoring Report - – “Clean and Efficient Cooking and Heating Project”, version 4, 24 April 2011
- /4/ Beijing University of Chemical Technology and Impact Carbon: Usage Survey Report Jinqilin Stove Ages 0 – 1 Years, 24 April 2011
- /5/ Beijing University of Chemical Technology and Impact Carbon: Usage Survey Report Jinqilin Stove Ages 1 – 2 Years, October 2010
- /6/ Berkeley Air Monitoring Group: Impact of Jinqilin Improved Semi-Gasifier Stoves on Fuel Usage in Shanxi Province, China, October 2009
- /7/ Impact carbon: Spot Check for Jinqilin cook stove sales for 2009 – 2010, 11 October 2010
- /8/ Berkeley Air Monitoring Group: Impact of Jinqilin Improved Semi-Gasifier Stoves on Fuel Usage in Shanxi Province, China, October 2009
- /9/ Shanxi Jinqilin Energy Technology Co., Ltd: Records of trainings for customers by Jinqilin, March 2009 – August 2010
- /10/ Shanxi Jinqilin Energy Technology Co.: Sales Record and Customer Sampling Database, March 2009 – September 2010
- /11/ Gold Standard: Letter from Gold Standard on usage survey, 10 March 2011
- /12/ Aunan, K., Fang, J., Vennemo, H., Oye, K., Seip, H.M., 2004. Co-benefits of climate policy--lessons learned from a study in Shanxi, China. Energy Policy 32, 567-581.
- /13/ Desai, M., Mehta, S., Smith, K., 2004. Indoor smoke from solid fuels: Assessing the environmental burden of disease at national and local levels, WHO Environmental Burden of Disease Series, No.4. World Health Organization, Geneva.
- /14/ Smith, K., Mehta, S., Maeusezahl-Feuz, M. (Eds.), 2004. Ch.18 Indoor Air Pollution from Household use of Solid Fuels. World Health Organization, Geneva.

*Background documents related to the design and/or methodologies employed in the design or other reference documents.*

- /15/ Gold Standard Foundation: Gold Standard, version 2.1.
- /16/ Gold Standard Foundation: “Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes”, V.02., 2 August 2010
- /17/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 5.2 of 26 August 2008.
- /18/ IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories.



- /19/ Impact Carbon and My Climate: Gold Standard Passport – “Clean and Efficient Cooking and Heating Project”, version 04 of 1 April 2011.
- /20/ Impact Carbon and My Climate: Local Stakeholder Report – “Clean and Efficient Cooking and Heating Project”, version 04 of 1 April 2011.
- /21/ DNV, “Validation Report for Clean and Efficient Cooking and Heating Project”, version 3 dated 18 April 2011

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## **APPENDIX A**

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### **CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS**

**Corrective action requests**

<b>CAR ID</b>	<b>Corrective action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
<b>CAR 1</b>	<p>The monitoring period extends beyond the date of submission of the monitoring report to DNV for verification.</p> <p>The monitoring period can not extend beyond the date of submission of the monitoring report. The verification can only be conducted for a period where the monitoring has been completed.</p>	<p>The monitoring period has been updated to reflect sales 03/01/2009-09/30/2010.</p>	<p>The monitoring report has been revised to reflect the revised monitoring period 03/01/2009-09/30/2010. The revised emission reduction calculation, the supporting documents etc have been submitted to DNV.</p> <p><b>CAR 1 is closed.</b></p>
<b>CAR 2</b>	<p>The ex-post calculation worksheet does not reflect the number of cook stoves sold in the Monitoring period.</p>	<p>The ex-post calculation worksheet has been updated to reflect the monitoring period (CAR1).</p>	<p>The ex-post calculation worksheet has been updated to reflect the monitoring period 03/01/2009-09/30/2010.</p> <p><b>CAR 2 is closed.</b></p>
<b>CAR 3</b>	<p>The sales record reflects the total number of stoves that have been sold until September 2010. However, the emission reduction calculation worksheet takes the emission reduction from the fourth quarter of 2010 into account for total emission reductions.</p> <p>The emission reductions can be reported only for the cook stoves that have been sold in the market prior to start of verification.</p>	<p>PP has updated emission reductions to reflect sales during the monitoring period, and no longer includes Q4.</p>	<p>The calculation worksheet and the monitoring report have been revised to exclude the sales from the fourth quarter.</p> <p><b>CAR 3 is closed.</b></p>

<b>CAR ID</b>	<b>Corrective action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
<b>CAR 4</b>	<p>The electronic sales database does not have telephone number or complete address of the person buying the stove.</p> <p>The PDD states that this information will be transferred from sales card to the electronic</p>	<p>Contact information is provided for each purchaser to the greatest extent possible. In accordance with the PDD monitoring plan and GS Methodology, PP provides complete contact information for "as many as possible," given that many rural users do not have complete contact information such as home phones, or because the stove was bulk purchased through the village leader.</p>	<p>The Gold Standard Methodology "Indicative Programme, Baseline, and Methodology for Improved Cook-Stoves and Kitchen Regimes", V.02., 2 August 2010 requires project developers to provide contact information to the greatest extent possible. The project developers have provided contact information for the end customers to the greatest extent possible. <b>CAR 4 is closed</b></p>
<b>CAR 5</b>	<p>The usage survey for 0-1 year (usage year) was conducted in 2008 prior to the start of the project activity. The usage survey sample should be randomly from users having made their purchase in the first year of the project.</p>	<p>Response from GS submitted to DNV</p>	<p>The usage survey for 0-1 year (usage year) was conducted in 2008 prior to the start of the project activity. GS has accepted this since the survey was conducted for stoves 0-1 year and these stoves were not included as part of the emission reduction./11/ <b>CAR 5 is closed</b></p>
<b>CAR 6</b>	<p>Reference to water treatment technologies has to be removed from the monitoring report.</p>	<p>All references to water treatment have been removed.</p>	<p>The monitoring report has been revised to remove all references to water treatment technologies. <b>CAR 6 is closed</b></p>

**Clarification requests**

<b>CAR ID</b>	<b>Corrective action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>

**Forward action requests from validation**

<b>FAR ID</b>	<b>Forward action request</b>	<b>Assessment of how FAR has been addressed</b>
<b>FAR 1</b>	Please make sure SD indicators will be reported in each monitoring report even though SD monitoring might be less frequent than issuance request.	The SD indicators have been reported in the monitoring report /1/
<b>FAR 2</b>	At each time of verification the verification DOE shall validate and confirm that eligibility of the project activity is not undermined by the post-registration changes.	The validation and verification for this project activity was conducted in parallel. The verification is for the retroactive period and is not affected by the post registration changes.
<b>FAR 3</b>	As the footnote no.1 and the paper 'Bottom-up estimate of biomass burning in Mainland China' indicate, the crop residue used as fuel accounts for 25% of the total biomass, a fraction much higher than the baseline level of 2% HHs use biomass. GS requires that during future requests for issuances it should be discussed in the monitoring report and verified by DOE whether new households added to the cluster(s) defined in registered PDD meet the specifications of the cluster(s) particularly 'coal as predominant fuel for cooking'. If kitchen surveys show different fuel mix where large amount of biomass is consumed as cooking fuel then a new cluster shall be formed and new baseline shall be established and validated.	The emission reduction for the monitoring period 1 March 2009 to 30 September 2010 consists of households only in the region of Shanxi and is the retroactive phase of the project.

<b>FAR ID</b>	<b>Forward action request</b>	<b>Assessment of how FAR has been addressed</b>
<b>FAR 4</b>	<p>Post-registration Changes requiring the creation of new clusters that were not described in the original PDD must attain formal authorization following the Requirements of the Gold Standard Procedures For Approval of Design Changes 28/12/2010. Specific authorization is provided to include:</p> <ul style="list-style-type: none"> <li>• Household biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Institutional biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Other improved cooking and heating technologies that displace baseline coal consumption</li> </ul>	<p>The emission reduction for the monitoring period 1 March 2009 to 30 September 2010 consists of households only in the region of Shanxi, cook stoves manufactured by Jinqilin and imprand is the retroactive phase of the project.</p>
<b>FAR 5</b>	<p>The project developer will have to identify whether the project will use a fixed or evolving baseline for new clusters</p>	<p>The project developer use a fixed baseline for the cook stoves disseminated in the region of Shanxi.</p>

**Forward action requests from this verification**

<b>FAR ID</b>	<b>Forward action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
<b>FAR 1</b>	<p>Please make sure SD indicators will be reported in each monitoring report even though SD monitoring might be less frequent than issuance request.</p>		

<b>FAR ID</b>	<b>Forward action request</b>	<b>Response by Project Participants</b>	<b>DNV's assessment of response by Project Participants</b>
<b>FAR 2</b>	At each time of verification the verification DOE shall validate and confirm that eligibility of the project activity is not undermined by the post-registration changes.		
<b>FAR 3</b>	As the footnote no.1 and the paper 'Bottom-up estimate of biomass burning in Mainland China' indicate, the crop residue used as fuel accounts for 25% of the total biomass, a fraction much higher than the baseline level of 2% HHs use biomass. GS requires that during future requests for issuances it should be discussed in the monitoring report and verified by DOE whether new households added to the cluster(s) defined in registered PDD meet the specifications of the cluster(s) particularly 'coal as predominant fuel for cooking'. If kitchen surveys show different fuel mix where large amount of biomass is consumed as cooking fuel then a new cluster shall be formed and new baseline shall be established and validated.		

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
<b>FAR 4</b>	<p>Post-registration Changes requiring the creation of new clusters that were not described in the original PDD must attain formal authorization following the Requirements of the Gold Standard Procedures For Approval of Design Changes 28/12/2010. Specific authorization is provided to include:</p> <ul style="list-style-type: none"> <li>• Household biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Institutional biomass cooking and heating stoves manufactured by companies other than Jinqilin</li> <li>• Other improved cooking and heating technologies that displace baseline coal consumption</li> </ul>		
<b>FAR 5</b>	<p>The project developer will have to identify whether the project will use a fixed or evolving baseline for new clusters</p>		