

Monitoring Report: Project Start – 2009-03-01

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Project Database period (stove sales eligible for crediting): 1 March 2009 to 30 September 2010

Emissions Reduction crediting period: 1 March 2009 to 30 September 2010

Submission by Impact Carbon on behalf of Jinqilin stove manufacturer with assistance from The Climate Protection Partnership (myclimate) and local partner China Association for Rural Energy Industries (CAREI).



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1. Introduction

With respect to the Voluntary Gold Standard PDD titled:

Clean and Efficient Cooking and Heating Project, China

This report documents the installation of improved agricultural residue semi-gasifier cooking stoves in Shanxi Province, China as sold by Jinqilin Stove Manufacturers Ltd. (Model CKQ) from March 1, 2009 to September 30, 2010.

This report also documents the emissions reductions generated by these stoves between March 1, 2009 to September 30, 2010. The retroactive crediting window accepted by the Gold Standard is two years from the date of project registration, and thus begins March 1, 2009.

2. Project Description and Summary

During the period from March 2009 through today, this project has achieved significant results in three areas: business development of Jinqilin; social, economic and environmental co-benefits to local communities; and greenhouse gas emissions reductions.

The primary implementing partner and stove manufacturer, Jinqilin, is transitioning from a make-shift village level business into an efficient and well structured company exhibiting sustainable growth and improved practices. With assistance from project partners, Jinqilin has established sound business operating practices, including tracking of procurement and distribution supply chains, and expanded training and maintenance operations.

Jinqilin has developed a quality control system for the stove production process, in order to increase the average lifetime of stoves sold, and ensure efficient combustion and greenhouse gas reductions. To this end, Jinqilin is also establishing a customer service system which will assist with end-user technical support.

Since project inception Jinqilin's reporting and record keeping has become progressively more clear, rigorous, and comprehensive. For carbon credit generation, the system was set up to provide a conservative catalogue of stoves distributed. We are now preparing to implement an improved electronic accounting system, which will allow better record keeping of inventory and sales records.



Figure 1. Village level stove usage training ensures proper use, combined with overall improved customer service, increases the trust and reputation of the Jinqilin Company.



Figure 2. Workers are assured a steady workflow, and a steady income, as a result of the business development introduced by the project proponents. Pictured here is newly implemented production quality control that examines combustion body linings to ensure no cracks exist in the clay combustion chambers, which could lead to poor stove performance.

In addition to business development, this project has provided many ancillary benefits in Shanxi province. Locally, the project has provided employment for significant numbers of workers, office staff and field technicians. The

program aims to reach underprivileged families, which normally cannot afford improved stoves, by subsidizing the manufacture and sale of high quality, long lasting stoves with financial subsidies. This is an opportunity that was not previously viable without carbon finance to help cover project implementation expenses during the credit period.

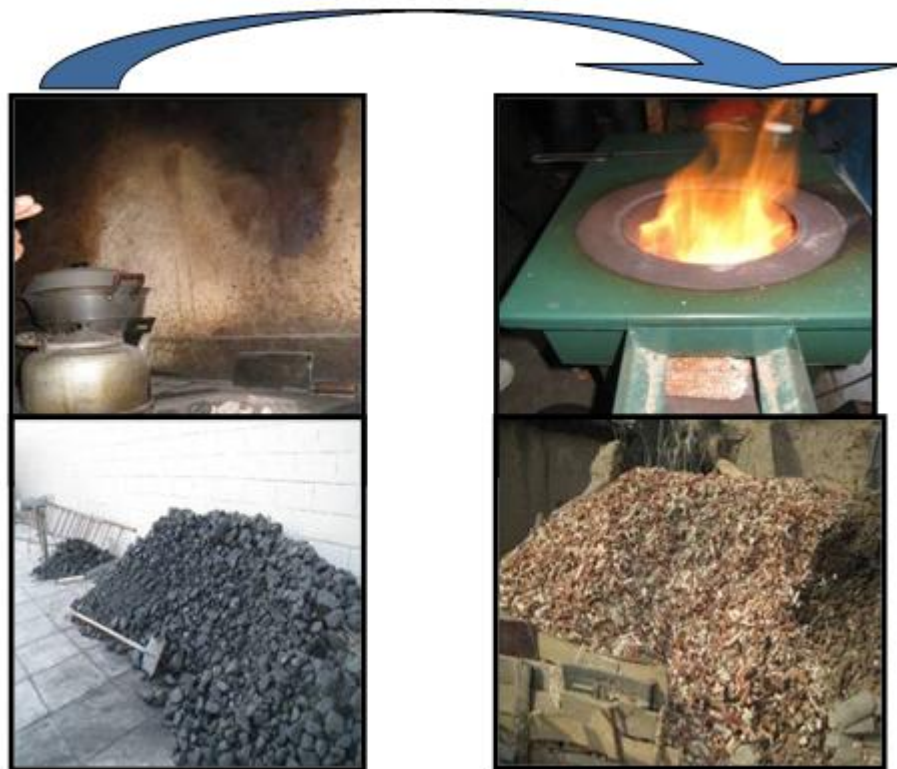


Figure 3. Upper Left: Traditional coal stove with black stained kitchen walls from cooking indoors with coal fuels. **Lower Left:** Raw coal fuel for household cooking and heating. The coal shown here is for sale and would be sufficient for several households during a year. **Upper Right:** Jinqilin biomass semi-gasifier stove with corn cob fuels burning. **Lower Right:** Surplus dried corn cobs used as cooking fuel for the Jinqilin stove.

Reduced coal consumption, and subsequent cost savings for regular families using Jinqilin, is perhaps the most pronounced social benefit of this project. Families spend between 10% and 15% of annual income on cooking fuels in rural settings such as Yu County.



Figure 4. **Left:** Raw coal being delivered and sold for cooking and heating in rural Shanxi. **Right:** Household corn yield being dried before the kernels are removed for sale. The remaining corn cobs will be saved for use with the Jinqilin stove.

The project introduces environmental benefits through reduced fossil fuel coal use. The dissemination of high-efficiency cooking stoves, in a province in which over 80% of the population cooks with traditional stoves and coal fuels, is an example of the kind of solution that is needed to address increasing trends of fossil fuel usage.

In developing the carbon asset, the project proponents have taken several steps to prepare Jinqilin for sustainable growth that could meet the future projected demand for stoves. First, the project proponents assisted with developing a monitoring and tracking system for stove sales. This has allowed Jinqilin to better prepare for potential future cost barriers, as well as more accurately track customer locations and needs. With respect to the latter, the project proponents are assisting with the development of a customer service and technical maintenance division at Jinqilin. This new division will help to ensure quality follow-up is available for both village level customer training as well as technical training related to maintenance issues. This new division addresses an important barrier to systemically changing fuel use in coal-rich Shanxi, which is the lack of a concerted and sophisticated customer service operation to create market trust and technological reliability.

Several new initiatives are planned to improve the customer service division:

- Expanded up-front customer training on stove usage
- Educational programs for villages on the health benefits from using improved stoves
- Manufacturing quality control systems to ensure long-term reliability of stoves

Site visits during 2010 by Impact Carbon and CAREI revealed that the project continues to achieve the social, economic, and environmental impacts that it is intended to achieve. Environmentally, all impacts outlined in the PDD are being achieved, as stove sales continue to reduce pressure on inefficient use and burning of fossil fuel coal. Economically, Jinqilin continues to improve the limited incomes of impoverished rural Shanxi families, and to improve their health.

Impact Carbon is focused on changing the household energy paradigm in Shanxi from inefficient and unhealthy cookstoves to efficient, improved stoves. Achieving this shift on a national scale requires sustained business development assistance and stove subsidies financed by expected carbon payments.

In 2010, with expectation of future emissions reductions from retroactive carbon credits, the company is planning to build larger manufacturing facilities to handle expanded production and storage. This facility will also help to ensure steady work for employees by allowing excess stoves to be stored in the storage facility prior to actual sales.

The project proponents have also worked with Jinqilin to improve the quality and durability of the Jinqilin stove. During the project period, Jinqilin began exploring new dials that would more easily adjust flame power. They are currently product testing a stove that uses a single dial (as opposed to 2 dials on the current stove model) to moderate fan air and subsequently flame power.

The project proponents have also provided strategic vision for growth. Jinqilin hopes to eventually reach poor rural households outside of Yangquan City. Thus Jinqilin has also begun to explore possible biomass pellet technologies that could be cost-competitive with coal fuels for communities with less biomass supplies. With carbon revenues, Jinqilin will have the resources to product test pellet technologies and new distribution networks in other regions of Shanxi.

Costs related to stove production are increasing steadily as the price of raw materials rises. In January 2008, the Jinqilin production manager estimated that the raw material and labor cost of each Jinqilin stove was 600RMB. By January 2009 this cost had risen to 700RMB. This indicates an increase of 16%, with labor costs and steel prices expected to rise even more sharply in the coming years.

3. Emission Reductions Calculations

The table shows the CO₂e emissions reductions achieved during the project period reported by the GS VER project *Clean and Efficient Cooking and Heating Project, China*. The sales and installations of these stoves took place during the period 1 March 2009 through 30 September 2010.

Figure 5. Summary of emission reductions during crediting period 1 March 2009 through 30 September 2010

<i>Emission Reductions (tCO₂e)</i>		<i>March 1, 2009: Retroactive Project Database start date</i>						
		<i>2009</i>				<i>2010</i>		
<i>Project Year</i>	<i>Stove Usage Period:</i>	<i>q1</i>	<i>q2</i>	<i>q3</i>	<i>q4</i>	<i>q1</i>	<i>q2</i>	<i>q3</i>
<i>Stove Age</i>								
<i>Age 0-1</i>		99	2,692	5,817	7,824	8,713	8,270	8,840
<i>Age 1-2</i>		-	-	-	-	93	2,544	5,497
	<i>Total Annual Carbon Volumes (tCO₂e)</i>	99	2,692	5,817	7,824	8,806	10,814	14,338
<i>Total</i>	50,390							

Explanation of Emission Reduction Calculations

The Emissions Reduction (ER) Calculator calculates total emissions reductions on a quarterly basis for each stove in the Project Database. The ER Calculator is run separately for each cluster of stoves defined for the project. During the current reporting period the project defines a single cluster consisting of coal stove users.

The calculator accounts for the day that each stove begins use and calculates the usage of each stove in each quarter. It factors in the monitored annual drop-off in usage as stoves age, and other monitored parameters¹. Stove usage is calculated in stove-years, the number of stove days the stove was used divided by 365 (days). Quarterly usage² (stove-years) for the cluster is multiplied by the emissions reduction per stove-year (tCO₂e/stove-year) calculated in the PDD to quantify total ERs per project quarter.

The 'Parameters' worksheet of each ER Calculation workbook states the 'Stove Days in Inventory', 'Usage Rates', and 'Emission Reductions' (tCO₂e/stove-year). Jinqilin sales are listed in the 'Project Database' worksheet.

Stove quantities and 'Usage Start-Dates' are linked from the 'Usage Record' worksheet to the 'Age 0-1', 'Age 1-2', worksheets. These two 'Use' worksheets calculate usage on a daily basis for each day of the project period (x-axis) for each 'Usage Start-Date' and the corresponding stove quantity (y-axis). The two 'Use' worksheets are separate to account for stove usage at different ages. Usage for all stoves aged 0 - 1 year, which are in their 1st year of use, is accounted in the 'Age 0-1' worksheet, usage for all stoves aged 1 – 2 years, which are in their 2nd year of use, is accounted in the 'Age1-2' worksheet.

Daily stove use (stove-days) is calculated using Annual Usage Rates for stoves of different ages (age_{i_j}). The Annual Usage Rates are calculated to reflect annual usage drop-off from the Cumulative Usage Rates (CumUi) determined in the monitoring studies below. The Annual Usage Rate (age_{i_j}) is the average annual drop-off in usage. That rate is applied to all stoves equally over the full year they are of a given age (Age 0-1, Age 1-2, etc.).

Calculating Annual Usage Rates (age_{i_j}) from Cumulative Usage Rates (CumUi) is straightforward: If 100 of 100 monitored stoves are still in use after one year, the Cumulative Usage Rate (CumU1) after one year is 100%. If 50 of the original 100 stoves are still in use after two years, the Cumulative Usage Rate (CumU2) after two years is 50%. The Annual Usage Rate (age_{0_1}) in year 1 is 100%. The Annual Usage Rate (age_{1_2}) in year 2 is 75% ((100%+50%)/2).

Once daily stove usage (stove-days) is accounted in the 'Use' worksheets for stoves from each 'Usage Start-Date', it is converted to stove-years by dividing stove-days by 365. Stove-years of usage are aggregated on a quarterly basis in the 'ER Calculations' worksheet.

Finally, on the 'ER Calculations' worksheet, aggregate quarterly stove use (stove-years) is multiplied by ERs per stove-year (tCO₂e/stove-year) to calculate total ERs on a quarterly basis. The values from the 'ER Calculations' worksheet provides a summary of ERs for the current verification crediting period.

4. Monitoring of parameter values

The tables below summarize the updated values of all the monitored parameters as defined in the PDD monitoring plan. The source of each value is given in the table, and the relevant reports are separate files sent with this document. The values applied were assessed in the Baseline Study and KPT Monitoring Report which was performed beginning in October 2008.

The following tables reproduce the parameters listed in the PDD Section B.7.1. Data and parameters monitored:

Figure 6 - Monitored parameters/variables

¹ The full set of parameters is given in the monitoring tables below.

² Excel Worksheet: ER Calculations

ID #	Data variable	Source of data, units	Recording frequency	Comment	Values For ER Calculator
1	Number of stoves sold ($N_{y,i,c}$)	Sales Records	Continuous	The Jinqilin Sales Record provides a conservative record of Jinqilin sales. These records are kept in Microsoft Excel. More information on sales records is provided in Section 6: Project Database. The sales record is used to create the Project Database, which re-organizes sales data and tracks the quantity of stoves sold each day, by cluster.	See Figure 9
2	Net quantity of coal consumed per day in project year y ($AF_{py,Dcoal,y,i,c}$)	Kitchen Performance Test	Biennial	The findings of the monitoring KPTs as reported in 05 Fuel Use Monitoring Report. The reported Baseline and Project Fuel consumption values remain the same for the full set of current stove vintages, as project inception began less than 2 years ago (thus only 1 bi-annual KT has been conducted). The next bi-annual Kitchen Test will be conducted in 2011.	See Figure 7
3	Clustering definitions	Kitchen Surveys	Biennial	The monitoring activities reported here found no reason to change PDD defined clusters.	05 Fuel Use Monitoring Report
4	Usage rate of improved stoves ($U_{y,i,c}$)	Usage Surveys	Biennial	These numbers are applied to stoves aged 1-2 years. See 05 Fuel Use Monitoring Report, and 03a-Usage Survey Report Jinqilin Stove Ages 1-2 Years.doc	See Figure 8
5	New Stove performance	Additional Kitchen Performance Tests and Kitchen Surveys for additional stove clusters and stove technologies	When a new cluster or technology is added, or every two years	No new stove models	N/A

6	Net quantity of biomass pellets produced per year ($AF_{py,Apellet,y,i,c}$)	Monitoring Survey	Quarterly	No pellets were produced or used in the current verification period	N/A
7	Emission factor (MWh/kg) for electricity consumption for pellet production ($EF_{Pellet Machine,i,c}$)	Study	Biennial	No pellets were produced or used in the current verification period	N/A
8	Emission factor (tCO ₂ /MWh) for electricity generation for pellet production ($EF_{Pellet Machine,i,c}$)	Study	Biennial	No pellets were produced or used in the current verification period	N/A
9	Quantity (MWh) of electricity consumed for pellet production ($EC_{pj,y,i,c}$)	Monitoring Survey	Quarterly	No pellets were produced or used in the current verification period	N/A
10	Average technical transmission and distribution losses (TDL _{y,i,c})	Study	Biennial	No pellets were produced or used in the current verification period	N/A

Carbon Calculator Inputs:

Based on the fuel consumption tables below (Figure 7), the estimated emissions reduction per stove year is assessed to be 4.07 tons CO₂-equivalent per year (*Detailed calculation found in 01-Emissions Reduction Calculation.xlsx in excel tab Assumptions*). Annual emission reductions (ER) are based on the mean value (according to 90/15 rule) for daily baseline coal use, annual usage drop-off rates (Figure 8), and average self-reported heating months during which the Jinqilin stove is used (Figure 9).

The following values for CO2e savings per stove year are entered into the ER Calculator:

Figure 7. Annual coal consumption in baseline and project activity

FUEL USE PER HH		Baseline Coal Consumption				
Fuel Type	N	Daily Mean Coal Use (kg/day)	Lower 90% CI Adjustment Factor (kg/day)	Adjusted Daily Mean Coal Use - Lower 90% CI (kg/day)	Avg. Annual Coal Use (Months)	Annual Mean Coal Use (tons/yr)
Coal	38	7.74 (3.84)	87%	6.73	12	2.83
FUEL USE PER HH		Project Coal Consumption				
Fuel Type	N	Daily Mean Coal Use (kg/day)	Lower 90% CI Adjustment Factor (kg/day)	Adjusted Daily Mean Coal Use - Lower 90% CI (kg/day)	Avg. Annual Coal Use (Months)	Annual Mean Coal Use (tons/yr)
Coal	38	7.74 (3.84)	87%	6.73	4.4	1.04

A household survey of representative, randomly sampled, stove purchasers determine average drop-off in usage ($U_{y,i,c}$). To date, the initial kitchen survey reports 100% usage after year 1, and a September 2010 usage survey that reports 89% usage after year 2 (this is prior to the bi-annual survey, but was conducted for the purposes of initial DOE validation and verification). The following stove usage numbers are entered into the calculator:

Figure 8. Cumulative Usage Drop-Off of Jinqilin Stove Users

Parameter	Value	Units	Source
Usage, Age 0-1	1.00	fractional	03b-Usage Survey Report Jinqilin Stove Ages 0-1 Years
Usage, Age 1-2	0.89	fractional	03a-Usage Survey Report Jinqilin Stove Ages 1-2 Years

The total number of stoves sold between 1 March 2009 to 30 September 2010 was 13,403.

Figure 9. Cumulative stoves sold

Parameter	Value	Units	Source
$N_{1,Jinqilin\ CKQ,Shanxi}$	7,101	Stoves sold in 2009	01-Emissions Reduction Calculation.xlsx in excel tab Project Database
$N_{2,Jinqilin\ CKQ,Shanxi}$	6,302	Stoves sold in 2010	01-Emissions Reduction Calculation.xlsx in excel tab Project Database

5. Leakage Assessment

The PDD outlines the data and information that is to be collected in order to monitor leakage effects of the project activity. In accordance with Gold Standard VER methodology "Improved Cookstove Kitchen Regime-V.02," the project assessed each of the listed forms of leakage. The project finds leakage in section D "The project population compensates for loss of the space heating effect of inefficient cook-stoves by adopting some other form of heating

or by retaining some use of inefficient stoves,” thus emission reduction calculations apply the reported value in the PDD of 4.4 months of average self-reported months of heating. No leakage is found for fuel production in the project activity since pellets were not used. Leakage is, however, applied for stove transport in the project activity.

Figure 10. From PDD Section B.6.1 Sub-step 2.4, Figure B.5:

d) The project population compensates for loss of the space heating effect of inefficient cook-stoves by adopting some other form of heating or by retaining some use of inefficient stoves.

Justification (d): Leakage. The Project conservatively assumes that the improved stove is not used during heating months and credits only 7.6 “non-heating” months of displaced coal used for cooking. The duration of heating and non-heating months was determined from over 400 kitchen surveys. During months in which space-heating is required, it is assumed that local users revert to traditional stoves for both heating and cooking, and discontinue use of the improved stove. Although it is possible that some biomass stoves are used during the heating season, the project conservatively excludes coal replacement during heating months due to biomass stove use.

f) Significant emissions from transportation or construction involved in the project activity, including emissions associated with production/transport of the efficient stoves themselves, or production/transport of project fuels (for example briquette manufacture and supply may be energy-intensive).

Justification (f): Leakage. All biomass fuels are manually harvested and sourced locally. Project activities will result in a reduction in production and transport of raw coal, which is generally much more energy intensive than household biomass harvesting.

With regards to technology distribution, all stoves during the first verification period have been distributed locally within Yangquan city. During the period March 1, 2009 - September 30, 2010, Jinqilin stoves were trucked in bulk to villages 97 times.³ The furthest distance traveled was 67 kilometers.⁴ Each Jinqilin stove weighs 45kg. Applying a conservative estimate of 105 gCO₂/ton-km,⁵ total transport emission is 0.03 tCO₂ per stove, or 0.6% of total annual stove emissions. No leakage is applied as transport emissions are insignificant by virtue of constituting less than 1% of overall emissions.

Truck deliveries	97
Distance travelled per delivery (km)	67
Stove weight (g)	0.045
Stoves sold 01/01/2009-09/30/2010	13403
Emission factor truck (gCO ₂ /ton-km)	105
Total Transport Emissions (tCO ₂)	412
Transport Emissions Per Stove (tCO ₂)	0.03

2009 Transport Leakage = 7,101 Stoves * 0.03 tCO₂e = 213 tCO₂e

2010 Transport Leakage = 6,302 Stoves * 0.03 tCO₂e = 189 tCO₂e

³ Source: Project Database

⁴ Total area of Yanguan City is 4451 km². Truck deliveries travel a maximum distance of 67 kilometers (67km = sqrt(4451km²)).

⁵ Truck emissions range between 60-150gCO₂/ton-km, the midpoint is 105 gCO₂/ton-km.

<http://timeforchange.org/co2-emissions-shipping-goods>

Figure 11. From PDD Section B.7.1:

Data / Parameter:	T _{heating months,Shanxi}
Data unit:	Months
Description:	Average self-reported months of heating in cluster Shanxi
Source of data used:	Baseline Monitoring Report (Annex 3)
Value of data	4.4 months Value derived from ex-ante baseline survey results
Description of measurement methods and procedures to be applied:	Value used in fixed baseline. Baseline household surveys evaluated average self-reported months of heating in year y. Estimates for average annual non-heating months are derived from the results of the household survey.
QA/QC procedures to be applied:	Review by VER Director
Any comment:	All data collected as part of monitoring was archived electronically and will be kept at least for 2 years after the end of the last crediting period.

6. Project Database: Quality assurance

In accordance with the Project's PDD Section B.7.1. *Data and parameters monitored*, careful attention has been paid to the accuracy of the sales record. As explained in this section, the Project Database is a conservative record of all Jinqilin stoves that have entered use.

The project began in March 2009 selling and distributing stoves with the expectation of carbon finance to assist with carbon asset development costs and stove subsidies. In 2009, a system was set up to track stoves sold. The current system does not count stoves that go missing from the Jinqilin Factory to further ensure conservativeness.

Method of Collection:

A Project Database is kept electronically by Impact Carbon: this is *01-Emissions Reduction Calculation.xlsx* in excel tab *Project Database*. The database logs how many stoves entered use on each day. Impact Carbon maintains this file as a password protected excel document.

The Project Database is created from the Jinqilin Sales Record. The Jinqilin Sales Record logged sales and distribution information in an excel spreadsheet. Jinqilin saved paper sales receipts that allow cross checks of sales. The sales records were checked by the Beijing based Ministry of Agriculture NGO – China Association for Rural Energy Industries (CAREI). CAREI audited sales entries and contacted customers to confirm that sales records were accurate. Paper invoices and receipts are saved to provide an additional cross-check.

Project Database Electronic Record History:

Jinqilin is now supplementing their paper sales record with an electronic record stored in Microsoft Excel. The electronic file records the day of sale, county and village, and number of stoves sold.

7. The Detailed Customer Database

The Detailed Customer Database is maintained by Impact Carbon to capture records of Kitchen Survey interviews.

Project Database Information

Sales cards are collected for each stove at the point of sale. The card includes the user's name and contact information. End user information is inputted into an electronic sales database categorized by location and date. CAREI verifies the sales database against paper sales cards, follow-up phone calls and site visits.

8. Quality Assurance

Quality assurance measures have been implemented by the China Association for Rural Energy Industries (CAREI). CAREI is a Chinese non-profit staffed by rural energy experts based in Beijing, China. CAREI is housed under a branch of the China Ministry of Agriculture (MOA), and was founded by previous MOA minister Madam Deng Keyun. CAREI was instrumental in the 1980's and 1990's in organizing MOA's National Improved Stove Program (NISP) that disseminated over 180 million improved stoves throughout China. Although the NISP stoves are now considered inefficient and "traditional" by today's standards, CAREI continues monitoring and evaluation, and outreach efforts to sustain the rural energy infrastructure set up by the NISP. CAREI has extensive experience developing and employing household energy survey tools, and with assistance from Dr. Liu Guangqing, Professor of Environmental Engineering at the Beijing University of Chemical Technology, has extensive experience conducting trainings in customer and group assessment. To date, CAREI has conducted extensive surveys and site visits to verify the Jinqilin sales record. CAREI is also responsible for applying random spot checks by calling the phone numbers on sales cards to ensure the validity of information gathered. CAREI continues to work with Jinqilin to implement a system of precise and accurate production and inventory accounting.

9. Sustainable development indicators

The following table monitors the most sensitive sustainable development indicators:

Figure 13. Sustainable development indicators.

Sustainable Development Indicator	Monitoring source	Variables, Units and Frequency of Measurements	Monitored result
<i>Air quality</i>	Fuel Use Monitoring Report	<i>Air pollutants (CO, particulates)</i>	<p>As stated in the PDD Section A2, improved stoves generally reduce indoor air pollution and improve air quality.</p> <p>The Kitchen Survey Report reveals that most Jinqilin customers continue to cook inside their house. Jinqilin stoves are significantly contributing to an improvement in air quality inside these houses by reducing levels of indoor air pollution from inefficient coal stove smoke.</p> <p>Bi-annual Kitchen Performance Tests will further assess air quality impacts of the Jinqilin stove.</p>
<i>Lively-hood of the poor</i>	05 Fuel Use Monitoring Report	<i>Financial impact</i>	<p>The impact of the Jinqilin project on livelihood of the poor was monitored by the amount of money saved by Jinqilin users based on the price of coal and the amount of fuel savings recorded in the Kitchen Performance Test.</p> <p>Jinqilin continues to increase the spending power of lower income Shanxi residents by reducing the amount families must spend on coal.</p> <p>Take for example a typical family in rural Shanxi who bought an improved stove. Based on ex-ante surveys and monitoring, we estimate that a typical household requires an average 1.56 tons of raw coal for cooking during the non-heating season – this conservatively assumes that a household will use the stove for only two-thirds⁶ of the year. A household purchased coal in 2009 for cooking amounting to 936-1,716 RMB⁷ (\$140-\$256 USD), or roughly 10%-18% of a household's average annual income (assuming a dual income household: 2 persons x 4,698 RMB⁸ (\$691 USD) per capita annual income = 9,396 RMB (\$1,382 USD) per household).</p>

⁶ Two-thirds of the year is roughly equivalent to the number of non-heating months reported in the household kitchen surveys (7.6 months).

⁷ The price of coal has fluctuated in the past 10 years between 600-1100 RMB per ton of raw coal (Yu County Government Statistics, 2009).

⁸ China Statistical Yearbook, China National Bureau of Statistics, 2007

			<p>Considering a conservative lower bound cost for raw coal (600RMB/ton), a household saves 936RMB per year by displacing coal with biomass, which is substantially greater than the cost of purchasing a Jinqilin stove at 230RMB (33% household contribution to capital costs).</p> <p>Providing upfront financing in the form of partial subsidies not only assists in expanding the market for cleaner burning and more efficient stoves, but also helps to ameliorate the large economic burden resulting from a reliance on coal for year round cooking needs.</p>
<i>Employment</i>	Jinqilin Employment	<i>Numbers</i>	As Jinqilin grows, it will continue to hire and employ people in Yu County of Shanxi in administrative, sales, production and management positions. The growth of Jinqilin will provide steady and long-term employment for new skilled labor. Jinqilin currently employs 56 workers.
<i>Access to Energy Services</i>	02-Electronic Sales Records.xlsx	<i>Fuel cost, consumption, ease of collection</i>	Project proponents monitor the access Jinqilin provides for rural Shanxi households to efficient energy technologies through sales records. Between March 1, 2009 and September 30, 2010, Jinqilin provided Shanxi residents with an average of 609 efficient stoves per month. Monthly sales records are cross-checked with production records by CAREI and reported to Impact Carbon.
<i>Human and institutional capacity</i>	04-Jinqilin Customer Training Record.pdf	<i>Skill levels</i>	<p>Under the project, Jinqilin continues to invest in trainings that build human and institutional capacity, such as internal quality control systems, accounting systems, and improved manufacturing systems.</p> <p>Recordkeeping Training: CAREI prepared a written set of recordkeeping recommendations to Jinqilin and provided Jinqilin staff with on-the-job training. In addition, CAREI has provided Jinqilin with record keeping training on behalf of Impact Carbon. These trained recordkeeping techniques have since been adopted by Jinqilin.</p> <p>Technical Training: Jinqilin has been able to build capacity and provide training to labourers and customers.</p>
<i>Technological self-reliance</i>	05 Fuel Use Monitoring Report	<i>Achievement</i>	Jinqilin continues to innovate and improve stove technology in Shanxi through research and development operations. KPTs to document the fuel savings will be repeated bi-annually as stated in the PDD monitoring plan.

10. Appended files list

1. Emissions Reduction Calculations
2. Electronic Sales Record
- 3a. Usage Survey Report Jinqilin Stove Ages 1-2 Years
- 3b. Usage Survey Record Jinqilin Stove Ages 0-1 Years
- 3c. Usage Survey Record Jinqilin Stove Ages 0-1 and 1-2 Years
4. Jinqilin Training Record
5. Fuel Use Monitoring Report
6. Spot Check of Jinqilin Sales Records