



**PROGRAMME DESIGN DOCUMENT FORM FOR
SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES (F-CDM-SSC-PoA-DD)
Version 02.0**

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Micro Hydro Power Plant Promotion Programme in Regions on the Upper Reaches of the Yangtze River, China (Micro Hydro Power Plant Promotion Programme in Forest Regions of Liangshan Prefecture, Sichuan Province)

06/01/2014

Version: 6.0

A.2. Purpose and general description of the PoA

For protecting forest ecosystem in the upper reaches of the Yangtze river, WWF China Chengdu Programme Office (WWF) and PEAR Carbon offset Initiative, Ltd. (PEAR) is to implement a Programme of Activities (PoA), which installs off-grid micro hydro power plants (3kW~5kW) to provide electricity for farmer households living in Liangshan Yi Autonomous Prefecture (hereafter called Liangshan prefecture), Sichuan province on the upper reaches of the Yangtze river.

The targeted farmer households have not been covered by national/regional grid and they have continued to use fossil fuels or biomass for lighting, cooking and heating. A significant portion of the woody biomasses used in the households belong to non-renewable biomasses which generate a variety of gases including Carbon Dioxide (CO₂), one of the six Greenhouse Gases (“GHG”) covered under the Kyoto Protocol (“KP”) of the United Nations Framework Convention to Climate Change (“UNFCCC”).

The coordinating/managing entity (CME) of the PoA is Junenghuili Carbon Capital Management (Beijing) Co., Ltd. (called Junenghuili hereafter) and PEAR is the CER buyer and the PoA developer. Junenghuili is responsible for coordinating the efforts of entities involved in the PoA to promote the programme in Liangshan prefecture, Sichuan province. Corresponding nature reserve centers are the operators and implementers of the CPAs under the PoA; however, they are not required to be project participants (as per Annex 29 to EB47 Report, paragraph 6, “the operators of individual CPAs are not required to be project participants”). The inclusion of any new CPA to the PoA will be requested by Junenghuili to a Designated Operational Entity (DOE) during the lifetime of the PoA.

The first CPA is to install 120 micro hydro power plants in Shengguozhuang Nature Reserve and its ambient area, Yuexi County of Liangshan prefecture. The electricity generated will be used for lighting, cooking and heating purposes of the households.

A micro hydro power plant system with 3kW may provide electricity for one household for lighting, cooking and heating. However, CPAs under the PoA claims for CO₂ emission reduction only from the reduced non-renewable biomass used at households for cooking and heating.

The PoA will contribute to reduce de-forestation, as the renewable energy will be used to replace non-renewable biomasses consumed in the households and also to improve indoor air quality of the households through reducing black carbons and other pollutants from burning of the biomasses.

A.3. CMEs and participants of PoA

Junenghuili is the CME of the PoA, which communicates with the CDM Executive Board.

Corresponding nature reserve centers are the operators and implementers of the CPAs under the PoA. However, they are not required to be project participants (as per Annex 29 to EB47 Report, paragraph 6, “the operators of individual CPAs are not required to be project participants”).

PEAR also is a participant of the PoA as being the CER buyer and the PoA developer.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Junenghuili Carbon Capital Management (Beijing) Co., Ltd.	No
Japan	PEAR Carbon Offset Initiative, Ltd.	No

A.5. Physical/ geographical boundary of the PoA

The PoA covers Liangshan prefecture, Sichuan provinces in the upper reaches of the Yangtze River. The geographical coordinates of the PoA boundary is 100° 03' - 103° 52' east longitude and 26° 03' - 29° 18' north latitude.

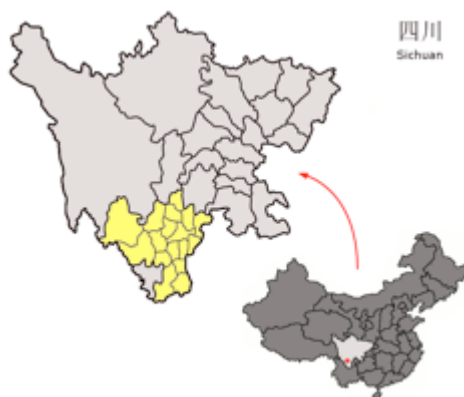


Figure 1: Boundary of the PoA (Area in yellow)

A.6. Technologies/measures

The PoA will install micro hydro power plants on the water systems in Liangshan prefecture, Sichuan provinces. The whole project activity comprises installation of micro hydro power plants, distribution lines and related constructions.

Generally, one 3kW micro hydro power plant system will provide electricity to a household for lighting, cooking and heating.

Micro hydro power plant systems generally consist of the following components

- A diverting stream to lead water from main river to the turbine

- A lock (water gate) to control water flow to the diverting stream.
- A trash rack to prevent debris from entering the diverted stream and turbine
- Penstock to pipe water to the turbine
- A powerhouse that contains the turbine and electronics
- A water turbine that conveys the kinetic energy of the flowing water into mechanical energy that can be used directly or to drive a generator or other piece of equipment- this is the main component of a micro hydro system
- A tailrace to release the water back into the source it came from
- Transmission lines to deliver electrical power where it is needed

Figure 2 below shows the main components of the micro hydro plant system. The system requires no water storage but instead it diverts some of the water from the river or stream which is channeled along the side of a valley before being dropped into the turbine.

There are various other configurations, which can be used on the topographical and hydrological conditions, but all adopt the same general principle. To produce enough power it is necessary to determine both of the flow rates of the water and head through which the water can be made to fall. The flow rate is the quantity of water flowing past a point in a given time. Typical flow rate unit is cubic meters per second.

In order to adequately assess the minimum continuous power output to expect from the hydropower system, it needs to determine the minimum quantity of water that will pass through it. For this reason, it is important to know both the minimum flow rate of stream and what portion of this flow you can use for power generation based on the seasonal variations of the stream. It is always important to divert minimum flow for power generation, especially when it will have an impact on fish migration and stream ecology. The head is the vertical height, in meters from the turbine up to the point the water enters are determine the penstock or water tank.

For the project, axial turbines (micro hydro power plant) with the following applicable conditions are applied.

Phase: single

Voltage: 200~230 V

Flow rate: 0.03~0.4 m³/second

Head: 1~8 m

Working environment temperature: -20 ~ 60 Celsius degree

Thus, the typical flow rate of the diverted stream is 0.2 m³/second and the head is designed to be 3 meters.

Power generation of micro hydro power plants is adjusted automatically within the range of 200~230 V subject to water flow that is controlled by a lock (water gate) installed at the entrance of diverted stream from the river. Households control the locks as to their energy demand.

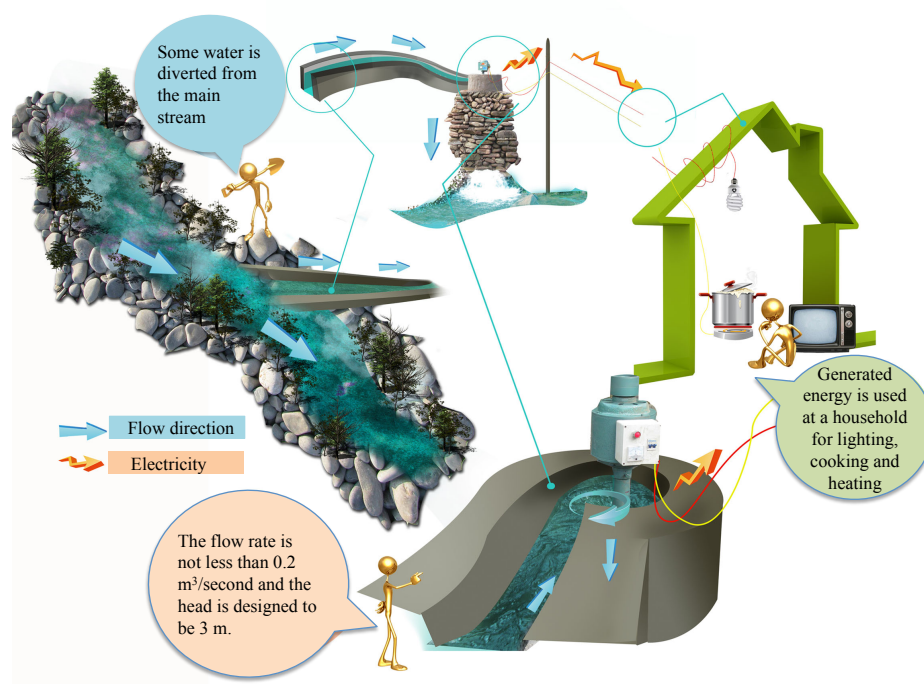


Figure 2. The Scheme of the Micro Hydro Technology

The configuration of installation of the power plants is given in the figure 3 below.

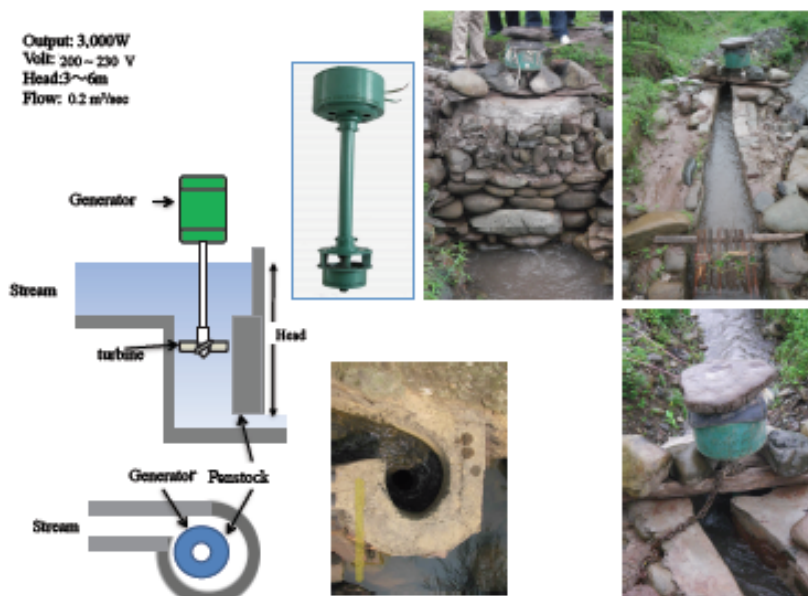


Figure 3: The Micro Hydro Power Plant Installation

A.7. Public funding of PoA

The PoA does not depend on any public funding. In case any CPA under the PoA avails of any public funding, it will be required to provide in its CPA-DD that no official development assistance is diverted to that public funding.

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

So far, Junenghuili has provided a lot of effective technical support and consultation to many programmes, which supported by international organizations, and done substantial works for rural sustainable development in China. However, Junenghuili has not obliged or mandated to implement such kind of programmes; Junenghuili is willing to voluntarily promote the programme as a coordinating entity with a condition of getting help from CDM carbon fund and other carbon fund investment.

The PoA is a voluntary programme by Junenghuili and the programme would not be implemented without CDM activity. Households under the PoA are indigent households and are hardly to afford not only the installation cost of power plants but also the operation cost of micro hydro power plants due to significant maintenance cost for the power plants. The CER benefit from the project would be used for project expansion and maintenance of the power plants. The CER benefit is a precondition for the programme implementation from perspectives of both of fund providers and Junenghuili itself.

Therefore, without the PoA, the voluntary action of promoting micro hydro power plants in the mountainous area of the Liangshan prefecture would not occur.

The demonstration of additionality for each CPA will be provided as per “GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 09)” approved in the 68th meeting of EB in each CPA-DD correspondingly.

The paragraph 2 of the Guidelines provides the positive list technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:

....

(b) *The following off-grid electricity generation technologies where the individual units do not exceed the thresholds indicated in parentheses with the aggregate project installed capacity not exceeding the 15 MW threshold:*

- (i) *Micro/pico-hydro (with power plant size up to 100 kW);*
- (ii) *Micro/pico-wind turbine (up to 100 kW);*
- (iii) *Micro/pico-wind turbine (up to 100 kW);*
- (iv) *Geothermal (up to 200 kW);*
- (v) *Biomass gasification/biogas (up to 100 kW);*

Each CPA under the PoA covers micro hydro power plants with capacity not more than 5kW and supplies energy to households in off-grid area. Therefore, any CPA under the PoA is seen to be additional.

B.2. Eligibility criteria for inclusion of a CPA in the PoA

The CME has established the eligibility criteria in accordance with EB 74 Annex 5, “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” for the implementation of the PoA, as follows:

Table 1: Eligibility Criteria

No	Requirements for Eligibility Criteria	Eligibility Criteria	Conformity Yes or No
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a	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA.	1. A CPA locates in Liangshan Prefecture in Sichuan Province on the upper reaches of the Yangtze River.	Each CPA will demonstrate the conformity of the eligibility criteria
b	Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)	2. A CPA includes installation/construction of micro hydro power plants and their related equipment. And micro hydro power plants and households under the CPA should have the CPA specific identifications such as serial numbers for avoiding double counting of emission reductions.	Each CPA will demonstrate the conformity of the eligibility criteria
c	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications;	3. The CME is responsible for purchasing micro hydropower plants/generators and their related equipment for each CPA through screening their specifications and checking installation of each micro hydro power plant and inspecting their operation conditions.	Each CPA will demonstrate the conformity of the eligibility criteria
d	Conditions to check the start date of the CPA through documentary evidence;	4. The start date of each CPA being defined as the date of construction started and contracts of the construction will be used to documenting start dates of CPAs.	Each CPA will demonstrate the conformity of the eligibility criteria
e	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs;	5. Each CPA should meet the applicability and other requirements of AMS- I.E (version 05).	Each CPA will demonstrate the conformity of the eligibility criteria
f	The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality	6. For additionality demonstration, “GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 09)” is applied.	Each CPA will demonstrate the conformity of the eligibility criteria
g	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis.	7. Local stakeholder consultation is conducted at a CPA level and related environmental impacts are discussed during the consultation.	Each CPA will demonstrate the conformity of the eligibility criteria
h	Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;	8. Funding from Annex I parties that is used for the PoA does not result in a diversion of official development assistance.	Each CPA will demonstrate the conformity of the eligibility criteria

i	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	9. Each CPA targets off-grid households and provides energy for lighting, cooking and heating to replace woody biomass consumed at households for cooking and heating in the absence of the project activity.	Each CPA will demonstrate the conformity of the eligibility criteria
j	Where applicable, the conditions related to sampling requirements for the PoA in accordance with the “Standard for sampling and surveys for CDM project activities and programme of activities”;	10. Ex-ante and ex-post statistical samplings as per “General guidelines for sampling and surveys for small-scale CDM project activities” and “Standard for sampling and surveys for CDM project activities and PoAs” are applied for parameters of CPAs.	Each CPA will demonstrate the conformity of the eligibility criteria
k	Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA;	11. Any CPA under the PoA clears the criteria for small- scale CDM projects.	Each CPA will demonstrate the conformity of the eligibility criteria
l	Where applicable, the requirements for the de-bundling check, in case the CPAs belong to small-scale or micro scale project categories.	12. A CPA is not a part of a registered CDM project or not a CPA under another PoA.	Each CPA will demonstrate the conformity of the eligibility criteria

B.3. Application of methodologies

The methodology applied for CPA under the PoA is:

Scope No: 1

Sectoral scope: Renewable energy

Category: AMS-I.E. (Switch from non-renewable biomass for thermal applications by the user)

Version: 05

This methodology comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).

The conformity of PoA in line with applicability conditions in the AMS-I.E. is described in the following table.

Table 2: Justification of Applicability of the Methodology

Applicable conditions	Justifications
AMS-I.E.	
1. This category comprises activities to displace the use of non-renewable biomass by	1. CPAs under the PoA will introduce micro hydro power plants for providing households

<p>introducing renewable energy technologies. Examples of these technologies include but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).</p>	<p>renewable energy to replace woody biomass (most portion of the woody biomass are non-renewable biomass) used at the households for cooking and heating purposes.</p>
<p>2. Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.</p>	<p>2. China is the second largest energy consumer in the world with 1.7 billion tons of oil equivalent in 2006 or 15.6 % of the World consumption. Despite the fact that 96% of the population is connected to the grid, 700 million people in rural areas are still using forest biomass and agricultural residues to meet nearly 90% of their energy needs; particularly in Southwestern China (including the PoA boundary). The vast majority of China's bioenergy is used for cooking and heating in rural areas, where it is the dominant source of energy and is often burned in low efficiency stoves in what is commonly referred to as "traditional" biomass use¹. Collection of fuel wood, which is permitted under the National Natural Forest Protection Program. But year round heating, cooking requires large volumes of fuel wood. Before logging band (Chinese government banned logging in upper Yangtze forests including in the giant panda's habitat in 1998) a substantial percentage of fuel wood collected from logging slash on forests. Now farmers are forced to rely more heavily on their own collective forests. In most areas, these forests are not managed in sustainable ways. The households in mountainous area of Sichuan province including Shen'guozhuang Nature Reserve and its ambient area have traditionally frequently collected fuel wood for cooking and heating from their collective and other forests. This kind of life style is a common practice in most remote mountainous area in China from the history to present.</p>
<p>3. The total installed electricity generation capacity of any CPA shall be smaller than 15 MW.</p>	<p>3. Since each micro power plant system of any CAP under the PoA is 3 kW~5kW. And the number of power plants in a CPA is controlled to be sure the total capacity of a CPA should</p>

¹ RE-IMPACT: FOREST BASED BIOENERGY FOR SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES, Jaime M. Amezaga, Jennifer Harrison, Centre for Land Use and Water Resources Research (CLUWRR), School of Civil Engineering and Geosciences New Castle University.

	not exceed 15MW. That is, the number of micro hydro power plants under a CPA should not exceed 3,000.
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SECTION C. Management system

(1) Generic description of the operation and management system:

Junenghuili is in charge of coordinating all entities involved in the PoA, together with CPA implementers collecting necessary data and information from each CPA and also communicating with DOE and CDM Executive Board.

Local nature reserve management centers or local wildlife conservation entities are CPA implementers. They are responsible for monitoring and provide data and information to Junenghuili who will record the probed data electronically and calculate emission reduction.

Households who voluntarily participate the CDP project will be trained on management and safety issues of power plant operation and have to sign agreements with the CPA implementers to promise properly operate and maintain the power plants.

Local nature reserve management centres or local wildlife conservation entities that are interested in the PoA will contact to Junenghuili for participating the PoA. The Junenghuili will send CDM management team to the fields and make an initial report on eligibility of a CPA. The management structure is given in the figure 4 below and roles and responsibilities of personnel involved in the CDM management system are given in the table 3 below.

The CDM management team leader will pass the report to the CEO of Junenghuili and PEAR also. Based on the report and confirmation of PEAR, CEO of Junenghuili will decide inclusion of CPAs.

Then Local nature reserve management centres or local wildlife conservation entities will sign agreements with Junenghuili for being CPAs and providing all relevant information.

Junenghuili CDM management team will provide training in operation and maintenance of micro hydro power plants to supervisors and CDM responsible people of Local nature reserve management centres or local wildlife conservation entities.

Moreover, Junenghuili will provide training program before monitoring of CDM activities to CPA implementers once in a year. Training program details will keep record as hard copy according to CPA number.

Table 3: Roles and Responsibilities of Personnel Involved in the CDM Management System

Designation	Tasks	Experiences/Management Level	Competencies
CDM management team leader	<ul style="list-style-type: none"> Communicate with parties who are interested in participation of the PoA. With a help of PEAR, Check the initial report from the team and finalize the report. Check other reports on data and information 	High	<ul style="list-style-type: none"> Should have understanding of CDM Rules, Methodology tools and guidelines related to the PoA. Basic technical knowledge of micro hydropower generation. Must have deep

	<ul style="list-style-type: none"> • With the help of PEAR, arrange trainings and capacity buildings for CPA implementers on CDM. • Provide and report relevant information on the PoA to CPA implementers. 		knowledge of all stages of CDM process
CDM management member	<ul style="list-style-type: none"> • Develop initial reports on CPAs • Collect data and information on CPAs. • Develop relevant reports on CPAs. 	High	<ul style="list-style-type: none"> • Should have understanding of CDM Rules, Methodology tools and guidelines related to the PoA. • Basic technical knowledge of micro hydropower generation. • Skills in excel and other related tools

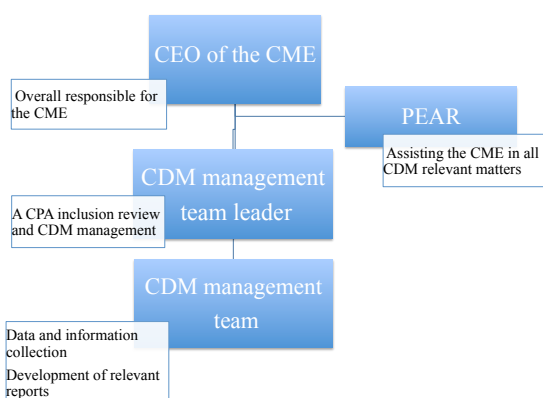


Figure 4: Structure of the Management System

(2) A record keeping system for each CPA under the PoA:

A well-designed record keeping system in full compliance with all relevant guidelines and regulations of the CDM EB and the Chinese DNA² will be operated for a timely completion of all activities in line with the project schedule and in accordance with the project objectives. The record keeping system consists of the method of data survey, the duty and roles of each participants and the database including but not limited to schedule and serial number for each CPA, objective area, size of each CPA, all necessary information/data of every single household and power plant in each CPA including:

- Name of targeted household representative, address and other household-related information
- Fuel consumptions (especially before reaching electricity)

² These include “General Guidelines to SSC CDM methodologies”, “Guidelines on Assessment of Debundling for SSC Project Activities”, “General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities” and related measures for operation and management of Clean Development Mechanism Projects in China

- Serial number of micro hydro power plants
- Operation days of power plants
- Status of operation of each power plant
- Status of compliance with related standards and regulations

The database is to be completed by Junenghuili and CPA implementers through ex ante and ex post sample or an entire survey toward the households in the CAPs

For the sample survey, the CME develops a random sample method with 90/10 confidence/precision as per the standard for Guideline (Sampling and surveys for CDM project activities and programmes of activities, Version 03.0). Collection of key information for ex ante determination of the baseline emission will be conducted by Junenghuili and CPA implementers in the form of questionnaires that integrates application for voluntarily participating to the PoA and related information for ex ante determination of baseline emissions. Households who voluntarily apply to join a CPA are required to provide related information of fuel consumption, household income, and other household-related data with possible evidences.

Related responsibilities and tasks of different players under the record keeping system are described in the table below.

Table 4: Responsibilities and tasks of players involved in the PoA

	Players	Processes
Coordination of the PoA including the process if inclusion of CPAs	Junenghuili	<ul style="list-style-type: none"> • Coordinate between implementers and PEAR and CDM Executive Board • Develop a PoA management system that includes technical review for inclusion of CPAs; select and contract with CPA implementers. • Apply for the registration of the PoA and inclusion of any CPA to CDM Executive Board
	Each CPA implementer	<ul style="list-style-type: none"> • Apply for participation of the PoA as an implementer. • Provide all relevant data and information regarding inclusion of a CPA.
Ex ante and ex post data collection	Junenghuili	<ul style="list-style-type: none"> • Specify the required data/information to be collected before start and/or during implementation of each CPA. • Develop database format for CPAs
	Each CPA implementer	<ul style="list-style-type: none"> • Conduct data collection from its CPA
Data storage and management	Junenghuili	<ul style="list-style-type: none"> • Develop database for CPAs. • Check the reported data from each CPA implementer. • Calculate emission reductions based on the data reported by implementers. • Compile and store data and information as a database.

	Each CPA implementer	<ul style="list-style-type: none"> • Store the electronic and hard copy of the data and information. • Provide the electronic or hard copy file to CME.
Communication and reporting	Junenghuili	<ul style="list-style-type: none"> • Coordinate between implementers and communicate with DOE and CDM EB
	Each CPA implementer	<ul style="list-style-type: none"> • Report collected data and information to the CME
Training and capacity building	Junenghuili	<ul style="list-style-type: none"> • Implement training programs for its own staffs and implementers to meet the needs of the monitoring and verification.
Quality assurance and verification	Junenghuili	<ul style="list-style-type: none"> • Double check data related to inclusion and monitoring between Junenghuili and PEAR.
	Each CPA implementer	<ul style="list-style-type: none"> • Undertake regular maintenance of micro hydro plants in accordance with the specifications and requirements. • Keep record for all data and information of project activities.
PDCA cycle	Junenghuili	<ul style="list-style-type: none"> • Review each of CPA, the PoA as a whole annually and assess the performance PoA management system with feedbacks from implementers. • If necessary, revisions are to be done to the management system.

(3) A system/procedure to avoid double accounting e.g., to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA:

The system for avoiding double accounting or being an already registered CDM project activity or a CPA of another PoA is given below.

Step 1. Check CDM home page of Chinese DNA and UNFCCC, if there is any CDM project activity which applies the same technology with the CPA and targets the same area with the CPA or any PoA that applies the same technology with the CPA and targets same areas.

Step 2 (a). If there is no any CDM project or PoA, then double counting doubt will be cleared and the CPA will be included in the PoA.

Step 2 (b). If there is any CDM projects or PoA, then go to the next step.

Step 3. Check if the CDM project has the same project implementer with the CPA and includes the same households with the CPA or the PoA has the same programme coordinator with the CPA and covers the same households with the CPA.

Step 4 (a). If the answer of step 3 is yes, then the CPA will be excluded from the PoA.

Step 4 (b). If the answer is no, then the CPA will be included in the PoA.

(4) The SSC-CPA included in the PoA is not a de-bundled component of another CPA or CDM project activity:

According to “Guidelines on Assessment of De-bundling for SSC Project Activities (ver. 03)”,³ it is specified that:

If each of the independent subsystems/measures (e.g., biogas digesters, residential solar energy systems, kerosene or incandescent lighting replacements) included in one or more CDM project activities is no greater than 1% of the small scale thresholds defined by the applied methodology and the subsystems/measures are indicated in the PDDs to be each implemented at or in multiple locations (e.g., installed at or in multiple homes) then these CDM project activities are exempted from performing a de-bundling check, i.e., considered as being not a de-bundled component of a large scale activity.

Each sub-system under a CPA under the PoA is designed to be no more than 5 kW, which is lower than the 1% of the threshold of small scale (15 MW) is 150 kW. Therefore, any CPA of the PoA is exempt from performing a de-bundling check.

(5) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA:

As explained in table 2 above, under the record keeping system, the operators of CPAs are well aware of and have agreed to their activity under the PoA. Furthermore, provisions speculated in the agreements that require mutual reporting between project participants ensure awareness and understanding of any project activities between project participants and CPA operators. For instance, any CPA under the PoA is recommended and planned by Junenghuili and PEAR.

³ http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf.

**SECTION D. Duration of PoA****D.1. Start date of PoA**

The starting data of the PoA is 26/05/2011 on which construction of the first CPA is started through gaining of “Approval Letter of Commencement” by Local Government

D.2. Length of the PoA

28 years

SECTION E. Environmental impacts**E.1. Level at which environmental analysis is undertaken**

Environmental analysis is done at SSC-CPA level.

E.2. Analysis of the environmental impacts

The project is expected to provide positive environmental impacts as follows.

Change fuel consumption structure of households

Non-renewable biomasses used at the households will be replaced by clean energy generated by the project. The replacement will lead the reduction of greenhouse gas and contribute to forest conservation and bio-diversity in the target area.

Improve life condition of households

The project will provide electricity to the households in the project area where households have not been reached to electricity and provide clean energy for cooking and heating.

Health benefits:

A major problem for rural people especially for the housewives is indoor air pollution due to exposures to smoke inside the kitchen while cooking with biomass.

Poor indoor air quality (especially black carbon) is one of the major risks factors for acute respiratory infections especially with housewives and children. The project reduces the smoke exposures and significantly improves the air condition inside the kitchen which will ultimately improve the health conditions by reducing the incidences of eye infection, respiratory diseases, coughing, dizziness and headache.

The micro hydro power plant promotion projects are seen to have no negative impacts on the environment; however, environmental impact clearance certification should be gained from corresponding county's Environmental protection bureau through submitting registration and application form with some relevant descriptions at a CPA level.

Please refer to specific CDM SSC-CPA_DD, which includes how the environmental analysis was done.

SECTION F. Local stakeholder comments**F.1. Solicitation of comments from local stakeholders**

Local stakeholder consultation is done at SSC-CPA level.

F.2. Summary of comments received

Please refer to specific CDM SSC-CPA_DD, which includes how comments by local stakeholders have been invited.

F.3. Report on consideration of comments received

Please refer to specific CDM SSC-CPA_DD, which gives how comments were taken into account.

SECTION G. Approval and authorization

The Letter of Approval from both host country (China) and Japan were issued already.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The CPAs under the PoA aim to install micro hydro power plants (3kW~5kW) to provide electricity for off-grid farmer households in Liangshan Yi Autonomous Prefecture, Sichuan Province on the upper reaches of the Yangtze River.

The aim of the CPA is to contribute to the sustainable development of rural China as the CPAs will contribute to reduce de-forestation, as the renewable energy will be used to replace non-renewable biomasses consumed in the households and also to improve indoor air quality of the households through reducing black carbons and other pollutants from burning of the biomasses.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology (ies) selected

Table 5: List of Baseline and Monitoring Methodologies

Baseline and Monitoring Methodology	AMS-I.E. Switch from non-renewable biomass for thermal applications by the user	Version 05 Sectoral Scope: 01 EB 68
Tools and Guidelines	Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities	EB 74 Report, Annex 5, Version 03.0
	GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES	EB 68 Report, Annex 27, Version 9
	Guidelines on assessment of de-bundling for SSC project activities	EB 54 Report, Annex 13, Version 3
	GUIDELINES FOR COMPLETING THE PROGRAMME DESIGN DOCUMENT FORM FOR SMALL-SCALE CDM PROGRAMMES OF ACTIVITIES	EB 74 Report, Annex 08, Version 03.0

	GUIDELINES FOR COMPLETING THE COMPONENT PROJECT DESIGN DOCUMENT FORM FOR SMALL-SCALE COMPONENT PROJECT ACTIVITIES	EB 66 Report, Annex 17, Version 01.0
	Standard: Sampling and surveys for CDM project activities and programme of activities	EB 50 Report, Annex 30, Version 04.0

B.2. Application of methodology (ies)

The methodology of AMS-I.E (Switch from non-renewable biomass for thermal applications by the user 05) is applied for CPAs under the PoA and a justification of applicability of the methodology is given in the table 5 below. CPA-specific conformity or compliance with the eligibility criteria will be assessed at the time of its inclusion.

Table 6: Justification of Applicability of the Methodology

Applicable conditions	Justifications
AMS-I.E.	
<ol style="list-style-type: none"> This category comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass). Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics. 	<ol style="list-style-type: none"> CPAs under the PoA will introduce micro hydro power plants for providing households renewable energy to replace woody biomass (most portion of the woody biomass are non-renewable biomass) used at the households for cooking and heating purposes. China is the second largest energy consumer in the world with 1.7 billion tons of oil equivalent in 2006 or 15.6 % of the World consumption. Despite the fact that 96% of the population is connected to the grid, 700 million people in rural areas are still using forest biomass and agricultural residues to meet nearly 90% of their energy needs; particularly in Southwestern China (including the PoA boundary). The vast majority of China's bioenergy is used for cooking and heating in rural areas, where it is the dominant source of energy and is often burned in low efficiency stoves in what is commonly referred to as "traditional" biomass use⁴. Collection of fuel wood, which is permitted under the National Natural Forest Protection

⁴ RE-IMPACT: FOREST BASED BIOENERGY FOR SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES, Jaime M. Amezaga, Jennifer Harrison, Centre for Land Use and Water Resources Research (CLUWRR), School of Civil Engineering and Geosciences New Castle University.

<p>3. The total installed electricity generation capacity of any CPA shall be smaller than 15 MW.</p>	<p>Program. But year round heating, cooking requires large volumes of fuel wood. Before logging band (Chinese government banned logging in upper Yangtze forests including in the giant panda's habitat in 1998) a substantial percentage of fuel wood collected from logging slash on forests. Now farmers are forced to rely more heavily on their own collective forests. In most areas, these forests are not managed in sustainable ways. The households in mountainous area of Sichuan province including Shen'guozhuang Nature Reserve and its ambient area have traditionally frequently collected fuel wood for cooking and heating from their collective and other forests. This kind of life style is a common practice in most remote mountainous area in China from the history to present.</p> <p>3. Since each micro power plant system of any CAP under the PoA is 3 kW~5kW. And the number of power plants in a CPA is controlled to be sure the total capacity of a CPA should not exceed 15 MW. So, the number of micro hydro power plants should not be more than 3,000 in a CPA.</p>
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B.3. Sources and GHGs

Table 7: Emission Sources and GHG Considered for Baseline and Project

	Source	Gas	Included?	Justification / Explanation
Baseline	Emissions from combustion of fossil fuel for meeting similar thermal energy needs ⁵	CO ₂	Yes	Major emission source
		CH ₄	No	Not significant. Excluded for simplification and conservativeness
		N ₂ O	No	Not significant. Excluded for simplification and conservativeness
Project	Emissions from use of electricity generated by micro hydro power plants for cooking and heating	CO ₂	No	Zero emission
		CH ₄	No	Zero emission
		N ₂ O	No	Zero emission

⁵The most plausible baseline fuel is continuation of current practice, i.e., non-renewable biomass (fuel wood). Therefore, theoretically it is correct to use the CO₂ emission factor of the non-renewable biomass in the calculation of emission reductions. However, the methodology does not allow using such emission factor but requests to use that of (most plausible) fossil fuel by assuming that the use of such fossil fuel is the baseline scenario (para.4 of the methodology).

Historical background of this un-theoretical treatment is the requirement by the Marrakech Accords (Modalities and Procedures for CDM; Decision 17/CP.7): "(CMP) decides: (a) That the eligibility of land use, land-use change and forestry project activities under the clean development mechanism is limited to afforestation and reforestation"

The elements included and energy flows in the project boundary (within the red line) is shown in the figure below.

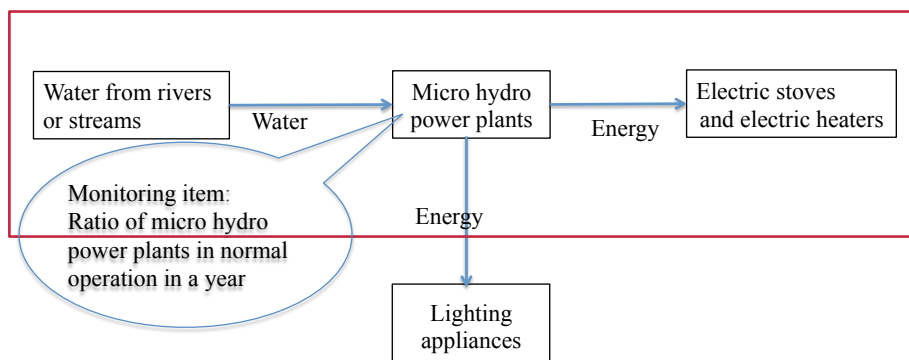


Figure 5: Micro Hydro Power Plant System Boundary

B.4. Description of baseline scenario

The baseline scenario for AMS-I.E. can be determined as follows.

The alternatives to the project activity consistent with mandatory laws and regulations are given as follows.

- Continuation of current practice that use of biomass for cooking and heating, fossil fuel for lighting
- Get electricity from standalone off grid power plant, which uses renewable energy like solar, wind other than hydro.
- Get electricity from national/regional grid.
- Implementation of the project without CDM

Options (a) continuation of current practice is the most viable scenario for households in the targeted area. On the other hand, option (b) is not going to happen because of conditions for wind and solar energy not satisfied in the targeted area.

(para. 7). Switching from non-renewable biomass to renewable energy is to reduce CO₂ but it may be recognized also as a “land use, land-use change and forestry”-type project activity.

After two years’ negotiations, CMP 3 decides that “24. (CMP) Requests the Executive Board to approve, at its first meeting in 2008, the simplified methodologies for “Switch from non-renewable biomass for thermal application by the user” and “Energy efficiency measures in thermal applications of non-renewable biomass”, as recommended by the Executive Board, for use for clean development mechanism project activities, as contained in annexes 3 and 4 to document FCCC/KP/CMP/2007/3 (Part II), incorporating the necessary changes to ensure that the application of these methodologies introduces new or improves existing end-user technologies and that, in the case of the methodology “Energy efficiency measures in thermal applications of non-renewable biomass”, the baseline energy efficiency is measured or is based on referenced literature values” (Decision 2/CMP.3).

Therefore, a skewed treatment is incorporated in the methodology such as “It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs (Paragraph 5 of AMS- I.E, ver.03)” even if the real baseline scenario is continuation of use of non-renewable biomass. The “CDM methodology booklet” prepared by the CDM Secretariat also shows that the real baseline is continuation of non-renewable biomass use.

In the case option (c), it is also difficult to be realized. As a consequence of China's efforts, the national electrification rate in 2009 was 99.4%, with rural areas reaching 99% and urban areas 100%⁶ (IEA, 2009b).

The traditional approach to providing electricity to rural areas is mainly through grid extension needs long transmission lines that often result in a small load and huge line losses. At present, most regions without electricity are located in western regions and islands in the eastern coastal areas, far away from the grid. Most of these areas are rich in renewable energy resources (hydropower, solar and wind energy), which can practically and economically provide electrification to remote regions.

In rural China, electricity is supplied through three channels: a county is connected to a national grid, or is supplied through local dispatch, or is self-supplied. Following this pattern, China implemented the "Brightness Programme" and the "County Hydropower Construction of National Rural Electrification", using small hydropower, wind and solar power generation for the electrification of rural areas.

However, through the deployment of decentralized power systems, the government aims to supply 10 million people with electricity by the end of 2020. The government however expects that beyond 2020 some Chinese households will still be lacking electricity.

Therefore, accessing to national/regional grid for the targeted area (remote mountainous area) is not a viable scenario.

Option (d) is also difficult to be realized due to economical and technical barriers of introducing micro hydro power plants that sufficiently supply electricity for lighting, cooking and heating.

In the project area, there were some households who installed low cost micro hydro plants (mainly 1kW) for lighting by themselves; however, it was reported that the most plants had not worked well with frequent malfunctions. The reasons for that were the inappropriate installation and operation of power plants in addition to the low quality of low cost hydro power plants themselves.

The cost for installing and constructing of 3kW hydro power plant reaches 8,000 RMB while the households' average annual per capita income is lower than 2,000 RMB. Furthermore, technical barriers exist for households to give power plants efficient run such as proper design and appropriate installation.

Therefore, the baseline scenario for CPAs under the PoA is the continuation of current practice.

B.5. Demonstration of eligibility for a generic CPA

All CPAs are eligible under the PoA, if the CPA complies with the following criteria:

Table 8: Demonstration of Eligibility Criteria

No	Eligibility Criteria	Conformity Yes or No
1	A CPA locates in Liangshan Prefecture in Sichuan Province on the upper reaches of the Yangtze River.	Each CPA will demonstrate the conformity of the eligibility criteria
2	A CPA includes installation/construction of micro hydro power plants and their related equipment. And micro hydro power plants and households under the CPA should have the CPA specific identifications such as serial numbers for avoiding double counting of emission reductions.	Each CPA will demonstrate the conformity of the eligibility criteria
3	The CME is responsible for purchasing micro hydropower plants/generators and their related equipment for each CPA through screening their specifications and checking installation of each micro hydro power plant and inspecting their operation	Each CPA will demonstrate the conformity of the eligibility criteria

⁶ IEA (2009), World Energy Outlook. Paris: International Energy Agency.

	conditions.	
4	The start date of each CPA being defined as the date of construction started and contracts of the construction will be used to documenting start dates of CPAs.	Each CPA will demonstrate the conformity of the eligibility criteria
5	Each CPA should meet the applicability and other requirements of AMS- I.E (version 05).	Each CPA will demonstrate the conformity of the eligibility criteria
6	For additionality demonstration, “GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 09)” is applied.	Each CPA will demonstrate the conformity of the eligibility criteria
7	Local stakeholder consultation is conducted at a CPA level and related environmental impacts are discussed during the consultation.	Each CPA will demonstrate the conformity of the eligibility criteria
8	Funding from Annex I parties that is used for the PoA does not result in a diversion of official development assistance.	Each CPA will demonstrate the conformity of the eligibility criteria
9	Each CPA targets off-grid households and provides energy for lighting, cooking and heating to replace woody biomass consumed at households for cooking and heating in the absence of the project activity.	Each CPA will demonstrate the conformity of the eligibility criteria
10	Ex-ante and ex-post statistical samplings as per “General guidelines for sampling and surveys for small-scale CDM project activities” and “Standard for sampling and surveys for CDM project activities and PoAs” are applied for parameters of CPAs.	Each CPA will demonstrate the conformity of the eligibility criteria
11	Any CPA under the PoA clears the criteria for small- scale CDM projects.	Each CPA will demonstrate the conformity of the eligibility criteria
12	A CPA is not a part of a registered CDM project or not a CPA under another PoA.	Each CPA will demonstrate the conformity of the eligibility criteria

B.6. Estimation of emission reductions of a generic CPA

B.6.1. Explanation of methodological choices

Methodological choices selected for a typical SSC-CPA are as follows:

AMS-I.E. Switch from non-renewable biomass for thermal applications by the user / version 05

According to the methodology, the baseline is defined as the absence of the project activity; the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs (Paragraph 4).

And emission reduction is calculated based on the equation as below as for paragraph 5.

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} - LE_y \quad (1)$$

Where:

ER_y : Emission reduction during the year y in ton CO₂/year.

B_y :	Quantity of woody biomass that is substituted or displaces in tons.
$f_{NRB,y}$:	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable woody biomass ($f_{NRB,y}$) values are available on the CDM website ⁷ .
$NCV_{biomass}$:	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/ton).
$EF_{projected_fossilfuel}$:	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 ton-CO ₂ /TJ ⁸ .
LE_y	: Leakage in a year y (ton/year)

The $f_{NRB,y}$ is defined at CPA level as:

$$f_{NRB,y} = \frac{NRB}{NRB + DRB} \quad (2)$$

Where,

NRB : Share of non-renewable woody biomass used in the absence of the project activity (ton/year).
 DRB : Share of (demonstrably) renewable woody biomass used in the absence of the project activity (ton/year).

B_y is determined by using the following options.

(a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (ton/year); This can be derived from historical data or estimated using survey methods; or

It is noted that SSC_538 clarified that

The SSC WG agreed to clarify that the expression “per appliance” does not preclude the survey to be done “per household”. As long as it is known how many appliances there are in the surveyed households, the data per household may be used in the calculation.

However, the data per household may need to be corrected if the service provided by the project technology is only part of the service provided by the biomass in the baseline, e.g. a biogas cooking stove is introduced whereas biomass in the baseline has been used for both cooking and room heating.

Then the B_y is determined as:

⁷ Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>.

⁸ This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO₂ /TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO₂ /TJ for kerosene and 63.0 tCO₂ /TJ for liquefied petroleum gas (LPG)).

$$B_y = R_{O,y} \times \sum_i^N B_{i,y}^{BL} \quad (3)$$

Where

$B_{i,y}^{BL}$: The quantity of woody biomass that is used by a household i in baseline in year y .

$R_{O,y}$: Ratio of micro hydro power plants in normal operation in a year

N : The number of target households (in principle, each household has one micro-hydro power plant).

$B_{i,y}^{BL}$ is determined ex-ante based on the baseline survey (sample or census) toward target households under each CPA.

As per the paragraph of 18 (option (c)) of the methodology, the leakages from CPAs are treated as applying 0.95 adjustment factor (Af) for adjusting the B_y .

18. *The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and, if required, on a sample basis using a 90/30 precision for selection of samples, and accounted for:*

...

(c) As an alternative to subparagraphs (a) and (b), B_y can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

Then the leakage is calculated as follows.

$$LE_y = B_y \times (1 - Af) \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} \quad (4)$$

B.6.2. Data and parameters that are to be reported ex-ante

Data / Parameter:	$NCV_{biomass}$
Data unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass
Source of data used:	IPCC
Value applied:	0.015
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value from 2006 IPCC Guidelines for National Greenhouse Gas Inventories Chapter 1, Table 1.2
Any comment:	—

Data / Parameter:	$EF_{projected_fossilfuel}$
Data unit:	Ton CO ₂ e/TJ
Description:	Emission factor for substitution of non renewable woody biomass
Source of data used:	The methodology
Value applied:	81.6
Justification of the	AMS-I.E. Switch from non-renewable biomass for thermal applications by the



choice of data or description of measurement methods and procedures actually applied:	user, version 05; paragraph 5.
Any comment:	–

Data / Parameter:	$B_{i,y}^{BL}$
Data unit:	Ton/year
Description:	The quantity of woody biomass that is used by a household i in baseline in year y
Source of data used:	The CME
Value applied:	Dependent on each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied:	It is determined ex-ante through sample survey or census toward targeted households. In the case of sample survey, 90/10 (90% confidence interval and 10% margin of error) shall be assured.
Any comment:	–

Data / Parameter:	$f_{NRB,y}$
Data unit:	%
Description:	Fraction of woody biomass used in the absence of the project activity in year y
Source of data used:	Calculated by the CME
Value applied:	Dependent on each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied:	It can be established as non-renewable biomass using survey methods or official data.
Any comment:	–

Data / Parameter:	Af
Data unit:	%
Description:	Adjusting factor
Source of data used:	Methodology
Value applied:	95%
Justification of the choice of data or description of measurement methods and procedures actually applied:	AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user, version 05.
Any comment:	–

Data / Parameter:	N
Data unit:	Number
Description:	The number of target households

Source of data used:	The CME
Value applied:	Dependent on each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied:	The number of households and number of micro hydro power plants are identical that are grasped before project implementation and reflected in documents such as household list and procurement documents.
Any comment:	–

B.6.3. Ex-ante calculations of emission reductions

As per the formulae given in this PoA-DD Part II Section B 6.2, the ex-ante calculations of the energy savings and emission reductions are explained on each CPA.

B.7. Application of the monitoring methodology and description of the monitoring plan

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	$R_{O,y}$
Data unit:	%
Description:	Ratio of micro hydro power plants in normal operation in a year
Source of data to be used:	The CME
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Dependent on each CPA
Description of measurement methods and procedures to be applied:	The parameter is used to ensure that micro hydro power plants are still operating or are replaced by an equivalent in service appliances. The parameter is obtained through a survey in terms of sample survey or census toward target households and micro hydro power plants under each CPA. The survey is conducted twice a year and an average value of the surveys will be used.
QA/QC procedures to be applied:	In the case of sample survey, 90% confidence interval and 10% margin of error shall be assured.
Any comment:	-

B.7.2. Description of the monitoring plan for a generic CPA

1. Monitoring framework

Junenghuili will act as the overall supervisor of the PoA, and undertake aggregating the data, conducting necessary calculations of emission reductions and preparing a monitoring report periodically (typically annually) to the DOE.

The CPA implementers together with Junenghuili will undertake the monitoring of the CPA operations including household surveys based on the operation and monitoring manual prepared by the program coordinator. The CPA implementers have the responsibility to manage and operate the CPA.

Households who voluntarily participated in the CPAs are required to provide their related information to CPA implementers.

2. The Function of CME and CPA Implementers

The following table shows the roles of the CME and implementers for the monitoring.

	CME	CPA Implementers
Monitoring management	<ul style="list-style-type: none"> - Develop the operation and monitoring manual for the PoA. - Develop and establish data collection and reporting system for parameters monitored in every CPA. 	<ul style="list-style-type: none"> - Implementation and management of monitoring
Data collection	<ul style="list-style-type: none"> - Establish and maintain data collection systems for parameters monitored. - Check data quality and collection procedures regularly. 	<ul style="list-style-type: none"> - Implement data collection
Data storage and management	<ul style="list-style-type: none"> - Develop database for CPAs. - Check the reported data from each CPA - Calculate emission reductions based on the data reported by the implementers. - Store and maintain records. 	<ul style="list-style-type: none"> - Prepare electronic or hard copy data. - Store and maintain records.
Communication and reporting	<ul style="list-style-type: none"> - Coordinate between implementers and communicate with DOE and CDM EB - Analyze data and compare project performances. - Prepare and forward relevant reports. 	<ul style="list-style-type: none"> - Report collected data to the CME
CDM training and capacity building	<ul style="list-style-type: none"> - Implement training programs for implementers to meet the needs of the monitoring plan. 	<ul style="list-style-type: none"> - Ensure relevant staffs' training organized by CME.
Quality assurance and verification	<ul style="list-style-type: none"> - Develop operating and management system that ensures double checks for data and information collected. - Prepare, facilitate and coordinate verification process. 	<ul style="list-style-type: none"> - Undertake regular check of data and information collected - Undertake regular maintenance of micro hydro power plants.

3. Monitored data

The data to be monitored are described in section E.7.1 above.

4. Data collection

Data collection regarding monitoring will be carried out by CPA implementers. The role of Junenghuili in data collection is checking the quality of the data collected by CPA implementers.



Each CPA implementer shall undertake semi-annual survey to collect data, including confirmation of operation condition of micro hydro power plants and other household related information.

The survey can be sample survey or census toward households under the CPAs. The major data in the survey includes operation condition of micro hydro power plants and other related information of each household including name of representative and address. Please refer to Annex 6 for sampling plan.

As a condition of participating to the CPAs, households are required to provide related information and report any malfunctions of micro hydro power plants in time.

5. Data management

Data management is the most important step in the monitoring process to ensure transparent and credible emission reduction calculations.

Each CPA implementer shall collect data described in section E.7.1 and archive these electronically using the common template developed by the program coordinator. Data will be archived as soon as the census/sample survey is finished. The electronic files will be stored in hard disks as well as a hard copy printout. The electronic files and the hard copy shall be sent to Junenghuili.

Junenghuili will develop an appropriate electronic template for archiving all data of every CPA. After reporting data from each CPA, the program coordinator shall verify and certify the data. If there are any errors found, they will be checked against original data and carry out interview with farmers if necessary. All the responses to these errors will be documented and compiled.

Junenghuili will calculate emission reductions for each CPA and store the outputs in hard disks as well as hard copy printouts.

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**Appendix 1: Contact information on entity/individual responsible for the PoA**

Organization	Junenghuili Carbon Capital Management (Beijing) Co., Ltd.
Street/P.O. Box	Qianbanbi Street, 64,66#, Xicheng District
Building	Room 202, Building 3
City	Beijing
State/Region	
Postcode	100035
Country	China
Telephone	+86 10-58301285
Fax	+86 10-58302353
E-mail	zqd@cncdm.cn
Website	
Contact person	Zhang Qiuduan
Title	CEO
Salutation	Ms.
Last name	Zhang
Middle name	
First name	Qiuduan
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	zqd@cncdm.cn



Organization	PEAR Carbon Offset Initiative, Ltd
Street/P.O. Box	Tsukiji 1-10-11, Chuo-ku
Building	RATIO 1002
City	Tokyo
State/Region	
Postcode	104-0045
Country	Japan
Telephone	+81-3-3248-0557
Fax	+81-3-3248-0557
E-mail	
Website	www.pear-carbon-offset.org
Contact person	Naoki Matsuo
Title	Dr.
Salutation	Matsuo
Last name	
Middle name	
First name	Naoki
Department	
Mobile	
Direct fax	+81-3-3248-0557
Direct tel.	+81-3-3248-0557
Personal e-mail	n_matsuo@pear-carbon-offset.org



Appendix 2: Affirmation regarding public funding

If any CPA under this PoA avails of public funding, it will be required to provide in its CPA-DD that no official development assistance is diverted to the public funding.



Appendix 3: Application of methodology (ies)

The applicability conditions are demonstrated in section B.2 of this PoA-DD



Appendix 4: Further background information on ex ante calculation of emission reductions

Ex-ante calculation of emission reductions is done separately for each CPA.



Appendix 5: Further background information on the monitoring plan

Please refer to B.7.2 of the PoA-DD.

Appendix 6: Sampling

(a) Sampling Design

(i) Objectives and Reliability Requirements

To check a representative sample of appliances, at least once every two years (biennial) to ensure that micro hydro power plants are still operating or are replaced by an equivalent in service appliance ($R_{O,y}$; Ratio of micro hydro power plants in normal operation in year y). The survey is undertaken once a year with 90/10 confidence/precision as per AMS-I.E. Version 05.

The latest results are used for the calculation of emission reductions

(ii) Target Population

The target population is all micro hydro power plants installed to households in a CPA under this PoA.

(iii) Sampling Method

Sampling of micro hydropower plants/households for the survey is undertaken using a simple random sampling approach. Samples are randomly selected from the list of households under the CPAs.

(iv) Sample Size

The minimum sample is calculated based on the equation given below⁹.

$$n \geq \frac{1.645^2 \times N \times p \times (1 - p)}{(N - 1) \times 0.1^2 \times p^2 + 1.645^2 \times p \times (1 - p)}$$

n	:	Samples
N	:	Total number of micro hydro power plants installed by a CPA
p	:	Expected proportion of micro hydro power plants in normal operation in year y
1.64	:	Represents the 90% confidence required
0.1	:	Represents the 10% relative precision

The minimum sample sizes for the different scenarios required meeting the confidence and precision requirements are calculated in a sample size calculation spreadsheet. The following table shows sample sizes for different population scenarios in a condition of 90% of micro hydro plants are operated well.

⁹ Page 16 “Guidelines for sampling and surveys for CDM project activities and programme of activities” Version 03.0 EB75Annex 8

Table 9: Sample size calculation

Population	Calculated Samples	Adjusted sample size according to response rate of 80%
120	25	32
200	27	34
500	29	37
1,000	30	38
3,000	30	38

(v) Sampling frame

The sampling list is the whole available listing of all user households/micro hydro power plants covered by the CPAs. The associated file is kept in the management system. Computer based random sampling will be conducted.

(b) Data(i) Field Measurement

The parameters to be monitored are:

- Ratio of micro hydro power plants operated normally in a year y.

The frequency is twice a year. The method is conducting detailed interview with the households.

(ii) QA/QC

The interviewer is to check the obtained information from various aspects. If some inconsistencies are found in the interview, the interviewer is trying to clarify such inconsistencies. If the interviewer concluded that the obtained data is not reliable, the household should be outside of the sample group.

As per AMS-I.E. (Version 05), in cases where survey results indicate that 90/10 precision is not achieved, the lower bound of a 90% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 precision.

(iii) Analysis

In addition, the obtained results will be checked against the historical trend. If some specific aspects are found, some analysis would be undertaken and the results will be explained in the monitoring report.

(c) Implementation(i) Implementation Plan

The CME will develop sampling plans for CPAs implementers. The sampling survey will be conducted two times a year and an average value of the surveys will be used. Typically, the survey would be undertaken in January and June, respectively.



History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities" (EB 66, Annex 13).
01	EB33, Annex43 27 July 2007	Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Registration		