



**CLEAN DEVELOPMENT MECHANISM  
FORM FOR SUBMISSION OF BUNDLED SMALL SCALE PROJECT ACTIVITIES  
(SSC-CDM-BUNDLE)**

**SECTION A. General description of the Bundle**

**A.1. Title of the Bundle:**

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Title of the bundle project: Lixian Yikeyin Small Hydropower Project

**A.1.1. Version and Date :**

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SSC-CDM-Bundle Form:

Version: 01

Date of Submission: 17/04/2009

PDD:

Version: 04

Date of Submission: 17/04/2009

**A.2. Description of the Bundle and the subbundles :**

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Lixian Yikeyin Small Hydropower Project (hereafter: the Project), a run-of-river small hydropower project, is located at Putou Village of Li County, Sichuan Province, People's Republic of China. The Project includes two small power plants: Stage 1 and Stage 2. Both of them are located on the Rijiaogou River, which is a branch of Zagunao River. The main parameters for Stage 1 and Stage 2 are as followings:

**Stage 1:** The installed capacity of Stage 1 is 4MW (2MW \* 2), with a rated water head of 167m, rated flux of 1.5 m<sup>3</sup>/s, and operation for 4842h per year, Stage 1 is expected to generate electricity by 19360 MWh per year, and the net power delivered to the grid will be 18300 MWh. The estimated of emission reduction is 17843 tCO<sub>2</sub>e.

**Stage 2:** The installed capacity of Stage 2 is 9.6MW (3.2MW \*3), with a rated water head of 366m, rated flux of 1.15 m<sup>3</sup>/s, and operation for 4502h, Stage 2 is expected to generate electricity by 43220 MWh a year, and the net power exported to the grid will be 40850 MWh. The estimated of emission reduction is 39831 tCO<sub>2</sub>e.

In general, the Project has a total installed capacity of 13.6 MW, the annual electricity generation from the Project is expected to be 62580 MWh, and the net power exported to the grid is 59150 MWh. The electricity will deliver to the Central China Power Grid (CCPG). Then, the estimated annual emission reduction is expected to be 57674 tCO<sub>2</sub>e.



## CDM-SSC-BUNDLE

Project activity	Type	Category	Technology/Measure
Run-of-river small hydropower project	Type I: Renewable energy projects	Renewable electricity generation for a grid	Diversion type hydropower station. Water is diverted through tunnel, pressure regulation house, steel penstock, and then run through the power house to generate renewable power.

**A.3. Project participants:**

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Name of Party involved (*) (host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (the host)	Li County Jiujaiyi Hydropower Development Co. Ltd.	No
Sweden	Carbon Asset Management Sweden AB	No

(\*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

**Host Country:** People's Republic of China. P.R.China approved the Kyoto Protocol to the United Nations Framework Convention on Climate Change on 30 August 2002, and is a Party to the Kyoto Protocol. The Designated National Authority (DNA) of People's Republic of China is the National Development and Reform Commission (NDRC).

**SECTION B. Technical description of the Bundle:**

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**B.1. Location of the Bundle:**

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**B.1.1. Host Party(ies):**

&gt;&gt;

People's Republic of China (Host)

**B.1.2. Region/State/Province etc.:**

&gt;&gt;

Sichuan Province

**B.1.3. City/Town/Community etc:**

&gt;&gt;

Li County, Putou Village, Wuwangan Group

**B.1.4. Details of physical location, including information allowing the unique identification of this Bundle:**

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Lixian Yikeyin Small Hydropower Project includes 2 small power plants: Stage 1 and Stage 2, both of them use water potential in Rijiaogou River to generate electricity. Stage 1 locates on the upriver of Stage 2. The distance is 5 km far from the powerhouse of Stage 2 to Li Township, Sichuan Province, P.R. China.

The geographical coordinate of Stage 1 is:

Longitude: 102°32'46" ~ 102°50'30" E

Latitude: 31°07'54" ~ 31°16'40" N

And the geographical coordinate of the powerhouse of Stage 2 is:

Longitude: 102°52'32" ~ 103°02'12" E

Latitude: 31°16'42" ~ 31°26'10" N

Figure 1 shows the location.



Figure 1 The location of Lixian Yikeyin Small Hydropower Project

**B.2. Type(s), category(ies) and technology/(ies)/Measure/(s) of the bundle:**

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**1. Type and category(ies) of the small-scale project activity**



Type I: Renewable energy projects

Category I.D.: Renewable electricity generation for a grid

## 2. Technology of the small-scale project activity

The Project is a run-of-river hydropower project, including 2 plants: Stage 1 and Stage 2. The tailing water of Stage 1 will be conducted to Stage 2 to generate electricity. Both plants use water potential in Rijiaogou River. The constructions include barrage, tunnel, pressure regulation house, steel penstock, and power house.

According to the Feasibility Study Report of the proposed project, the barrage of each plant is 3.5 m in height, and 3.0 m of it is under ground. It means that only 0.5 m of the barrage is above the ground. The water from the river will drop through a lattice to a well, and then conducted through a tunnel to the powerhouse. Thus, there is not submerged area in the proposed project. The main design features and characteristics of the proposed project were listed in Table 1.

**Table 1 Major technological parameters of the project<sup>1</sup>**

	Stage 1	Stage 2
<b>Turbine</b>		
Type	CJA475-W-120/2*13.5	CJA237-W-130/1×14
Quantity	2	3
Rated water head (m)	167	365
Rated flowing (m <sup>3</sup> /s)	1.46	1.1
<b>Generator</b>		
Type	SFW2000-14/1730	SFW3200-10/1730
Quantity	2	3
Rated installed capacity (MW)	2.0	3.2
Rated voltage (kV)	6.3	6.3
<b>Others</b>		
The length of the tunnel (m)	3092.37	1357.79
The height of the barrage (m)	3.53	3.5
Operation hours (h)	4842	4502

## 3. Measure of the bundle

The proposed project has 2 sub-bundles: Stage 1 and Stage 2. The installed capacity is 4.0 MW for Stage 1 and 9.6 MW for Stage 2. And the project owner confirms that the total installed capacity of both Stage 1 and Stage 2 will not change during the whole crediting period. Thus, the total installed capacity is 13.6 MW during the whole crediting period which is still under the limit for small-scale project.

<sup>1</sup> Data source: the Purchase Agreement for the turbine and generator signed between the project owner and Hunan Linli Hengyuan Electricity Generation Facilities Co. Ltd. on Jul. 30, 2007.

**B.3 Estimated amount of emission reductions over the chosen crediting period:**

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The ex-ante estimated amount of emission reductions over the first crediting period of the bundle project are listed in Table 2 below.

**Table 2 Ex-ante estimation of emission reductions**

Years	Annual estimation of emission reductions in (tCO <sub>2</sub> e)
Jan.2010 -Dec. 2010	57674
Jan.2011 -Dec. 2011	57674
Jan.2012 -Dec. 2012	57674
Jan.2013 -Dec. 2013	57674
Jan.2014 -Dec. 2014	57674
Jan.2015 -Dec. 2015	57674
Jan.2016 -Dec. 2016	57674
Total estimated reductions (tones of CO <sub>2</sub> e)	403718
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tones of CO <sub>2</sub> e)	57674

**SECTION C. Duration of the project activity / Crediting period:****C.1. Duration of the Bundle**

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**C.1.1. Starting date of the Bundle:**

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26/05/2007 (the construction permission issuance date)

**C.1.2. Expected operational lifetime of the project activities:**

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30 years 0 month

**C.2. Choice of crediting period and related information:**

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**C.2.1. Renewable crediting period:**

&gt;&gt;

7 years \*3

**C.2.1.1. Starting date of the first crediting period:**

&gt;&gt;

01/01/2010 (or the registered date whichever is later)

**C.2.1.2. Length of the first crediting period:**

&gt;&gt;



7 years 0 month

**C.2.2. Fixed crediting period:**

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**C.2.2.1. Starting date:**

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Not applicable

**C.2.2.2. Length:**

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Not applicable

**SECTION D. Application of a monitoring methodology:**

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The Monitoring Plan for this project has been developed to ensure that from the start, the project is well organized in terms of the collection and archiving of complete and reliable data.

**1. Monitoring subject**

Given the emission factor is ex-calculated and according to the Methodology AMS.I.D., the only data to be monitored is electricity supplied to the grid by the project (detailed in B.7.1).

**2. Monitoring organization**

Prior to the start of the crediting period, the organization of the monitoring team will be established. Clear roles and responsibilities will be assigned to all staff involved in the CDM project and a single CDM Manager will be nominated. The CDM Manager will have the overall responsibility for the monitoring system on this project.

All other CDM monitoring staff will have clearly defined roles and responsibilities. The CDM Manager will manage the process of training new staff, ensuring trained staff performs the monitoring duties and that where trained monitoring staff is absent; the integrity of the monitoring system is maintained by other trained staff.

A handbook of monitoring will be established prior to the start of the project. These procedures will detail the organization, control and steps required for certain key monitoring system features, including:

- CDM staff training
- CDM data and record keeping arrangements
- Data collection
- CDM data quality control and quality assurance
- Equipment maintenance
- Equipment calibration
- Equipment failure

See Annex 4 for a description and the scope of these procedures.

The CDM Manager will be responsible for ensuring that the procedures are followed on site and for

continuously improving the procedures to ensure a reliable monitoring system is established. All staff involved in the CDM project will receive some relevant training from CDM consultants. Records of trained CDM staff will be retained by the Project owner. The CDM Manager will ensure that only trained staff is involved in the operation of the monitoring system.

### 3. Monitoring equipment and installation

The proposed project includes two units: Stage 1 and Stage 2. The electricity generated by Stage 1 will be connected to Stage 2, and then together with that generated by stage 2 the electricity will be delivered to the grid. The meters' location was shown in Fig.2.

The electricity delivered to the grid by the proposed project activity (Stage 1 and Stage 2) and the power imported from the grid will be automatically monitored by electricity meters. The main meter (M4) will be installed at the connecting point of the proposed project and the power grid. To ensure maximum availability of CDM data and to introduce quality controls of the CDM data, a backup meter (M3) will be installed in addition to the main meter. This back-up meter will be located at the central control room of Stage 2.

Both M4 and M3 are bi-direction electricity meters, and these meters will be installed in accordance with Chinese Sectional Regulations. The accuracy of both meters is no less than 0.5s. Both M4 and M3 are the key meters for CER calculation.

Meter M1 and Meter M2 measure the electricity amount generated from Stage 1 and Stage 2, separately. The data recorded by M1 and M2 will not used for CER calculation.

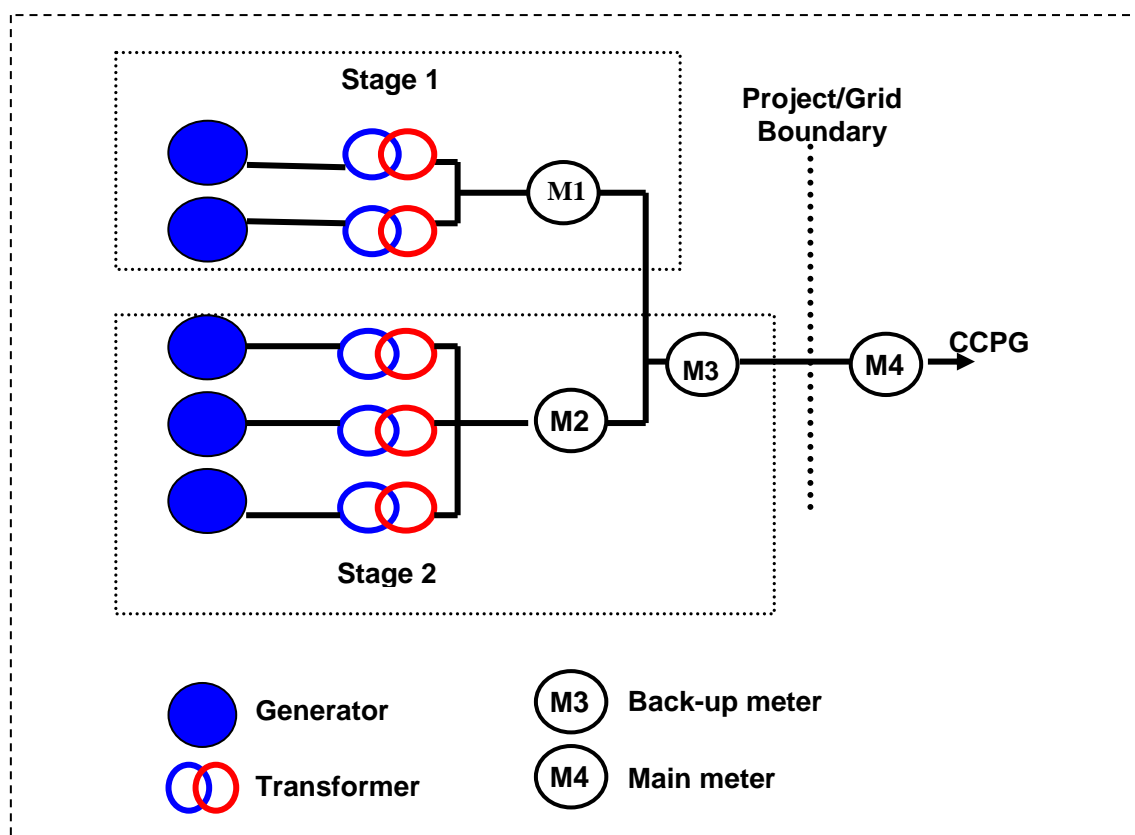


Fig. 2 the sketch map of the meters' location



#### 4. Data monitoring

The readings of the main meter will be used for calculating the emission reductions when the meter is in normal operation state. The monitoring steps are as follows:

- (1) The electricity imported and exported will be continually measured and monthly recorded by the main meter. The difference of exported and imported electricity is the net electricity generation.
- (2) The Power Grid Company provides the project owner with the net electricity generation data;
- (3) The project owner provides the Power Grid Company with sales receipts and preserves the copies of the sales receipts.
- (4) The project owner provides DOE with readings record of meters and copies of sales receipts.

The principle of the processes is to guarantee the DOE could obtain the actual and precise data of net generated electricity.

#### 5. QA/QC

Both the main meter and the back-up meter are bi-directional meter type, which can record both the electricity amount exported to the grid from the Project and the electricity amount imported from the grid to the Project. The readings of the electricity meter will be continually measured and monthly recorded. The recording data will be cross-checked by the electricity sale invoices.

According to national standards, both main meter and backup meter will be calibrated once a year. All calibration and maintenance standards and procedures will follow Chinese industrial codes and regulations. The accuracy of both meters is 0.5s. In case of a reading of the main meter is evidenced to be wrong (or a calibration is not ok), readings from the backup meter will be adopted with transmission loss deducted.

#### 6. Data management

At the end of each month the monitoring data will be filed electronically. The electronic files will have back-up or print-out. The project owner will keep electricity sale and purchase invoices.

All written documentation such as maps, drawings, the EIA and the Preliminary Design Report will be archived and available to the verifier so that the reliability of the information may be checked. In order to make it easy for the verifier to retrieve the documentation and information in relation to the project emission reduction verification, the project owner will provide a document register. The document management system will be developed to ensure adequate document control for CDM purposes.

The dedicated CDM Manager of the project owner is responsible for checking the data and the CDM Manager will be responsible for managing the collection, storage and archive of all data and records. All the data will be kept until two years after the end of the last credit period.

Annex 1**CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

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## CDM-SSC-BUNDLE

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