Project design document form for small-scale CDM project activities

(Version 05.0)

PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	Nam Long Hydropower Project
Version number of the PDD	04
Completion date of the PDD	26/09/2014
Project participant(s)	Nam Long Power Co., Ltd. Climate Bridge Ltd.
Host Party	Lao PDR United Kingdom of Great Britain and Northern Ireland
Sectoral scope and selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral Scope 1: Energy Industries. Baseline methodology: AMS I.D. - Grid Connected Renewable Electricity Generation
Estimated amount of annual average GHG emission reductions	24,035 t CO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Nam Long Hydropower project (hereafter referred to as the “the project”) is located 50 km west of Luang Namtha and 9 km northwest of Long District, Luang Namtha Province, Lao PDR. The project is located on the Nam Long, a tributary of the Nam Ma, which finally discharges into the Mekong River. The scheme is a run-of-river scheme. The installed capacity of the project is 5 MW, with the annually 37 GWh power supplied to the local Luang Namtha grid. Electricite du Laos (EDL) will buy all power produced, with measurement of output at the plant.

The power supply in Luang Namtha Province is precarious, till 2011, there was only one 1.5MW hydropower project in the local Luang Namtha grid, most of the electricity is imported from China. The Luang Namtha province is facing a considerable shortage in supply in relation to demand, and load shedding is a frequent phenomenon. The proposed project will result in CO_2 emission reduction, as it will displace the power generation that otherwise would be based on a mix of fossil fuels. The reduction in carbon dioxide emissions is estimated to be 24,035 tonnes per year.

As a renewable energy project, the project will produce positive environmental and economic benefits and contribute to the local sustainable development in following aspects:

- During the construction period, plenty of job opportunities were provided to local residents, and the workers newly coming to the area are bringing local people lots of employment opportunities that increase the income of the local residents;
- The infrastructure has been greatly improved. The enhancement of the transportation and electricity system brings substantial benefits to local villagers;
- The use of firewood will be reduced because of displacement by electricity, this reduces the damage to the local vegetation;
- Provide clean & cheap electricity in this region, promote the sustainable development in this region and slowing down the increasing trend of GHG emissions

A.2. Location of project activity

A.2.1. Host Party

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Lao PDR

A.2.2. Region/State/Province etc.

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Luang Namtha Province

A.2.3. City/Town/Community etc.

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Long District

A.2.4. Physical/ Geographical location

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The Project site is located at the Nam Long, a tributary of the Nam Ma, which finally discharges into the Mekong River, 50 km west of Luang Namtha and 9 km northwest of Long District, Luang Namtha Province, Lao PDR. The approximate coordinates of the project site is: 20°55′58″N, 100°55′58″E.

Figure A.1 Show the location of the project:

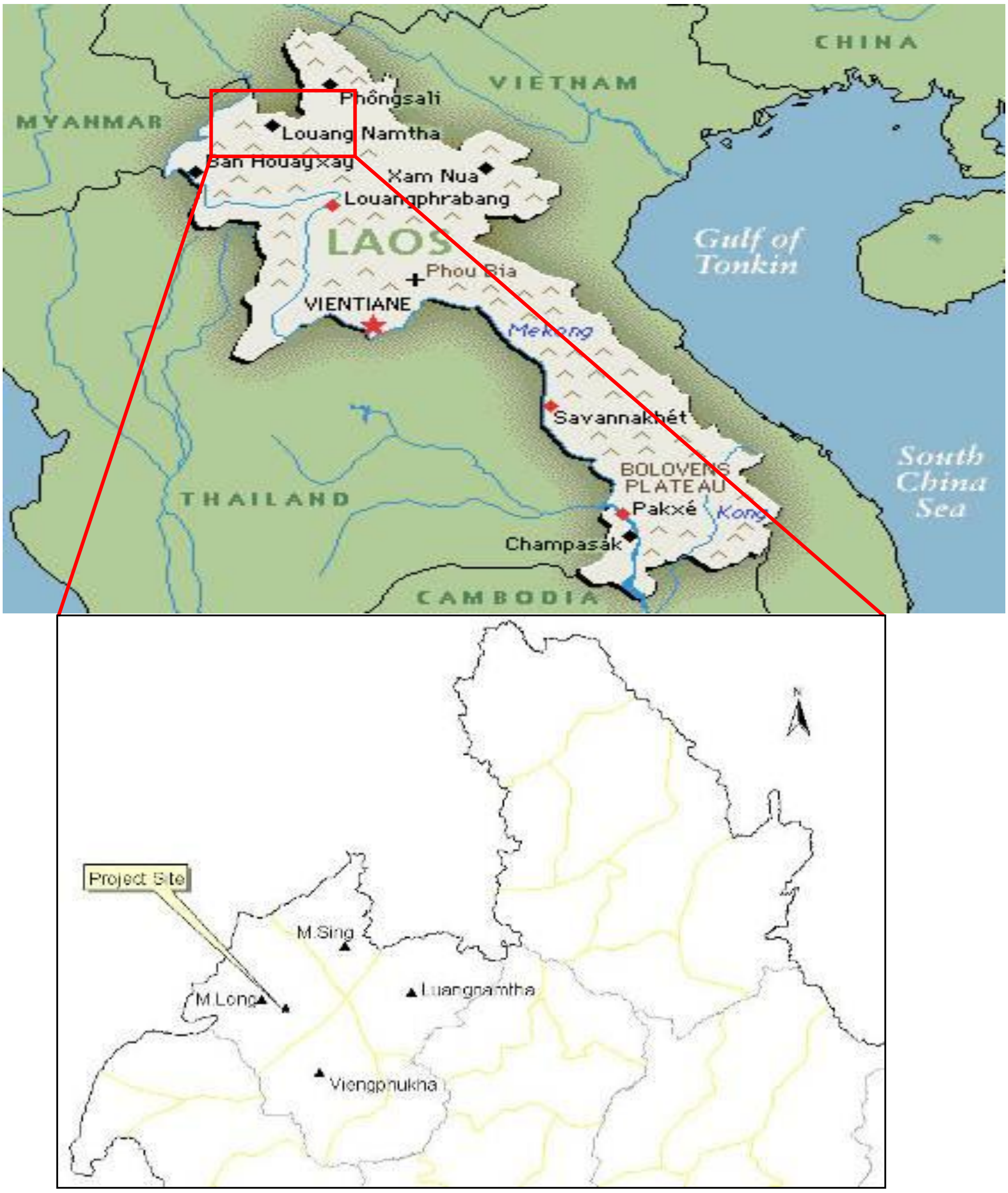

Figure A.1. Location of the project

A.3. Technologies and/or measures

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The total installed capacity of the project is 5 MW. The construction of the project includes fixed weir, a sand f1ush, intake, headrace channel, head tank, penstock, powerhouse with 2 units of turbines (2*2,500 kW), and a tailrace. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity. The baseline scenario is the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. Without the project the existing scenario of imported electricity from China would continue.

The table below summarizes the main technical features of the project.

Table A.1 Main parameters of the project

Parameter	Unit	Value
Gross head	m	254
Rated head	m	245
Rated discharge	m3/s	2.62
Installed capacity	MW	5
Electricity generation	MWh	37,000
Plant factor	-	84%

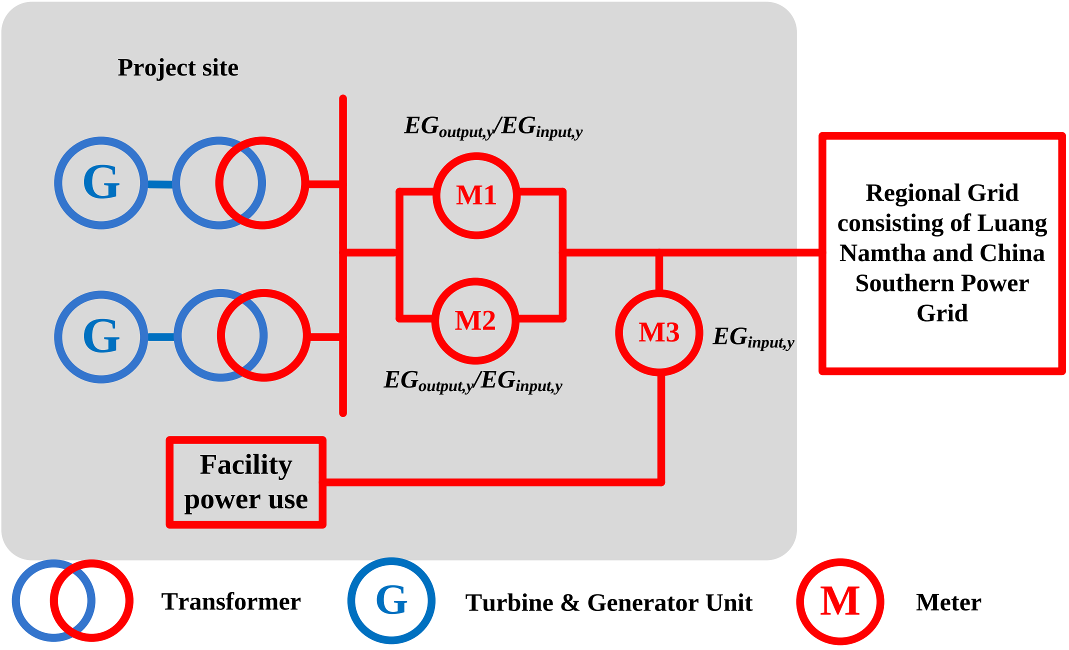

Figure A.2. Technical diagram

A.4. Parties and project participants

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Party involved (host) indicates 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)
Lao PDR (host)	Nam Long Power Co., Ltd. (Project owner)	**No**
United Kingdom of Great Britain and Northern Ireland	Climate Bridge Ltd.	**No**

A.5. Public funding of project activity

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The project does not receive any public funding from Parties included in Annex I of the UNFCCC. The project does not use ODA directly or indirectly.

A.6. Debundling for project activity

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According to the *Guidelines on Assessment of Debundling for SSC Project Activities (Version 03, EB54, Annex 13)*, a proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

(a) With the same project participants;
(b) In the same project category and technology/measure;
(c) Registered within the previous 2 years; And
(d) Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

The project owner indicates that there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity in accordance with any condition mentioned above, therefore the project is not a de-bundled component of a large project activity.

SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

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Baseline methodology:

Baseline methodology:

AMS I.D. Grid connected renewable electricity generation (Version 17, EB 61).

This methodology draws upon the following tools:

Guidelines for demonstrating additionality of microscale project activities (version 05.0, EB 73) and Tool to calculate the emission factor for an electricity system (version 4, EB 75)

And the Approved consolidated baseline and monitoring methodology ACM0002 (Version 14, EB 75): Consolidated baseline methodology for grid-connected electricity generation from renewable sources is also a reference according to AMS I.D.

Please click following link for more information about the methodology and tool:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2. Project activity eligibility

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The Project is a grid connected renewable electricity generation project which meets all the applicability criteria stated in methodology ASM I.D (version 17):

- The project makes use of renewable water resources to generate electricity to the local Luang Namtha grid;
- The project will install a new power plant at the site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant);
- The total installed capacity of the project is 5 MW, it satisfies the requirement that the capacity of the project should be at most 5 MW for a small-scale CDM project.
- The other criteria stated in the AMS I.D are not applicable to the project;

Therefore, the methodology AMS-I.D.-Grid Connected Renewable Electricity Generation is applicable to the Project.

B.3. Project boundary

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Spatial boundary

The project located in the north part of Lao PDR, The power generated by the project will be supplied to the local Luang Namtha Power Grid, which is not connected with the main grid of Lao EDL, but connected with China Southern Power Grid (CSPG) through transmission lines.

According to the AMS-I.D., the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

According to "Tool to calculate the emission factor for an electricity system", the **project electricity system** is defined as the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (i.e. the renewable power plant location) and that can be dispatched without significant transmission constraints.

According to the tool mentioned above, there are no transmission constraints if any one of the following criteria is met:

i. In case of electricity systems with spot markets for electricity: there are differences in electricity prices (without transmission and distribution costs) of less than five per cent between the two electricity systems during 60 per cent or more of the hours of the year; or
ii. The transmission line is operated at 90 per cent or less of its rated capacity at least during 90 per cent of the hours of the year.

For transmission lines between China and Lao Power Grid, there is no spot market exists, so the criteria i. list above is not applicable. Furthermore the load of the transmission lines between local grid and China Southern Power Grid is about 36% of its rated capacity[1]. So, the electricity system does not have significant transmission constrain.

According to the "Tool to calculate the emission factor for an electricity system":

In addition, in cases involving international interconnection (i.e. transmission line is between different countries and the project electricity system covers national grids of interconnected countries) it should be further verified that there are no legal restrictions for international electricity exchange.

As the infrastructure in the North part of Lao PDR is poor, the power use is dependence on the power supplied from China. From Dec 2009 to Mar 2014, there is totally 522 million KWh power supplied from China to Lao[2]. During the Neighboring State Electricity Enterprise Summit, 6 country including Lao and China signed the Memorandum of Understanding on high-level communication mechanism for the transnational Power Grid deep cooperation. Based on the above information, it could be concluded that there are no legal restrictions for international electricity exchange.

Based on the reasons listed above, it is shown that the most appropriate definition of the spatial extension of the **project electricity system** is a regional grid consisting of regional grid of Luang Namtha Grid and CSPG.

According to "Tool to calculate the emission factor for an electricity system", the **Connected electricity system** is an electricity system that is connected by transmission lines to the project electricity system. As the local Luang Namtha Power Grid is not connected with any other power grid, the connected electricity system is defined according to the definition provided by the

[1] According to the statement from local power grid staff, the rated capacity of the 22KV transmission line is 12.75 MW, the normally load is about 4.6 MW, which accounts 36% (4.6/12.75) of its rated capacity.
[2] http://www.csg.cn/nwgsxw/2014/gdyw/201404/t20140429_80028.html

Chinese DNA (NDRC)[3]. As the Central China Power grid (CCPG) supplied power to CSPG in 2009, 2010, 2011[4], therefore, CCPG is selected as the **connected electricity system**.

Geographical site: the area where the project is constructed which includes the dam, the tunnel, the power house and the sub-station.

Physical boundary: This consists of all power plants connected physically to the electricity system, which is defined as the Local Luang Namtha Grid and the China Grid, to which the project is connected (Refer to Section B.4 for details).

Emission sources and gases

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in the table below.

Table B.1. GHG emissions in Project boundary

	Source	Gas	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project Activity	For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non condensable gases contained in geothermal steam.	CO_2	No	Not applicable to hydro power Project
		CH_4	No	
		N_2O	No	
	CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants.	CO_2	No	Not applicable to hydro power Project
		CH_4	No	
		N_2O	No	
	For hydro power plants, emissions of CH_4 from the reservoir.	CO_2	No	Minor emission source
		CH_4	No	The project does not create reservoir, thus the emission source from reservoir is excluded
		N_2O	No	Minor emission source

A flow diagram of the project boundary is presented in Figure B.1 below. The flow diagram physically delineates the project boundary, includes the flow of electricity and the project electricity system and the GHG emissions.

[3] http://cdm.ccchina.gov.cn/Detail.aspx?newsId=41386&TId=3

[4] CCPG supplied power to CSPG: 21,852,270 MWh in 2009, 23,423,940 MWh in 2010 and 16,118,680 in 2011, China DNA.

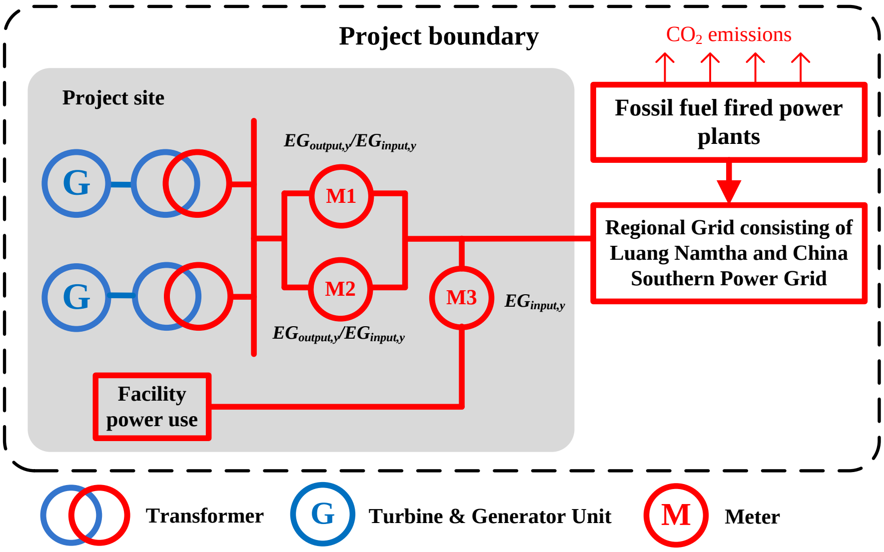

Figure B.1 Flow diagram of the project boundary

B.4. Establishment and description of baseline scenario

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According to ASM I.D, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.

Long District is not connected to the main power grid in Lao PDR. The map below shows that the grid receives power from the China Southern Power Grid. Power is distributed in the province by EdL.

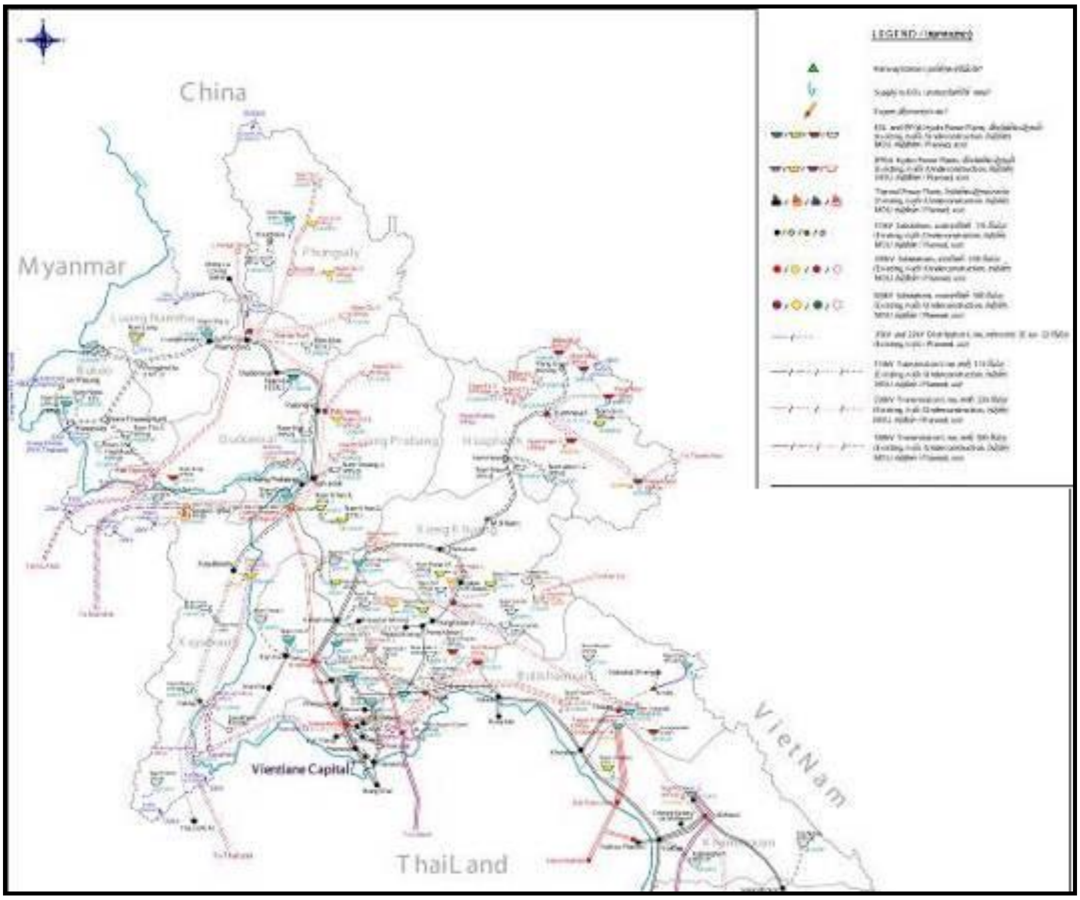

Figure B.2 Planned Power System Diagram of Lao In year of 2015[5]

According to the definition of the China Power Grid provided by the Chinese DNA (NDRC)[6], the China Power Grid consists of six Regional Power Grids which is Northern China Power Grid (NCPG), Northeastern China Power Grid (NECPG), Eastern China Power Grid (ECPG), Central China Power grid (CCPG), Northwestern China Power Grid (NWCPG) and China Southern Power Grid (CSPG). The project is connected physically with the CSPG. CSPG is defined as the project electricity system.

The grid consists of independent province-level electricity systems including Guangdong, Guangxi, Yunnan, Guizhou and Hainan province that are physically connected through transmission and distribution lines. In accordance with the tool, the **project electricity system** is a regional grid consisting of regional grid of Luang Namtha Grid and CSPG, and the CCPG as the **connected electricity system**. The imported electricity and relevant CO_2 emission will be considered in OM calculation.

Thus the baseline scenario of the proposed project is delivery of the equivalent amount of annual power from the local Luang Namtha grid and output from the CSPG, to which the proposed project is also connected. To determine the baseline scenario, the information for the Luang Namtha grid is provided by Electricite du Laos (EDL), and the information for the China Southern Power Grid is provided by Chinese DNA.

B.5. Demonstration of additionality

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Prior CDM consideration:

The Project Owner was aware of CDM incentives following the completion of the Feasibility Study Report (FSR). As the Feasibility Studies had shown that the project would only deliver a marginal revenue for investors, the Project Owner started to obtain quotations from CDM Consultants.

Table B.2. Major milestones in the development of the investment project and CDM application

Detail	Date
FSR Completed	February 2008
FSR approved by government of Lao (GoL)	07/04/2008
Initial Environmental Examination (IEE) Completed	May 2008
Board meeting decided to carry out the project with CDM assistance	05/06/2008
Civil Work Agreement(Start date)	**07/07/2008**
Service Agreement of CDM Development with an local Consultant for finding the a buyer	11/11/2008
Signed PPA	11/02/2009
A Japanese CERs buyer sent a Letter of Interest for the project	17/04/2009
Desk Due Diligence Conducted by the Japanese Buyer	12/09/2009
The Japanese buyer issued refusal letter due to failed DD, for there is no regulation for the trans-nation power grid situation	12/10/2009
IEE approved by GOL	07/12/2009
MOU for CERs purchasing was signed with an European Buyer	03/09/2010
The European Buyer carried out an onsite visit for the project	April 2011
Equipment Purchase Contract	11/05/2011
Successful Due Diligence letter	04/07/2011
Apply for Lao LoA	06/09/2011
Due to Market Falls, the European buyer decided to withdraw from the project	28/03/2012

[5] Date Source: EdL Technical Department Power System Planning Office
[6] http://cdm.ccchina.gov.cn/Detail.aspx?newsId=41386&TId=3

Termination of authorization with the local consultant	10/08/2012
CDM Services Agreement with new consultant Beijing Karbon Energy Consulting Co., Ltd.	12/02/2013
Term sheet with the new buyer Climate Bridge Ltd.	10/04/2013
ERPA signed with Climate Bridge Ltd.	08/10/2013
Updated LoA Application to Lao DNA	25/11/2013

As per the "*Guidelines on the Demonstration and assessment of prior consideration of the CDM*" (Version 04), the project's start date is before 02/08/2008, it does not need to inform the Host Country DNA and the UNFCCC secretariat their intention to seek CDM status.

The additionality of the Project could be assessed according to the UNFCCC-approved additionality demonstration criteria of "Microscale Project Activity" per *Guidelines for demonstrating additionality of microscale project activities* (Version 05.0).

According to Paragraph 8(a), Project activities up to five megawatts that employ renewable energy technology are additional if the geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone (SUZ) of the host country, which can be summarized as follow in accordance with the project situation:

(i) The installed capacity of the project is up to 5 MW
The installed capacity of the project is 5 MW, which is no more than 5 MW.

(ii) The project activity is located in LDCs/SIDs
Lao PDR is one of the 49 least developed countries[7] published by the Committee for Development Policy (CDP).

Therefore, the condition 8(a) is satisfied. Thus, the project is deemed to be additional.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

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The Methodology AMS I.D (version 17) is applied in the context of the project in the following four steps:

- **Step 1, calculate the project emissions;**
- **Step 2, calculate the baseline emissions;**
- **Step 3, calculate the project leakage;**
- **Step 4, calculate the emission reductions.**

Calculate the project emissions

According to Methodology, the project emissions shall be calculated by the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad \text{(Equation B.1)}$$

Where:

PE_y	=	Project emissions in year y (tCO_2e/yr)
$PE_{FF,y}$	=	Project emissions from fossil fuel consumption in year y (tCO_2/yr)
$PE_{GP,y}$	=	Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO_2e/yr)

[7] http://www.unohrlls.org/en/ldc/25/

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

This project does not involve fossil fuel consumption and geothermal power, so $PE_{FF,y}=0$, $PE_{GP,y}=0$. For hydro power project activities that result in new reservoirs and hydro power project activities that result in the increase of existing reservoirs, project proponents shall account for project emissions, estimated as follows:

a) If the power density (*PD*) of power plant is greater than 4 W/m^2 and less than or equal to 10 W/m^2:

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000} \quad \text{(Equation B.2)}$$

Where:

$PE_{HP,y}$ = Project emissions from water reservoirs (tCO_2e/yr)

EF_{Res} = Default emission factor for emissions from reservoirs, and the default value as per EB 23 is 90 kg CO_2e /MWh

TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y* (MWh)

b) If the power density (*PD*) of the power plant is greater than 10 W/ m^2

$$PE_{HP,y}=0 \quad \text{(Equation B.3)}$$

The PD of the project activity is calculated as follows:

$$PD=\frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \quad \text{(Equation B.4)}$$

Where:

PD = Power density of the project activity (W/ m^2)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero

As the project does not include a reservoir, there is no PD for the project.

Calculate the baseline emissions

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y=EG_{BL,y} * EF_{CO2,grid,y} \quad \text{(Equation B.5)}$$

Where:

BE_y = Baseline Emissions in year *y* (tCO_2/yr)

EG_{BLy} = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)

$EF_{CO2,grid,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y*

According to Methodology, if the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{BL,y} = EG_{facility,y} \quad \text{(Equation B.6)}$$

The emission coefficient (measured in tCO_2e/MWh) should be calculated in a transparent and conservative manner according to the procedures prescribed in the "*Tool to calculate the emission factor for an electricity system*" (Version 4).

The data used for calculation are from an official source (where available) and publicly available. The calculation processes are as follows:
STEP 1: Identify the relevant electricity system.
STEP 2: Choose whether to include off-grid power plants in the project electricity system.
STEP 3: Select a method to determine the operating margin (OM).
STEP 4: Calculate the operating margin emission factor according to the selected method.
STEP 5: Calculate the build margin (BM) emission factor;
STEP 6: Calculate the combined margin (CM) emissions factor.

STEP 1: Identify the relevant electricity system

As we discussed in section B.3, the **project electricity system** is defined as a regional grid of Luang Namtha Grid and CSPG.

STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional)

According to "*Tool to calculate the emission factor for an electricity system*" (Version 4), there are two options to calculate the operating margin and build margin emission factor:
Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

Option I is chosen for operating margin and build margin emission factor calculation.

STEP 3: Select a method to determine the operating margin (OM)

According to "*Tool to calculate the emission factor for an electricity system*" (Version 4), there are four methods for calculating the $EF_{grid, OM, y}$:
(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch Data Analysis OM, or
(d) Average OM

Calculating method (b) simple adjusted OM, would require the annual load duration curve of the grid. However, the relevant information is not publicly available and is difficult to obtain. Therefore, the method (b) is not applicable.

The method (c) requires the detailed operation and dispatch data of power plants in the grid. This data is also not publicly available for the China Southern Power Grid. Therefore, the method (c) is not applicable.

The method (d), average OM, is used when low-cost / must run resources constitute more than 50% of total amount of power generation in the grid. This is not the scenario in the China Southern Power Grid and therefore method (d) is not applicable.

The method a), the simple OM is used where low-cost / must run resources constitute less than 50% of the total grid generation in: 1) average of the five most recent years or 2) based on long-term normal for hydroelectricity production.

The percentage of low-cost/must run resources in the grid is 26.90% in 2007, 33.76% in 2008, 32.01% in 2009, 30.34% in 2010 and 31.74% in 2011[8]. The low-cost / must run resources constitute less than 10% of the total grid generation in the recent 5 years and the simple OM (method a) can be used. Thus, method (a) is applicable to calculate $EF_{grid, OM, y}$.

For the project, $EF_{grid, OM, simple, y}$ is calculated using ex ante option: a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period.

STEP 4: Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

According to "*Tool to calculate the emission factor for an electricity system*" (Version 4), there are two options based on different data for calculating simple OM:

Option A: Based on the net electricity generation and a CO2 emission factor of each power unit; or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

For the project, the necessary data for Option A is not available, so Option B can be used since the quantity of electricity supplied to the grid by low-cost/must-run power sources is known and off-grid power plants are not included in the calculation..

Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMSimple,y} = \frac{\sum_i (FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y})}{EG_y} \quad \text{(Equation B.7)}$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO2 emission factor in year *y* (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type *i* consumed in the project electricity system in year *y* (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ / mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)

[8] China Electric Power Yearbook 2008~2012 and Lao EdL Annual Report 2008~2011

i	=	All fossil fuel types combusted in power sources in project electricity system in year *y*
y	=	The data available in the most recent 3 years

The Operating Margin emission factors for 2009, 2010 and 2011 are calculated. A 3-year generation-weighted average of the emission factors is calculated as the operating margin emission factor of the baseline, which is calculated ex-ante and will not be renewed in the first crediting period.

CSPG $EF_{grid,OM,y}$, adopts the calculation process updated by China DNA on Sep. 17th 2013. The exact calculation process of CSPG $EF_{grid,OM,y}$ can be found from:
http://www.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/201309181742.pdf

For the detailed calculating procedures please refer to Appendix 4 of the PDD.

The Operation Margin Emission Factor of CSPG and Luang Namtha Grid is **0.9223 tCO_2e/MWh**.

Step 5. Calculate the build margin (BM) emission factor

In terms of vintage of data, project participants can choose between one of the following two options:

Option 1: For the first crediting period, calculate the build margin emission factor *ex-ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex-ante, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The ***Option 1*** is chosen to calculate without requirement to monitor and recalculate the emissions factor during the crediting period.

According to "*Tool to calculate the emission factor for an electricity system*", the sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-units}}$, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%}$, in MWh);

(c) From SET5-units and SET≥20% select the set of power units that comprises the larger annual electricity generation (SET_{sample});

The build margin emissions (BM) factor is the generation-weighted average emission factor (tCO_2e/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follow:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad \text{(Equation B.8)}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year *y* (tCO_2e/MWh);
$EG_{m,y}$	=	Net electricity generated and delivered to the grid by power unit *m* in year *y* (MWh);
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in the year *y* (tCO_2e/MWh);
m	=	Power units included in the build margin;
y	=	Most recent historical year for which power generation data is available;

In China, EB accepts[9] the following deviation in methodology application:

1. The group of power plants to be considered for the determination the BM emission factor can't be selected as no plant specific generation data are available. Instead, the capacity addition from one year to another is used as basis for determining the build margin, i.e. the capacity addition over 1 - 3 years, whichever results in a capacity addition that is closest to 20% of total installed capacity.
2. Use proportional weights that correlate to the distribution of installed capacity in place during the selected period above, using plant efficiencies and emission factors of commercially available best practice technology in terms of efficiency. It is suggested to use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy.

Since there is no way to separate the different generation technology capacities as coal, oil or gas etc from thermal power based on the present statistical data, the following calculating measures will be taken:

- Firstly, according to the energy statistical data of most recent one year, determine the ratio of CO_2 emissions produced by solid, liquid, and gas fuels consumption for power generation;
- Secondly, multiply this ratio by the respective emission factors based on commercially available best practice technology in terms of efficiency;
- Finally, this emission factor for thermal power is multiplied with the ratio of thermal power identified within the approximation for the latest 20% installed capacity addition to the grid. The result is the BM emission factor of the grid.

Sub-step a. Calculate the power generation emissions for solid, liquid and gas fuel and each share of total emissions based on the *Energy Balance Table* of the most recent year.

$$\lambda_{Coal,y} = \frac{\sum_{i \in COAL, j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}} \qquad \text{(Equation B.9a)}$$

---

[9] This is in accordance with the "Request for guidance: Application of AM0005 and AMS-I.D in China", a letter from DNV to the Executive Board, dated 07/10/2005, available online at: http://cdm.unfccc.int/UserManagement/FileStorage/6POIAMGYOEDOTKW25TA20EHEKPR4DM
This approach has been applied by several registered CDM projects using methodology ACM0002 so far.

$$\lambda_{Oil,y} = \frac{\sum_{i \in OIL, j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}$$ (Equation B.9b)

$$\lambda_{Gas,y} = \frac{\sum_{i \in GAS, j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}$$ (Equation B.9c)

Where,

$F_{i, j, y}$	=	The amount of fuel *i* (in a mass or volume unit) consumed by power plant/unit *j* in year(s) *y*;
$NCV_{i,y}$	=	The net calorific value (energy content) of fossil fuel type *i* (coal, oil and gas) in year *y* (GJ/Mass or Volume unit);
$EF_{CO2,i, j, y}$	=	The CO_2 emission factor of fuel type *i* (coal, oil and gas) in year(s) *y* (tCO_2e/GJ);
Coal, Oil and Gas	=	Solid fuel, liquid fuel and gas fuel respectively;

Sub-step b. Calculate emission factor for thermal power of the grid based on the result of Step a. and the efficiency level of the best technology commercially available in China.

$$EF_{Thermal,y} = \lambda_{Coal,y} \times EF_{Coal,Adv,y} + \lambda_{Oil,y} \times EF_{Oil,Adv,y} + \lambda_{Gas,y} \times EF_{Gas,Adv,y}$$ (Equation B.10)

Where $EF_{Coal, Adv,y}$, $EF_{Oil, Adv,y}$ and $EF_{Gas, Adv,y}$ refer to the emission factors of efficiency level of the best technology commercially utilized in power generation using coal, oil and gas in China.

Sub-step c. Calculate BM of the grid based on the result of Step b and the share of thermal power of recent 20% capacity additions.

$$EF_{BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \cdot EF_{Thermal}$$ (Equation B.11)

Where,

CAP_{Total}	=	Total capacity additions(MW);
$CAP_{Thermal}$	=	Capacity additions of thermal power(MW);

As mentioned above, the build margin emission factor of the baseline is calculated ex-ante and will not be renewed in the first crediting period.

CSPG $EF_{grid, BM, y}$ adopts the data updated by China DNA on Sep. 17th, 2013. The exact calculation process of $EF_{grid, BM, y}$ can be found at:
http://www.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/20130917081706402591.pdf

Refer to Appendix 4 of the PDD for more details.

The Build Margin Emission Factor of CSPG & Luang Namtha Grid is **0.3769 tCO_2e/MWh**.

STEP 6: Calculate the combined margin (CM) emissions factor

According to "*Tool to calculate the emission factor for an electricity system*" (Version 4), the calculation of the combined margin (CM) emission factor ($EF_{grid, CM, y}$) is based on one of the following methods:

(a) Weighted average CM; or
(b) Simplified CM.

The weighted average CM method (option A) should be used as the preferred option, and therefore adopted in this project.

$$EF_{CO2,grid,y} = EF_{grid,CM,y} = w_{OM} \times EF_{grid,OM,y} + w_{BM} \times EF_{grid,BM,y} \qquad \text{(Equation B.12)}$$

Where:

w_{OM} = Weighting of operating margin emission factor (%);
w_{BM} = Weighting of build margin emission factor (%).

The Operating Margin Emission Factor (***$EF_{grid,CM,y}$***) is 0.9223 tCO_2e/MWh and the Build Margin Emission Factor (***$EF_{grid,CM,y}$***) is 0.3769 tCO_2e/MWh. The defaults weights value for other than wind and solar power generation projects are used as specified in the "*Tool to calculate the emission factor for an electricity system*" (Version 04) (w_{OM} = 0.5*;* w_{BM} = 0.5).

Using values mentioned above, the Combined Margin Emission Factor of CSPG& Loung Namtha Grid (***$EF_{grid,CM,y}$***) corresponds to **0.6496** tCO_2e/MWh.

Calculate the project leakage

No leakage emissions are considered.

Calculate the emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \qquad \text{(Equation B.13)}$$

Where:

ER_y = Emission reduction in year *y* (t CO_2e/yr)
BE_y = Baseline emission in year *y* (t CO_2e/yr)
PE_y = Project emission in year *y* (t CO_2e/yr)

B.6.2. Data and parameters fixed ex ante

>>

Data / Parameter	***$FC_{i,y}$, $F_{i,j,y}$***
Unit	mass or volume unit of the fuel *i*
Description	Amount of fossil fuel type *i* consumed in the project electricity system in year *y* (mass or volume unit)
Source of data	China Electric Power Yearbook 2010~2012 EdL Annual Report 2008~2011
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	Data used are from China and Lao DNA.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	***$NCV_{i,y}$***
Unit	kJ/kg or kJ/m^3
Description	The net calorific value (energy content) per mass or volume unit of fuel *i* in year *y.*

Source of data	China Electric Power Yearbook 2010~2012 EdL Annual Report 2008~2011
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	Data used are from China and Lao DNA.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	$EF_{CO2, i,y}$, $EF_{CO2, i,j,y}$
Unit	tCO_2/TJ
Description	The CO_2 emission factor per unit of fuel *i* in year *y*, or the CO_2 emission factor per unit of fuel *i* by province *j* in year *y*
Source of data	*2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Chapter 1 Table 1.4*
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	No specific local value available, the value form IPCC 2006, Guidelines for National Greenhouse Gas Inventories was adopted.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	EG_y ,$EG_{m,y}$
Unit	MWh
Description	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y.*
Source of data	China Electric Power Yearbook 2010~2012 EdL Annual Report 2008~2011
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	Data used are from China and Lao DNA.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	$EG_{import,y}$
Unit	MWh
Description	The electricity(MWh) imported from CCPG in year *y*.
Source of data	China Electric Power Yearbook 2010~2012
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	Data used are from China DNA.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	***A_{BL}***
Unit	m^2
Description	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full
Source of data	Project on-site
Value(s) applied	0
Choice of data or Measurement methods and procedures	For new reservoirs, this value is zero.
Purpose of data	Project emission
Additional comment	

Data / Parameter	***CAP_{BL}***
Unit	MW
Description	Installed capacity of the hydro power plant before the implementation of the project activity.
Source of data	Project on-site
Value(s) applied	0
Choice of data or Measurement methods and procedures	For new hydro power plants, this value is zero
Purpose of data	Project emission
Additional comment	

Data / Parameter	***EF_{Res}***
Unit	$kgCO_2e/MWh$
Description	Default emission factor for emissions from reservoirs
Source of data	*Methodology ACM0002 (Version 14)*
Value(s) applied	90 $kgCO_2e/MWh$
Choice of data or Measurement methods and procedures	-
Purpose of data	Project emission
Additional comment	

Data / Parameter	***$FC_{BM,i,y}$***
Unit	mass or volume unit
Description	Amount of fossil fuel type *i* consumed by the most recently built power plants in year *y*
Source of data	China Electric Power Yearbook 2010~2012 EdL Annual Report 2008~2011
Value(s) applied	See Appendix 4 for details.
Choice of data or Measurement methods and procedures	Data used are from China and Lao DNA.
Purpose of data	Baseline emission
Additional comment	

B.6.3. Ex ante calculation of emission reductions

>>

Project emission

PE_y=0 tCO_2e

Baseline emission

According to section B.6.1, in first crediting period, the baseline emission factor of the project:

$EF_{CO2,grid,y} = EF_{grid,CM,y} = w_{OM} \times EF_{grid,OM,y} + w_{BM} \times EF_{grid,BM,y}$ =0.6496 tCO_2e/MWh.

The baseline emission of the project:

$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$ = 37,000 ×0.6496=24,035 tCO_2e

Project leakage

No leakage emissions are considered.

Emission reductions

$ER_y = BE_y - PE_y$ =24,035 – 0 = 24,035 tCO_2e

B.6.4. Summary of ex ante estimates of emission reductions

>>

Year	Baseline emissions (tCO_2 e)	Project emissions (tCO_2 e)	Leakage (tCO_2 e)	Emission reductions (tCO_2 e)
Year 1	24,035	0	0	24,035
Year 2	24,035	0	0	24,035
Year 3	24,035	0	0	24,035
Year 4	24,035	0	0	24,035
Year 5	24,035	0	0	24,035
Year 6	24,035	0	0	24,035
Year 7	24,035	0	0	24,035
Total	168,245	0	0	168,245
Total number of crediting years	7			
Annual average over the crediting period	24,035	0	0	24,035

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

>>

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Calculated value
Value(s) applied	$EG_{facility,y} = EG_{output,y} - EG_{input,y}$
Measurement methods and procedures	Calculated
Monitoring frequency	
QA/QC procedures	Please refer to $EG_{output,y}$ and $EG_{input,y}$
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	$EG_{output,y}$
Unit	MWh
Description	Electricity supplied by the project to the grid in year *y*
Source of data	Measured by meters.
Value(s) applied	37,000
Measurement methods and procedures	Continuous measurement and monthly recording
Monitoring frequency	Monthly
QA/QC procedures	According to the recommendation by the manufacturer or the regulations of the grid company, meters will be calibrated periodically. Data measured by meters will be cross-checked with the record document confirmed by EdL.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	$EG_{input,y}$
Unit	MWh
Description	The electricity used by the project and input from the grid in year *y*
Source of data	Measured by meters.
Value(s) applied	Estimated to be 0 MWh for ex-ante calculation
Measurement methods and procedures	Continuous measurement and monthly recording
Monitoring frequency	Monthly
QA/QC procedures	According to the recommendation by the manufacturer or the regulations by the grid company, meters will be calibrated periodically. Data measured by meters will be cross-checked with the record document confirmed by EdL.
Purpose of data	Baseline emission
Additional comment	

Data / Parameter	Cap_{PJ}
Unit	MW
Description	Installed capacity of the hydro power plant after the implementation of the project activity.
Source of data	FSR

Value(s) applied	5
Measurement methods and procedures	Use the data in the FSR at start of the project. Measure by check the nameplate after operation.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Project emission
Additional comment	-

B.7.2. Sampling plan

>>

The purpose of the monitoring plan is to ensure that the monitoring and calculation of emission reductions of the project within the crediting period is complete, consistent, clear and accurate. The plan will be implemented by the project owner with the support of the grid corporation.

1. Monitoring organization

The monitoring process will be carried out under the responsibility of the project owner. A monitoring panel will be established by the plant managers to be in charge of monitoring the data and information relating to the calculation of emission reductions with the cooperation of the Technical and Financial Department. A CDM manager will be assigned full charge the monitoring works. The operation and management structure is shown below:

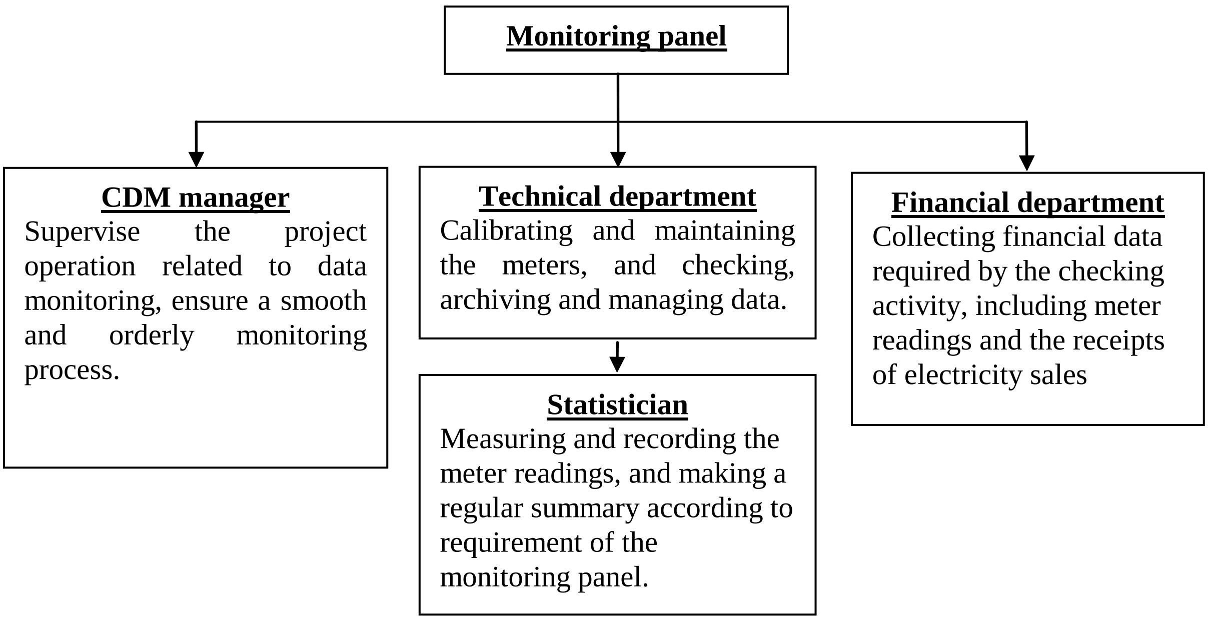

Figure B.3 Organization structure of the monitoring activity

2. Monitoring apparatus and installation:

The meters will be installed in accordance with relevant national or international standard. Before the operation of the project, the metering equipments will be clarified and examined by the project owner and the power grid company according to the above regulation.

The M1 and M2 are bidirectional meters. Meter M1 will be the main meter, installed at the grid access points, to monitoring both the input and output electricity. Meter M2 will be the backup meter for M1. The accuracy of M1 and M2 is 0.5s. Meter M3 will be installed also for monitoring the power download for the facility power use. The accuracy of M3 is 1. Therefore, the reading from M1 upload will be recorded for the $EG_{output,y}$, and the sum up of M1 and M3 download will be recorded for $EG_{input,y}$.

The power generated will be delivered to the local power grid through a 22kV transmission line.

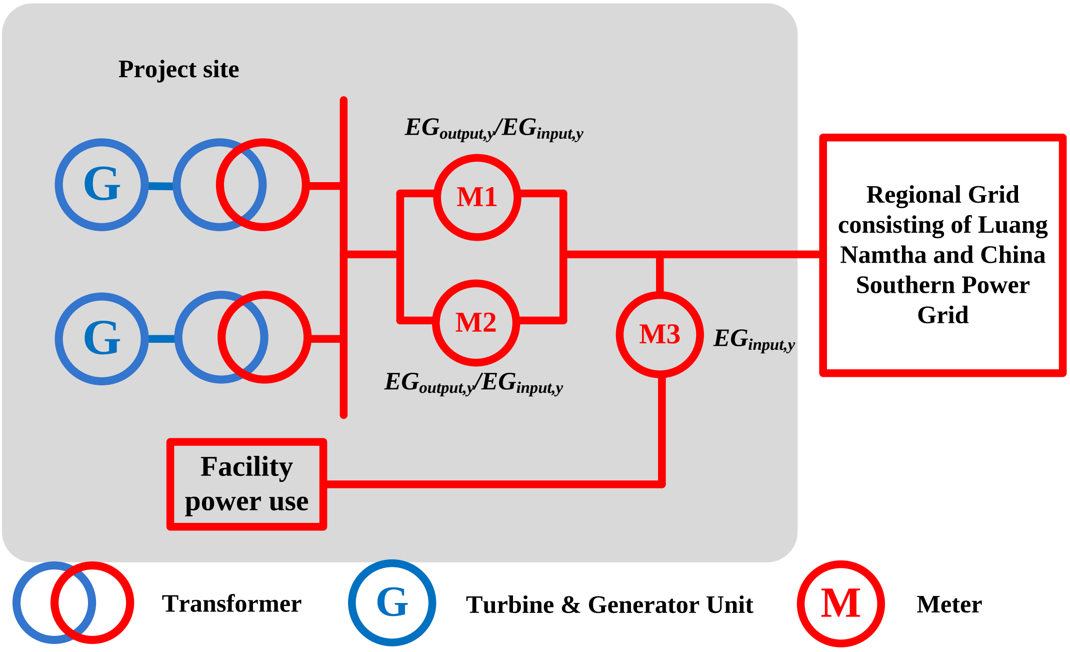

Figure B.4 Monitoring points of the project

3. Data collection:

The specific steps for data collection and reporting are listed below:

a) During the crediting period, both the grid company and the project owner will record the values displayed by the main meter.
b) Simultaneously to step a), the project owner will record the values displayed by the backup meters.
c) The meters will be calibrated according to the relevant regulation and request of EdL.
d) The main meter's readings will be cross-checked with the record document confirmed by EdL.
e) The project owner and the grid company will record both output and input power readings from the main meter. These data will be used to calculate the amount of net electricity delivered to the grid.
f) The project owner will be responsible of providing copies of the record document confirmed by EdL to the DOE for verification.

If the reading of the main meter in a certain month is inaccurate and beyond the allowed error or the meter doesn't work normally, the grid-connected power generation shall be determined by following measures:

g) Read the data of the backup meters.
h) If the backup meter's data is not accurate enough to be accepted, or the practice is not standardized, the project owner and the grid corporation should jointly make a reasonable and conservative estimation method which can be supported by sufficient evidence and proved to be reasonable and conservative when verified by the DOE.
i) If the project owner and the grid corporation don't agree on an estimated method, arbitration will be conducted according the procedures set by the agreement to work out an estimation method.

4. Calibration

Calibration of Meters & Metering should be implemented according to relevant standards and rules accepted by the grid company EdL. After the examination, the meters should be sealed. The lift of the seals requires the presence of both the project owner and the grid company. One party must not lift the seals or fiddle with the meters without the presence of the other party.

All the meters installed shall be tested by a qualified metering verification institution commissioned jointly by the project owner and the grid company within 10 days after:

1) Detection of a difference larger than the allowed error in the readings of both meters;
2) The repair of all or parts of the meter caused by the failure of one or more parts that do not operate in accordance with the specifications.

5. Data management system

Physical documents such as the plant electrical wiring diagram will be gathered with this monitoring plan in a single place. In order to facilitate auditors' access to project documents, the project materials and monitoring results will be indexed. All paper-based information will be stored by the technical department of the project owner and all the material will have a copy for backup. All data, including calibration records, will be kept until 2 years after the end of the total crediting period.

6. Monitoring Report

During the crediting period, at the end of each year, the monitoring officer shall produce a monitoring report covering the past monitoring period. The report shall be transmitted to the general manager who will check the data and issue a final monitoring report in the name of the project participants. Once the final report is issued, it will be submitted to the DOE for verification.

B.7.3. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

>>
Date of completion of application of methodology and standardized baseline:
26/09/2014

Responsible persons/ entities:
Mr. Lu Yaodong
Beijing Karbon Energy Consulting Co., Ltd.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

>>
07/07/2008 (signature of the civil work agreement)

C.1.2. Expected operational lifetime of project activity

>>
25 years

C.2. Crediting period of project activity

C.2.1. Type of crediting period

>>

First period of renewable crediting period

C.2.2. Start date of crediting period

>>
20/07/2014

C.2.3. Length of crediting period

>>
7 years of the first crediting period

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>
The Initial Environmental Examination with Environmental Management Plan (IEE) for the project was compiled by the qualified institute “National Consulting Group (NCG)”. The IEE has approved by the Water Resources and Environment Administration in 07/12/2009. According to this report, environmental impacts caused by the project and the corresponding measures adopted by the project owner for mitigation are as following:

Construction Phase

Wastewater

The waste water is not allowed to be discharged into the river directly in order to protect the water quality. The wastewater generated from disturbed, erosion prone land (i.e. construction camps, quarries, borrow pits and spoil dumps) will be treated employing the following mitigation measures according to the IEE:

- Dirty water from erosion-prone land will be collected in interception channels and, if necessary, directed to sedimentation ponds, prior to being released to the environment;
- Septic sanitation facilities will be provided to construction and camp areas. No untreated human waste is allowed to enter any watercourse to affect water quality, aquatic environments and human health.
- All hydrocarbons (e.g. fuels and lubricants) and chemical reagents will be stored in safe places, fully bundled areas constructed and managed in accordance with relevant International Standards and Material Safety Data Sheets. Oil, fuel and lubricant storage areas should be located apart from any water courses. The project developer will ensure that containers of reagents and drums of used oil or grease are stored under cover at all times;
- Potentially oil runoff from areas such as vehicle maintenance bays, equipment lay down areas, or refuelling stations will be contained by perimeter bundling or interception drains. Oil runoff will be directed through oil/water separators prior to discharge to the environment. Oil/water separators will be regularly cleaned and maintained.

Exhaust gases and dust

Exhaust gases resulting from vehicles, construction equipments and the dust generating from the construction activities is the greatest threat of air quality. Dustproof measures are employed including watering and dust collecting, wet construction method will be used to minimize the negative impact and those construction equipment and vehicles in compliance with relevant sanitary regulations will be selected and properly conserved. Furthermore, dustproof respirator will be applied to protect the respiratory tract of the workers on site who are granted to be the main casualties. Attribute to the methods mentioned above, the negative impact on air quality is confined into the construction site during the construction period and can be neglected.

Solid and Liquid Waste

Waste management procedures will be based on the following hierarchy (in decreasing order of preference): (i) Minimize the waste production and maximize waste recycling and reuse; and (ii) Promote safe waste disposal.

To minimize waste production, a lot of mitigation measures will be taken including maximizing the efficiency of all on-site activities, supplying products with less waste produced and using no-hazardous materials. Project owner will educate staff, contractors to minimize litter generation and procedures will be established for segregating different types of waste at the location where they are generated to maximize the recovery of recyclables.

Noise and vibration

The area of construction, including quarries should have restricted working hours, including restricted times for above ground blasting. Construction workers exposed to noise levels of 70-80 dB or more than will be provided with adequate hearing protection, in accordance with the requirements of the health and safety plan. The exhaust and radiator silencers will be fitted to construction equipment, in particular, trucks and loaders. Construction activities and use of heavy vehicles will be minimized during night time. Emissions from reversing alarms may be regulated to reduce intrusiveness, particularly at night.

Impacts on ecosystem

Soil and water erosion might be induced attribute to slope exploration, earth-and-rock excavation, and the utilization of dumpsites. Rehabilitation of vegetation and other technique methods will be conducted to minimize the negative impact once the construction activities completed.

Lands will be occupied permanently due to the construction of a water retaining dam, an access road, dumpsites and livelihood areas, however, due to the severe vegetation deterioration, the soil is poor with low coverage rate of vegetation. Therefore, the induced ecosystem loss is minimal.

No cultural relic, mineral or protected plant were identified during the environment survey, and no extinction of plants will be induced. Hence, the impact to the local ecosystem attributed to the transformation of land use is insignificant.

As the construction site is far away from any village, the proposed project will not result in any displacement of residents and inundation of houses.

Operation Phase

Waste water

The wastewater mainly generated from the permanent staff during the operation phase is not allowed to be fed into the river directly. It is designed that the domestic sewage should be disposed using the advanced integrated treatment equipment to minimize the impacts on local environment.

Water quality and quantity

Due to to the run-of-river type of the hydropower project, the hydrological features such as the precipitation, temperature etc. will not alter. Furthermore, the minimum water flow will be not less than the natural flow in the dry season to maintain the eco-system.

In conclusion, environmental impacts arising from the project are considered insignificant.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>
Stakeholder comments are collected in a series of ground survey, village profile and household survey with the use of questionnaires and interviews.

The participants of the surveys and interviews were from different groups including: all the stakeholders who have concerns about the project, representatives of the Lao Women's Union at village level, Lao national Old People Union at the village level, and the head of village and the head of household.

In order to consult the public's opinions and suggestions about the project, stakeholders were invited to carry out a consultation meeting through local government and bulletins. The stakeholder meeting was hold in 19/03/2008, 35 stakeholders including representative of government officials at the Long district, Lao Women's Union, Lao national front for Construction Youth Union at the village level and representatives of local villagers. The summary of stakeholders is as follow:

Table E.1. Basic information of the comments participants

Item	Category	Number	Percentage
Age	Below 30	8	22.8%
	30~40	12	34.3%
	40~50	12	34.3%
	Above 50	3	8.6%
Gender	Male	23	65.7%
	Female	12	34.3%
Education	Elementary school	16	45.7%
	Junior high school	8	22.9%
	Senior high school	9	25.7%
	College and above	2	5.7%

E.2. Summary of comments received

>>
The comments received from the stakeholders are summary as follows:

1) minimum water flow
2) improve local power supply situation
3) improve the road construction
4) provide working chance to local residents

E.3. Report on consideration of comments received

>>
The project does not involve resettlements. Considerations on the comments by the stakeholders are listed as follow:

1) The minimum flow will be always released to maintain the eco-system and meet demand for irrigation in the downstream.
2) The construction of the project will improve the local electricity transmission system and promote the electrification progress.
3) During the project construction period, the project owner will improve local road conditions to transport the equipments, which will greatly improve local transportation condition.

4) During the project construction period, plenty of working chances will be provided to local residents. And during the operation period, some long-term positions will be provided to local people.

SECTION F. Approval and authorization

>>

The Letter of approval from the Lao PDR was issued in 26/03/2014, and the Letter of approval from UK was issued in 01/07/2014.

- - - - -

Appendix 1: Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization	Nam Long Power Co., Ltd.
Street/P.O. Box	Asean Street, House No. 192, Sidamduane Village, Chanthabouly District
Building	
City	Vientiane Capital
State/Region	
Postcode	
Country	Lao PDR
Telephone	856-21-213-138
Fax	856-21-213-407
E-mail	bounleuthlcc@yahoo.com
Website	www.lcclao.com
Contact person	Bounleuth LUANGPASEUTH
Title	
Salutation	Mr.
Last name	LUANGPASEUTH
Middle name	
First name	Bounleuth
Department	
Mobile	856-20-5551 5194
Direct fax	856-21-213-407
Direct tel.	856-21-213-138
Personal e-mail	bounleuthlcc@yahoo.com

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization	Climate Bridge Ltd.
Street/P.O. Box	Bluebell Road, Alvington
Building	Motivo House
City	Yeovil
State/Region	Somerset
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Appendix 2: Affirmation regarding public funding

No public funding from parties included in UNFCCC Annex I is available to the project activity.

Appendix 3: Applicability of selected methodology and standardlized baseline

Please refer to the Section B.1 of the PDD.

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

Table 1 2009 OM

Fuel	Unit	Guangdong	Guangxi	Guizhou	Yunnan	Hainan	Luang Namtha	Total of Fuel ($FC_{i,y}$)	Emission Factor ($kgCO_2/TJ$)	Average NCV ($MJ/t,km^3$)	CO_2 emission(tCO_2e)
		A	B	C	D	E	F	G=A+…+F	H	I	$J=I\times H\times E/10^5$ (in mass) $L=I\times H\times E/10^4$(in volume)
Raw coal	10^4 t	8,011.98	1,815.41	4,925.23	3,311.44	376.59		**18,440.65**	87,300	20,908	**336,591,357**
Cleaned coal	10^4 t	1.8						**1.8**	87,300	26,344	**41,397**
Other washed coal	10^4 t			11.67	44.92			**56.59**	87,300	8,363	**413,158**
Briquette	10^4 t	195.86						**195.86**	87,300	20,908	**3,574,971**
Coke	10^4 t	4.9	1.6		1.63			**8.13**	95,700	28,435	**221,236**
Coke oven gas	10^8 m^3		2.89	2.02	2.48			**7.39**	37,300	16,726	**461,047**
Other coal gas	10^8 m^3	1.11	20.88		48.61			**70.6**	37,300	5,227	**1,376,468**
Crude oil	10^4 t							**0**	71,100	41,816	**0**
Gasoline	10^4 t							**0**	67,500	43,070	**0**
Diesel	10^4 t	6.46	0.52		0.49	0.12		**7.59**	72,600	42,652	**235,027**
Fuel oil	10^4 t	157.37	0.09					**157.46**	75,500	41,816	**4,971,182**
LPG	10^4 t							**0**	61,600	50,179	**0**
Refinery gas	10^4 t	0.51						**0.51**	48,200	46,055	**11,321**
Natural gas	10^8 m^3	47.21				6.19		**53.4**	54,300	38,931	**11,288,511**
Other petroleum products	10^4 t	45.31				0.83		**46.14**	72,200	41,816	**1,393,020**
Other coke products	10^4 t							**0**	95,700	28,435	**0**
Other energy	10^4 t-tce	152.99	98.56	23.01	49.01	20		**343.57**	0	0	**0**
Total											***360,578,694***

Data source: ***China Energy Statistical Yearbook 2010; EdL Annual Report 2009***

Note:
The electricity import from CCPG in 2009 is 21,852,270 MWh, and the simple OM emission factor of CCPG in 2009 is 0.95455tCO_2e/MWh, so the total CO_2 emission of CSPG &Luang Namtha Grid in 2009 is 360,578,694 + 0.95455 ×21,852,270 = 381,437,884 tCO_2e.

Table 2 2009 Coal Firing Power Generation				
Province	**Electricity Generation**	**Electricity Generation**	**Plant own consumption**	**Power Supplying to Grid**
	(10^8 kWh)	**(MWh)**	**(%)**	**(MWh)**
Guangdong	2,143	214,300,000	6.16	201,099,120
Guangxi	428	42,800,000	6.69	39,936,680
Guizhou	978	97,800,000	6.68	91,266,960
Yunnan	548	54,800,000	6.52	51,227,040
Hainan	114	11,400,000	8.17	10,468,620
Luang Namtha	0	0		0
Total				393,998,420

Data source: ***China Electric Power Yearbook 2010, EdL Annual Report 2009***

Note:
When calculating simple OM emission factor in 2009, the electricity import from CCPG is 21,852,270MWh, so the total thermal power generation of CSPG in 2009 is 393,998,420 +21,852,270 = 415,850,690 MWh.

Table 3 2010 OM											
Fuel	**Unit**	**Guangdong**	**Guangxi**	**Guizhou**	**Yunnan**	**Hainan**	**Luang Namtha**	**Total of Fuel ($FC_{i,y}$)**	**Emission Factor ($kgCO_2/TJ$)**	**Average NCV ($MJ/t,km^3$)**	**CO_2 emission(tCO_2e)**
		A	**B**	**C**	**D**	**E**	**F**	**G=A+…+F**	**H**	**I**	**J=I×H×E/10^5 (in mass) L=I×H×E/10^4(in volume)**
Raw coal	10^4 t	9,758.45	2,330.59	4,876.8	3,345.11	471.84		**20,782.79**	87,300	20,908	**379,341,699**
Cleaned coal	10^4 t	1.03	0.39					**1.42**	87,300	26,344	**32,658**
Other washed coal	10^4 t			11.24	39.08			**50.32**	87,300	8,363	**367,381**
Briquette	10^4 t	179.27						**179.27**	87,300	20,908	**3,272,159**
Coke	10^4 t							**0**	95,700	28,435	**0**
Gangue	10^4 t	301.69		26.13	62.95			**390.77**	87,300	8,363	**2,852,972**
Coke oven gas	10^8 m^3		2.82	2.02	3.25			**8.09**	37,300	16,726	**504,719**
Blast furnace gas	10^8 m^3	0.79	42.32	9.32	48.03			**100.46**	219,000	3763	**8,278,878**
BOF gas	10^8 m^3	0.33	4.25		1.8			**6.38**	145,000	7945	**734,992**
Gasoline	10^4 t							**0**	67,500	43,070	**0**
Diesel	10^4 t	4.65	0.41	2.29	0.76	0.08		**8.19**	72,600	42,652	**253,606**
Fuel oil	10^4 t	83.39	0.1					**83.49**	75,500	41,816	**2,635,869**
Petroleum coke	10^4 t	20.4						**20.4**	82,900	31947	**540,275**
LPG	10^4 t	164.94						**164.94**	61,600	51,434	**4,606,554**
Refinery gas	10^4 t	0.56						**0.56**	48,200	46,055	**12,431**
Natural gas	10^8 m^3	34.04				7.62		**41.66**	54,300	38,931	**8,806,729**
Other petroleum products	10^4 t	0.63				0.47		**1.1**	72,200	41,816	**33,210**
Other coke products	10^4 t								95,700	28,435	**0**
Other energy	10^4 t-tce	163.95	77.36		26.02	23.47		**290.8**	0	0	**0**
Total											***412,274,132***

Data source: ***China Energy Statistical Yearbook 2011, EdL Annual Report 2010***

Note:

The electricity import from CCPG in 2010 is 23,423,940 MWh, and the simple OM emission factor of CCPG in 2010 is 0.9923tCO_2e/MWh, so the total CO_2 emission of CSPG &Loung Namtha in 2010 is 412,274,132 + 0.9923 ×23,423,940 = 435,517,738 tCO_2e.

Table 4 2010 Coal Firing Power Generation

Province	Electricity Generation	Electricity Generation	Plant own consumption	Power Supplying to Grid
	(10^8 kWh)	(MWh)	(%)	(MWh)
Guangdong	2,535	253,500,000	5.97	238,366,050
Guangxi	557	55,700,000	6.55	52,051,650
Guizhou	956	95,600,000	6.85	89,051,400
Yunnan	546	54,600,000	6.93	50,816,220
Hainan	139	13,900,000	7.57	12,847,770
Luang Namtha	0	0		0
Total				443,133,090

Data source: ***China Electric Power Yearbook 2011, EdL Annual Report 2010***

Note:

When calculating simple OM emission factor of CSPG&Luang Namtha in 2010, the electricity import from CCPG is 23,423,940MWh, so the total thermal power generation in 2010 is 443,133,090 +23,423,940 = 466,557,030 MWh.

Table 5 2011 OM												
Fuel	**Unit**	**Guangdong**	**Guangxi**	**Guizhou**	**Yunnan**	**Hainan**	**Luang Namtha**	**Total of Fuel ($FC_{i,y}$)**	**Emission Factor ($kgCO_2/TJ$)**	**Average NCV ($MJ/t,km^3$)**	**CO_2 emission(tCO_2e)**
		A	**B**	**C**	**D**	**E**	**F**	**G=A+…+F**	**H**	**I**	**J=I×H×E/10^5 (in mass) L=I×H×E/10^4(in volume)**
Raw coal	10^4 t	11,799.44	2,807.29	4,266.00	3,520.42	607.41		**23,000.56**	87,300	20,908	**419,821,954**
Cleaned coal	10^4 t							**0**	87,300	26,344	**0**
Other washed coal	10^4 t			1,291.29	22.96			**1,314.25**	87,300	8,363	**9,595,207**
Briquette	10^4 t	182.83						**182.83**	87,300	20,908	**3,337,138**
Coke	10^4 t							**0**	95,700	28,435	**0**
Gangue	10^4 t	320.15		71.26	36.78			**428.19**	87,300	8,363	**3,126,172**
Coke oven gas	10^8 m^3		3.05	1.88	2.66			**7.59**	37,300	16,726	**473,525**
Blast furnace gas	10^8 m^3	1.58	44.78	9.16	50.65			**106.17**	219,000	3763	**8,749,438**
BOF gas	10^8 m^3	0.33	2.71		2.38			**5.42**	145,000	7945	**624,398**
Gasoline	10^4 t								67,500	43,070	**0**
Diesel	10^4 t	2.80	0.58	3.58	1.05	0.03		**8.04**	72,600	42,652	**248,961**
Fuel oil	10^4 t	24.44	0.07					**24.51**	75,500	41,816	**773,807**
Petroleum coke	10^4 t	16.51			1.38			**17.89**	82,900	31,947	**473,800**
LPG	10^4 t	195.10						**195.10**	61,600	51,434	**5,448,882**
Refinery gas	10^4 t	0.91						**0.91**	48,200	46,055	**20,201**
Natural gas	10^8 m^3	38.19		0.76		6.83		**45.78**	54,300	38,931	**9,677,678**
Other petroleum products	10^4 t	0.53						**0.53**	72,200	41,816	**16,001**
Other coke products	10^4 t							**0**	95,700	28,435	**0**
Other energy	10^4 t-tce	34.53	159.22		25.20			**218.95**	0	0	**0**
Total											***462,387,161***

Data source: ***China Energy Statistical Yearbook 2012, EdL Annual Report 2011***

Note:
The electricity import from CCPG in 2011 is 16,118,680 MWh, and the simple OM emission factor of CCPG in 2010 is 0.98268tCO_2e/MWh, so the total CO_2 emission in 2010 is 462,387,161 + 0.98268 × 16,118,680 = 478,226,638 tCO_2e.

Table 6 2011 Coal Firing Power Generation				
Province	**Electricity Generation**	**Electricity Generation**	**Plant own consumption**	**Power Supplying to Grid**
	(10^8 kWh)	**(MWh)**	**(%)**	**(MWh)**
Guangdong	3046	304,600,000	5.6	287,542,400
Guangxi	637	63,700,000	6.6	59,495,800
Guizhou	1022	102,200,000	7.3	94,739,400
Yunnan	536	53,600,000	7.7	49,472,800
Hainan	158	15,800,000	7.8	14,567,600
Luang Namtha	0	0		0
Total				505,818,000

Data source: ***China Electric Power Yearbook 2012, EdL Annual Report 2011***

Note:
When calculating simple OM emission factor in 2011, the electricity import from CCPG is 16,118,680 MWh, so the total thermal power generation in 2010 is 505,818,000 +16,118,680 = 521,936,680 MWh.

Table A7 Weighted Emission Factor			
Year		**Power Supplying(MWh) (EG_y)**	**Total Emission(tCO_2e)**
		A	**B**
1	2009	415,850,690	381,437,884
2	2010	466,557,030	435,517,738
3	2011	521,936,680	478,226,638
Weighted OM (tCO_2/MWh)=(B1+B2+B3)/(A1+A2+A3)			**0.9223**

Table 8 2011 Calculation of λ_s for the calculation of the BM

Fuel	Unit	Guangdong	Guangxi	Guizhou	Yunnan	Hainan	Loung Namtha	Total of Fuel	Caloric Value	CO_2 emission factor	Oxidation Rate	CO_2 emission
									(MJ/t,km^3)	(kgCO_2/TJ)	(%)	(tCO_2e)
		A	B	C	D	E	F	G=A+…+F	H	I	J	K=G×H×I×J/10^7(in mass) K=G×H×I×J /10^6 (in volume)
Raw coal	10^4 t	11,799.44	2,807.29	4,266.00	3,520.42	607.41		23000.56	20,908	87,300	100	419,821,954
Other washed coal	10^4 t			1,291.29	22.96			1314.25	8,363	87,300	100	9,595,207
Briquette	10^4 t	182.83						182.83	20,908	87,300	100	3,337,138
Gangue	10^4 t	320.15		71.26	36.78			428.19	8,363	87,300	100	3,126,172
Coal, total												***435,880,470***
Diesel	10^4 t	2.80	0.58	3.58	1.05	0.03		8.04	42,652	72,600	100	248,961
Fuel oil	10^4 t	24.44	0.07					24.51	41,816	75,500	100	773,807
Petroleum coke	10^4 t	16.51			1.38			17.89	82,900	31,947	100	473,800
Other petroleum products	10^4 t	0.53						0.53	41,816	72,200	100	16,001
Oil, total												***1,512,570***
Natural gas	10^7 m^3	381.90		7.60		68.30		457.80	54,300	38,931	100	9,677,678
Coke oven gas	10^7 m^3		30.50	18.80	26.60			75.90	37,300	16,726	100	473,525
Blast furnace gas	10^7 m^3	15.80	447.80	91.60	506.50			1061.70	219,000	3,763	100	8,749,438
BOF gas	10^7 m^3	3.30	271.00		23.80			298.10	145,000	7,945	100	3,434,187
LFG	10^4 t	195.10						195.10	54,300	51,434	100	5,448,882
Refinery gas	10^4 t	0.91						0.91	48,200	46,055	100	20,201
Gas, total												***27,803,910***
Total												***465,196,950***

Data source: ***China Energy Statistical Yearbook 2012, EdL Annual Report 2011***

Table A9 Best Practice Commercialized Technology Emission Factors						
	Variable	Efficiency of advanced thermal power plant additions	Fuel Emission Factor	Oxidation Factor	Emission Factor	CO_2 Emission amount of 2011 comparing to the total emission
		(%)	($kgCO_2/TJ$)	(%)	(tCO_2/MWh)	(%)
		A	B	C	D=B*C*3.6/A /10[6]	λ
Coal Firing power plants	$EF_{Coal, Adv}$	39.84%	87,300	100	0.7889	93.70%
Gas Firing Power Plants	$EF_{Gas, Adv}$	52.50%	75,500	100	0.5177	0.33%
Oil Firing Power Plants	$EF_{Oil, Adv}$	52.50%	54,300	100	0.3723	5.98%
Thermal Emission Factor (tCO_2/MWh)	$EF_{Thermal} = \sum_i (D_i \times \lambda_i)$				**0.76317**	

Table A10-1 Installed Capacity 2011								
Installed Capacity	**Unit**	**Guangdong**	**Guangxi**	**Yunnan**	**Guizhou**	**Hainan**	**Luang Namtha**	**Total**
Thermal	MW	56,350	11,770	11,360	20,300	3,150		**102,930**
Hydro	MW	13,020	15,260	28,420	18,660	810	**1.5**	**76,171.5**
Nuclear	MW	6,120						**6,120**
Wind Power and Others	MW	748	50	690	40	275		**1,803**
Total	**MW**	**76,238**	**27,080**	**40,470**	**39,000**	**4,235**	**1.5**	**187,024.5**

Data source: China Electric Power Yearbook 2012, *EdL Annual Report 2011*

Table A10-2 Installed Capacity 2010								
Installed Capacity	**Unit**	**Guangdong**	**Guangxi**	**Yunnan**	**Guizhou**	**Hainan**	**Luang Namtha**	**Total**
Thermal	MW	52,870	10,390	11,330	17,530	2,970		**95,090**
Hydro	MW	12,600	14,940	24,350	16,550	750		**69,190**
Nuclear	MW	5,030						**5,030**
Wind Power and	MW	620		360		210		**1,190**

Others								
Total	**MW**	**71,120**	**25,330**	**36,040**	**34,080**	**3,930**		**170,500**

Data source: ***China Electric Power Yearbook 2011, EdL Annual Report 2010***

Table A10-3 Installed Capacity 2009

Installed Capacity	Unit	Guangdong	Guangxi	Yunnan	Guizhou	Hainan	Luang Namtha	Total
Thermal	MW	48,300	10,770	10,710	17,310	3,090		**90,180**
Hydro	MW	11,260	14,750	20,900	13,610	700		**61,220**
Nuclear	MW	3,950						**3,950**
Wind Power and Others	MW	560		80		60		**700**
Total	**MW**	**64,070**	**25,520**	**31,690**	**30,920**	**3,850**		**156,050**

Data source: China Electric Power Yearbook 2010*, EdL Annual Report 2009*

Table A10-4 Installed Capacity 2008

Installed Capacity	Unit	Guangdong	Guangxi	Yunnan	Guizhou	Hainan	Luang Namtha	Total
Thermal	MW	45,730	10,270	10,030	17,170	2,370		**85,570**
Hydro	MW	10,280	13,970	15,740	9,470	410		**49,870**
Nuclear	MW	3,780						**3,780**
Wind Power and Others	MW	290		80		10		**380**
Total	**MW**	**60,080**	**24,240**	**25,850**	**26,640**	**2,790**		**139,600**

Data source: ***China Electric Power Yearbook 2009, EdL Annual Report 2008***

Table A11 The Calculation of BM Emission Factor								
	Installed Capacity in 2008	**Installed Capacity in 2009**	**Installed Capacity in 2010**	**Installed Capacity in 2011**	**2008～2011 Incremental Capacity Installation[10]**	**2009～2011 Incremental Capacity Installation[7]**	**2010～2011 Incremental Capacity Installation[7]**	**New Installed Capacity Percentages in the total Capacity Increment**
	A	**B**	**C**	**D**	**E**	**F**	**G**	
Thermal(MW)	85,570	90,180	95,090	102,930	26,984	19,184	8,154	49.38%
Hydro(MW)	49,870	61,220	69,190	76,171.5	23,901.5	12,551.5	6,681.5	43.74%
Nuclear(MW)	3,780	3,950	5,030	6,120	2,340	2,170	1,090	4.28%
Wind Power and Others(MW)	380	700	1,190	1,803	1,423	1,103	613	2.60%
Total(MW)	139,600	156,050	156,050	187,023	54,647	35,007	16,537	100.00%
Installed capacity comparing to 2011 capacity					29.22%	18.72%	8.84%	

$$EF_{BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal} = 49.38\% \times 0.76317 = 0.3769\ (tCO_2/MWh)$$

According to "*Tool to calculate the emission factor for an electricity system*" (Version 04), the default weight of all the projects other than wind and solar power generation projects is (W_{OM} = 0.5; W_{BM} = 0.5):

Table A12 Weighted Combined Margin Emission Factor	
Weighted OM (tCO_2/MWh)	0.9223
Weighted BM (tCO_2/MWh)	0.3769
Weighted CM (tCO_2/MWh)	0.6496

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[10] The value is calculated in considering the capacity of the incremental and shut down power stations.

Appendix 5: Further background information on monitoring plan

Please refer to the Section B.7 of the PDD.

Appendix 6: Summary of post registration changes

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Document information

Version	Date	Description
05.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the project design document form for small-scale CDM project activities (these instructions supersede the "Guidelines for completing the project design document form for small-scale CDM project activities" (Version 01.1)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and 错误!未找到引用源。; • Change the reference number from *F-CDM-SSC-PDD* to *CDM-PDD-SSC-FORM*; • Editorial improvement.
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	13 March 2012	EB 66, Annex 9 Revision required to ensure consistency with the “Guidelines for completing the project design document form for small-scale CDM project activities”
03.0	15 December 2006	EB 28, Annex 34 • The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02.0	08 July 2005	EB 20, Annex 14 • The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
01.0	21 January 2003	EB 07, Annex 05 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project design document, SSC project activities