CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC-PoA-DD. At the time of requesting registration the SSC-PoA-DD must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC-CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

Chongqing Fufeng Cement 9MW Waste Heat Recovery for Power Generation Project

Version of document: 1.0

Date of document: 5/3/2010

A.2. Description of the small-scale CPA:

Chongqing Fufeng Cement 9MW Waste Heat Recovery for Power Generation Project (hereafter referred as the proposed CPA) developed by Fufeng Cement Company (hereafter referred as Fufeng Company), one of the biggest private enterprise among the companies of cement industry in Chongqing, which was established in August 1997 and is a main part of the Chongqing Fufeng Cement Group Co., Ltd..

The proposed CPA will install waste heat recovery system and 9MW electricity generation system with a new 4,500 tonnes/day rotary kiln cement product line. Waste heat recovery system will collect the low temperature waste heat of the exit gases from Suspension Pre-heater (SP) and Air Quenching Chamber (AQC) in cement kiln with SP boiler and AQC boiler, and the steam from SP boiler and AQC boiler will go into to a 9MW steam turbine generator for power generation. And all the generated power will be used into the self-production of cement to decrease the power supply purchased from Central China Power Grid (CCPG). Therefore, the electricity generated from the proposed CPA will effectively alternate part of electricity from the fossil fuel power plants of CCPG, which will reduce the GHG emission.

The proposed CPA plans to generate 64,800 MWh of electricity annually and replace for 61,236 MWh of electricity from CCPG, so it can reduce 52,225 tCO_2e of GHG emission per year.

In Chongqing City, more than 35% of heat out of total heat consumed in the clinker calcinations process in cement plants is commonly discharged as waste heat to the surroundings without utilization and this makes a great deal of energy waste and heat pollution. In the proposed CPA, the waste heat shall be totally discharged if the waste heat power generation plant with new 4,500 tonnes/day rotary kiln cement product line is not constructed.

Contribution to the sustainable development:

The proposed CPA accords with China's Energy Industry Development Policies. While using the waste heat power generation, it will contribute to local sustainable development from the following aspects:

- The propose CPA is helpful for supporting the circular economy concept of the National Development and Reform Commission of China, reducing energy consumption and achieving comprehensive utilization of energy during the course of cement production. Therefore, reduce production cost and achieve sustainable development, increase social and economic benefits.
- Electric power generated by the proposed CPA can replace a part of the electricity generated by coal-fired units, through which reduce the local environmental pollution which caused by coal firing.
- The proposed CPAs can reduce emissions of waste heat and heat pollution of the environment, and reduce the dust content of waste gas by recovering a part of materials from the head and rear of kiln, in favor of the local environmental protection.
- The local electricity supply is not enough, so electricity generated by the proposed CPA will not only further reduce the energy consumption of cement production process, but also can further reduce the pressure on the local power supply and promote local economic development.

- The proposed CPA is helpful for increasing the local employment opportunity, some rural labor can work here during the construction and operation phase of the plant. The proposed CPA will offer 17 long-term jobs after the proposed CPA enters into operation.

A.3. Entity/individual responsible for the small-scale CPA:

Here the information on the entity/individual responsible of the CPA shall be included, hence forth referred to as CPA implementer(s). CPA implementers can be project participants of the PoA, under which the CPA is submitted, provided their name is included in the registered PoA.

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 (host)	Chongqing Fufeng Cement Group Co., Ltd.	No
Japan	Tepia Corporation Japan Co., Ltd.*	No

*Tepia Corporation Japan Co., Ltd. is a company whose headquarter is located in Japan. TEPIA has been developing CDM projects in China since 2005 and contributes actively to GHG emission reduction through improving industrial energy efficiency and developing renewable energy.

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

A.4.1.1. Host Party:

People's Republic of China

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

Geographic reference or other means of identification[3], Name/contact details of the entity/individual responsible for the CPA, e.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

The proposed CPA is located in Xinzhai village, Sanhui town, Hechuan district, Chongqing city. The geographical coordinate of the proposed CPA site are: 106°17’ E, 29°058’ N. Figure.1. gives the specific location of the proposed CPA.

[3] E.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

Chongqing City in China

Hechuan district of Chongqing City

Project Site

Figure.1. The location of the proposed CPA

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

01/04/2010 (start date for the proposed CPA construction)

A.4.2.2. Expected operational lifetime of the small-scale CPA:

20 years.

A.4.3. Choice of the crediting period and related information:

Fixed crediting period

A.4.3.1. Starting date of the crediting period:

01/11/2010, or the data of registration, whichever is later

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

Please note that the duration of crediting period of any CPA shall be limited to the end date of the PoA regardless of when the CPA was added.

10 years

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

The proposed CPA will generate an ex-ante estimated 52,225 tCO_2e annual, and fixed crediting period is applicable to the proposed CPA. The estimated amount of emission reductions during the period (from 1/11/2010 to 31/10/2020) is provided below.

Years	Annual estimation of emission reductions in tonnes of CO_2e
2010	8,704
2011	52,225
2012	52,225
2013	52,225
2014	52,225
2015	52,225
2016	52,225
2017	52,225
2018	52,225
2019	52,225
2020	43,521
Total estimated reductions (tonnes of CO_2e)	52,2250
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	52,225

A.4.5. Public funding of the CPA:

There is no public funding from Annex I Parties for the proposed CPA

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

1. *For the purposes of registration of a Programme of Activities (PoA)[4] a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity[5], which:*

[4] Only those PoAs need to be considered in determining de-bundling that are: (i) in the same geographical area; and (ii) use the same methodology; as the POA to which proposed CPA is being added.

(a) *Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same sectoral scope, and;*

(b) *The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.*

2. *If a proposed small-scale CPA of a PoA is deemed to be a debundled component in accordance with paragraph 2 above, but the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM and small-scale A/R project activities as set out in Annex II of the decision 4/CMP.1 and 5/CMP.1 respectively, the CPA of a PoA can qualify to use simplified modalities and procedures for small-scale CDM and small-scale A/R CDM project activities.*

According to Appendix C of the simplified modalities and procedures for small-scale CDM project activities, the proposed CPA is neither a part of any larger scale project or program nor a de-bundled component of a larger project activity, since the proposed CPA participants further confirm that they have not registered any small-scale CDM activities or applied to register another small CDM project activity within 1km of the proposed CPA boundary, neither in the same project category and technology/measure, nor registered within the previous two years.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

According to information provided by UNFCCC and the CPA implementers of this CPA, this CPA is not registered as CPA under other PoA or as an individual CDM.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

Chongqing Waste Heat Recovery and Utilization Programme in Cement Industry

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA:

The proposed PoA is applicable to install cement waste heat recovery systems in Chongqing, China. The SSC-CPA which can be included in the proposed PoA should have the following characteristics:

1. *The SSC-CPA to be included in the proposed PoA should meet the applicability requirements of the methodology AMS-III.Q., and*

The proposed CPA is applicable for the requirements of the methodology AMS-III.Q..

2. *The SSC-CPA should employ same technology, namely install waste heat recovery system and install steam turbine generator system, and*

Te proposed CPA will install a waste heat recovery system and install steam turbine generator system.

3. *The SSC-CPA should generate only electricity, not generate heat, mechanical energy, or other*

[5] Which may be a (i) registered small-scale CPA of a PoA, (ii) an application to register another small-scale CPA of a PoA or (iii) another registered CDM project activity.

production, and

Te proposed CPA will generate only electricity, not generate heat, mechanical energy, or other production.

4. *The capacity of the installed generator in the SSC-CPA should be less than or equal to 15MW, and*

The capacity of the installed generator in the proposed CPA is 9MW, less than 15MW

5. *The generated electricity in the SSC-CPA should be consumed in self-factory for cement production, alternate the regional Central China Power Grid (CCPG) which is dominated by fossil fuel, and*

The generated electricity in the proposed CPA will be consumed in the cement production process of the Fufeng Company, alternate the regional Central China Power Grid (CCPG) which is dominated by fossil fuel.

6. *The coordinating/managing entity of the SSC-CPA to be included in the proposed PoA should be Chongqing Clean Development Mechanism Technical Service Center, and*

The coordinating/managing entity of the proposed CPA is Chongqing Clean Development Mechanism Technical Service Center.

7. *There are no mandatory requirements issued by Chinese government to implement the proposed PoA when the SSC-CPA is included in the proposed PoA, and*

There are no mandatory requirements issued by Chinese and Chongqing municipal government to implement the proposed PoA when the proposed CPA is included in the proposed PoA

8. *The SSC-CPA is implemented in Chongqing City and the physical/geographical boundary of the SSC-CPA does not exceed the physical/geographical boundary of the proposed PoA, and*

The proposed CPA is implemented in Chongqing City

9. *Emission reductions of the SSC-CPA limited in less than or equal to 60 kt CO_2 equivalent annually.*

Emission reductions of the proposed CPA is 52,225 CO_2 equivalent annually, less than or equal to 60 kt CO_2 equivalent annually.

As a result, the proposed CPA can be included in the to-be-registered PoA.

B.3. Assessment and demonstration of additionality of the small-scale CPA, as per eligibility criteria listed in the Registered PoA:

The additionality of the each CPA of the proposed PoA is demonstrated based on the requirement of Appendix A to the *Simplified Modalities and Procedures for Small-scale CDM Project Activities.*

An investment analysis shall be performed below to demonstrate that the proposed CPA faces an investment barrier.

Investment Analysis

Apply benchmark analysis

According to the "*Construction Project Economic Evaluation Methods and Parameters*" (3rd edition) issued by the National Development and Reform Commission and the Ministry of Construction in December 2006, the proposed CPA can be considered commercially viable only when the proposed CPA 's internal rate of return is higher than the benchmark internal rate of return and the pre-tax benchmark is

11% for cement industry. The proposed CPA cement production line energy-saving project, the generating capacity will be fully used by Fufeng Company itself.

Calculation and comparison of financial indicators

The main parameters used to perform the proposed CPA's investment analysis in the proposed CPA feasibility study are as follows:

parameter	unit	value
Installed capacity	MW	9
Running hours	Hour/year	7200
Power generation	MWh/year	64,800
Self consumption rate	%	5.5
Net electricity replace the grid power	MWh/year	61,236
Static total investment	1,000 Yuan RMB	90,00
Current capital	1,000 Yuan RMB	2,000
Average price of electricity from grid (Historic date)	Yuan RMB/kWh	0.44
Annual operation and maintenance cost	1,000 Yuan RMB/year	11,941
Value added tax rate	%	11
Urban maintenance and construction tax rate	%	7
Education tax rate	%	3
Income tax rate	%	25
Credit owned by the Government of China	%	2
Expected CERs price	€/tCO2e	8.50
Exchange rate	RMB/€	10.00
Estimated annual emission reductions	tCO_2e /year	52,225
Project Life Cycle	year	0.5+20
Crediting period Length	year	10

The different calculation results of internal rate of return with and without considering the revenue of CERs are as follows:

Project	Unit	Without CERs revenue	With CERs revenue
IRR	%	9.04	12.60
benchmark	%	11	

As shown in the above table, it indicates that the project IRR without considering the revenue of CERs is only 9.04%, which is lower than the cement industrial benchmark yield. Therefore, the proposed CPA activity does not have the financial attractiveness or commercially viable. Taking the CERs revenue into account, the project IRR is increased to 12.60%, which is higher than the benchmark and the financial attraction will be dramatically improved.

Sensitivity analysis

Three impact factors are considered in the following sensitivity analysis:

1) Total investment
2) Operation and Maintenance Cost

3) Delivered electricity
4) Tariff of electricity

According to "Guidance on the Assessment of Investment Analysis", assuming the above three factors vary in the range of -10%-+10%, the IRR of the proposed project (without CERs revenue) varies in the different extent, as shown in the following:

	-10%	-5%	0%	+5%	+10%
Total investment	10.39%	9.69%	9.04%	8.44%	7.89%
O&M cost	10.31%	9.68%	9.04%	8.39%	7.73%
Power generation	7.75%	8.40%	9.04%	9.67%	10.29%
Electricity tariff	6.39%	7.74%	9.04%	10.30%	11.53%

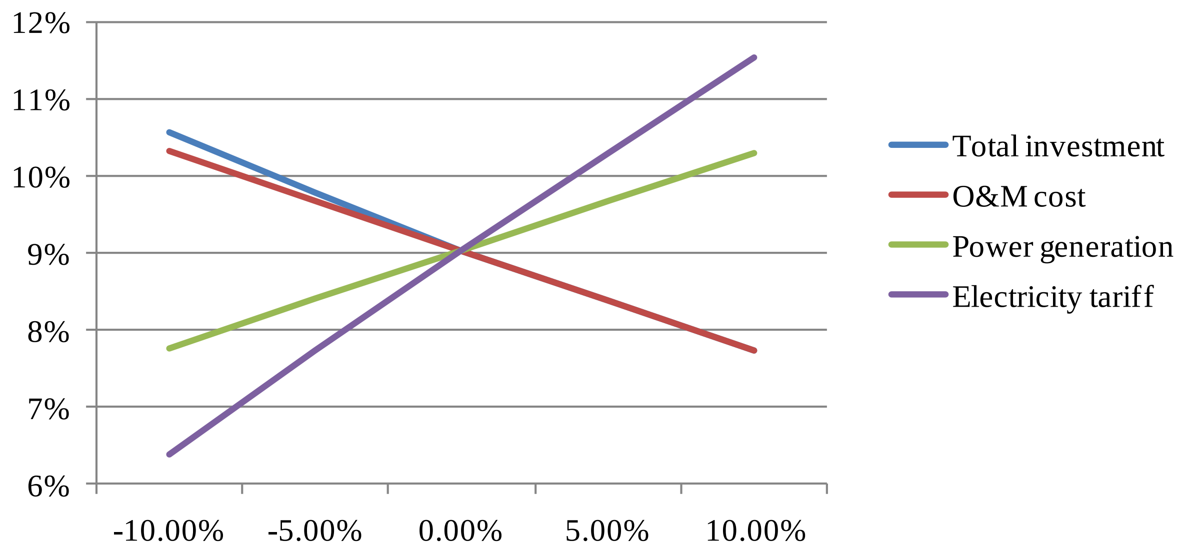

Figure.2 Sensitivity analysis of the project total investment IRR

As shown in the figure.2, the most important factor affecting the financial attractiveness of the proposed CPA is total investment cost, but even if it decreases by -10%, the IRR will reach 10.39%, which is lower than the benchmark (11%) yet. Therefore, the IRR will not reach 11% under the normal condition.

On the other hand, it can be observed that the calculated value of IRR shall be higher than the bench mark (11%) when the tariff of electricity increases 10% due to the increase of income. Nevertheless, it is hardly considered that an abrupt rise of the tariff can be solely happened in China due to the following reasons:

(a) The central and provincial governments promulgate a tariff guideline periodically to avoid the instability of the market since the supply of electric power is a lifeline directly linked to the residents' daily life and the production activity of society;

(b) Even the governments raise the price in the tariff of electricity; it shall take place only with the increase of total GDP of society, disposable income of people, and increase in prices of other merchandises.

That is, the increase of tariff shall accompany an increase of costs of operationcconstrctionrst crediting period r than the benchmark(11%). 10 % oeration and

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maintenance, such as the labor cost, water expenses, expendable supplies and other fees. The values of calculated IRR are 10.9 % and 10.29% respectively when considering 5% and 10% increase of O&M costs for 10% increase of tariff of electricity. This means the project is financially difficult to implement for the IRR is lower than the benchmark (11%).

Effect of CDM registration

Without the support from the CERs revenue, the project IRR will lower than the benchmark IRR, therefore, the proposed CPA does not have any attractive point for investment. For the investors, they would not be interested in this high financially risky project without the CDM support. If the proposed CPA will not be registered as CDM, the barriers of the proposed CPA cannot be overcome.

If the proposed CPA is registered as CDM, the revenue of CERs (according to expected price of 8.5 €/tCO_2e, 10-year crediting period for calculation) will have a great impact on internal rate of return. The project IRR will increase to 12.60% and the financial situation will be improved significantly. Thus commercial viability is enhanced.

Based on all the statements on above, the proposed CPA does not belong to the baseline scenario and could been adopted by additionality.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

The proposed CPA is to recover and utilize the waste heat from cement kilnfor generation of electricity. In the absence of the proposed CPA, the same amount of electricity should be supplied from the regional grid system (CCPG) which is dominated by fossil fuel. Thus, the proposed CPA baseline emissions mainly arise CO_2 emissions from the power generation using the fossil fuel of the grid system (CCPG). And the proposed CPA will use the waste heat to generate power; no auxiliary fossil fuels are needed.

Overview of emission sources included in or excluded from the project boundary is provided in the following table:

	Source	Gas	Including?	Justification / Explanation
Baseline	Grid Power generation	CO_2	Including	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
Project activity	Project activity	CO_2	Excluded	Project activity excluded the auxiliary fuel
		CH_4	Excluded	Excluded for simplification. This is conservative

		N_2O	Excluded	Excluded for simplification. This is conservative

The proposed CPA is located in Sanhui town, Hechuan district, Chongqing city, People Republic of China, which is easily located within the geographical boundary of the registered PoA.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

Data / Parameter:	$EG_{grid,j,y}$
Data unit:	MWh
Description:	The quantity of electricity supplied to the recipient *j* by generator, that in the absence of the project activity would have been sourced from CCPG during the year *y*
Source of data used:	Feasibility study
Value applied:	61,236
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO_2/MWh
Description:	operating margin CO_2 emission factor in year *y*
Source of data used:	Please refer to the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC at http://cdm.ccchina.gov.cn.
Value applied:	1.1255
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the latest version of "Tool to calculate the emission factor for an electricity system (Ver.2)", the proposed project uses the specific national values.
Any comment:	

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor in year *y*
Source of data used:	Please refer to the Report on Determination of Baseline Grid Emission Factor by China DNA NDRC at http://cdm.ccchina.gov.cn.
Value applied:	0.5802
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the latest version of "Tool to calculate the emission factor for an electricity system (Ver.2)", the proposed project uses the specific national values.
Any comment:	

Data / Parameter:	f_{wcm}
Data unit:	-
Description:	The proportion of electricity generated by waste heat accounts for in the total electricity generated
Source of data used:	AMS-III.Q.
Value applied:	1
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to AMS-III.Q., this fraction is 1 if the electricity generation is purely from use of waste energy.
Any comment:	

Data / Parameter:	$Q_{OE,BL}$
Data unit:	MJ/h
Description:	Output energy that can be theoretically produced (in appropriate unit), to be determined on the basis of maximum recoverable energy from the WECM, which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of CDM project activity
Source of data used:	Feasibility study
Value applied:	5,460,000
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$Q_{OE,y}$
Data unit:	MJ/h
Description:	Quantity of actual output energy during year *y* (in appropriate unit)
Source of data used:	Feasibility study
Value applied:	5,460,000
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	Calculation used for f_{cap}

B.5.2. Ex-ante calculation of emission reductions:

CALCULATION OF THE BASELINE CO_2 EMISSION (BE_y)

Baseline scenario for the proposed CPA only take electricity generation into account, hence, there is no thermal supply. Thus, according to the methodology AMS-III.Q., the baseline emissions formula is as follows:

$$BE_y = BE_{elec,y} \quad \text{(AMS-III.Q :1)}$$

Where:

BE_y	Baseline emissions during the year *y* in tons of CO_2
$BE_{elec,y}$	Baseline emissions due to displacement of electricity during the year *y* in tons of CO_2

$$BE_{elec,y} = f_{cap} * f_{wcm} * \sum_j \sum_i (EG_{i,j,y} * EF_{elec,i,j,y}) \quad \text{(AMS-III.Q :2)}$$

Where:

$EG_{i,j,y}$	The quantity of electricity supplied to the recipient *j* by generator, that in the absence of the project activity would have been sourced from i^{th} source (*i* can be either grid or identified source) during the year *y* in MWh
$EF_{elec,i,j,y}$	The CO_2 emission factor for the electricity source *i* (*i*=gr (grid) or *i*=is (identified source)), displaced due to the project activity, during the year *y* in tons CO_2/MWh
f_{wcm}	Fraction of total electricity generated by the project activity using waste energy. This fraction is 1 if the electricity generation is purely from use of waste energy.
f_{cap}	The maximum limit factor is to eliminate the impact of the increased waste heat usage rising from the increased project activity level in year *y*. The factor is related to the project activity level during baseline year before the project started, f_{cap} should be calculated on a basis of the relevant section of methodology ACM0012.

CALCULATION OF CO_2 EMISSION FACTOR ($EF_{elec,i,j,y}$)

According to the methodology AMS.III.Q.(Ver.02), 'Tool to calculate the emission factor for an electricity system' (Ver.02) (hereafter, referred as the Tool) must be used to calculate the project baseline emission factor. Based on the Tool, the calculation is followed as described below:

Step 1: Identify the relevant electric power system

According to the delineation of China DNA, Jiangxi, Henan, Hubei, Hunan, Chongqing and Sichuan are counted as CCPG. The proposed CPA is in Chongqing City, the relevant electric power system of the proposed project activity is CCPG.

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

In Fufeng Company, the electricity for the cement product process has ever been supplied from CCPG, so the proposed CPA should apply Option I: Only grid power plants are included in the calculation.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

Taking dispatching data to analyze OM needs the data from CCPG. Those data needed are confidential and cannot be obtained from public channel that the way of (c) is not applicable for the proposed CPA. Due to shortage of the CCPG load diagram data that the way of (b) is also not applicable. If the low-cost of CCPG / must-run resources constitute more than 50% of total grid generation, the average OM way could be taken. But the actual proportion of the two aspects are respectively 1.46% (2007), 1.52% (2006), 1.58% (2005), 1.64% (2004), 1.66% (2003), thus the way of (d) is not applicable. Because the proportion is lower than 50% that the way of (a) simple OM is applicable to calculate the baseline emission factor of operating margin ($EF_{OM,y}$) for the proposed CPA.

The proposed CPA will use ex-ante data (the latest 3 years data of CCPG to calculate $EF_{OM,y}$. In the first crediting period, the emission factors will not be calculated and updated.

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

(a) Simple OM

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.

The simple OM may be calculated:

Option A: Based on the net electricity generation and a CO_2 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.

Option B can only be used if:

(a) The necessary data for Option A is not available; and
(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and
(c) Off-grid power plants are not included in the calculation (i.e., if Option I has been chosen in Step 2).

The net electricity generation and a CO_2 emission factor of each power unit is not released in China, so it is not available. Moreover, only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known, and off-grid power plants are not included in the calculation. Therefore, Option B is applicable to calculate the operating margin emission factor according to the selected method for the proposed CPA.

Under Option B, the simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2i,y}}{EG_y} \qquad \text{(“Tool”: 7)}$$

Where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWH)
$FC_{i,y}$	Amount of fossil fuel type i consumed by power plant / unit m 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 power plant / unit m in year y (MWh)
i	All fossil fuel types combusted in power plant / unit m in year y
y	Either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on

data vintage in step 3

For this approach (simple OM) to calculate the operating margin, the subscript m refers to the power plants / units delivering electricity to the grid, not including low-cost/must-run power plants / units, and including electricity imports to the grid. Electricity imports should be treated as one power plant *m*.

The Chinese DNA published the latest simple OM emission factor of CCPG, which is calculated according to the above formula will of be adopted in this CPA-DD and its value is 1.1255 (tCO2/MWh).The detail calculation is shown as Annex 3.

Step 5: Identify the cohort of power units to be included in the build margin

The sample group of power units *m* used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or
(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently

The CPA-DD identifies option (b) for sample group of power units *m*, as the information for five power units that have been built most recently is not available in China.

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 the 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.

Option 1 is selected.

As the crediting period for the proposed project is fixed 10 years, the build margin emission factor ex-ante will the only BM emission factor calculated for the proposed project.

Step 6: Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWH) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid\ BM,y} = \frac{\sum_m EG_{m,y} * EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad \text{(“Tool”: 13)}$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	Net quantity of 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 year *y* (tCO_2/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available

Same as the OM, The Chinese DNA published the latest BM emission factor of CCPG, which is calculated according to the above formula will be adopted in this CPA-DD and its value is 0.5802 (tCO_2/MWh) .The detail calculation is shown as Annex 3.

Step 7. Calculate the combined margin emissions factor

The combined margin emissions factor is calculated are as follows:

$$EF_y = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \qquad \text{(“Tool”: 14)}$$

Where:

$EF_{grid,BM,y}$	Build margin CO2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year *y* (MWh)
$EF_{EL,m,y}$	CO2 emission factor of power unit m in year y (tCO_2/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available
$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EF_{grid,OM,y}$	Operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%)

The following default values should be used for w_{OM} and $w_{BM:}$

• Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;
• All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved

Therefore, for the proposed CPA, w_{OM} = 0.5 and w_{BM} = 0.5 are chosen. Then CO_2 emission factor for CCPG: $EF_{Elec,gr,j,y}$ is 0.85285 (tCO_2/MWh). (0.5*1.1255+0.5*0.5802=0.8712)

CALCULATION OF THE MAXIMUM LIMIT FACTOR (f_{cap})

According to description of methodology AMS-III-Q, f_{cap} will be calculated on a basis of the relevant sections in methodology ACM0012.

For a conservative estimate, the methodology requires the categories of project, whether planned, unplanned, or any real increase in production, changes in operating parameters and conditions, fuel type and amount changes, which caused the waste heat increase, should be the determined. For the scheduled increase-capacity project, it is required to apply CDM project individually for the increased part. f_{cap} should be calculated by the following 3 methods. If data sufficient, it is advised to take method 1. For the newly built plant or the built plant but without 3-year production data, it is advised to take method 2. For heat energy of the medium with evidence to prove the portable waste heat/waste pressure cannot be tested directly due to the technical condition limit, it is advised to take method 3.

Method 1: On the condition of a historical heat energy data existing, the baseline scenario emission can be prescribed a limit through the maximum waste heat quantity released to the environment in the past 3 years under a normal operation condition.

Method 2: Take the data from facility supplier to calculate the volume of waste heat/afterheat/residual pressure (typical data from a certain section or the whole plant is ok) produced by manufacturer's facilities. If the project changes or the facility suppliers have no relevant data, it's necessary to hire an independent qualified or certified external process specialist such as a registered engineer to evaluate it, and conservatively estimate the heat produced by unit product during process of producing waste heat/afterheat/residual pressure. Based on the f_{cap} estimated on above mentioned, the DOE responsible for the eligibility of the proposed CPA will exam the assessment report.

Method 3: Usually, the waste heat (such as afterheat, moist heat, reaction heat, combustion heat, etc.), enthalpy contained in portable media or pressure is unlikely to be measured directly. Thus such projects have no relevant historical data. This case can be divided into the following two situations:

Situation 1: The energy is obtained from portable media and converts to final energy by waste heat recovery facility. For that case, use the theoretical maximum value, which can be recovered with the energy recovery equipment, to divide the actual energy generated by the project (can be measured directly), the outcome is $f_{cap..}$ Parameters provided by supplier can be used to calculate the theoretical recovery energy. Also it can be obtained by inviting a qualified or certified external process specialist such as a registered engineer to make an independent technical evaluation.

Situation 2: Energy is obtained from the portable media of the middle energy recovery equipment by intermediate medium. For example, intermediate medium of portable energy from initial portable media includes water, oil or air, etc., these intermediate medium can obtain waste energy from chemical substances (reaction heat) or solid (sensible heat). Those intermediate medium can be used to produce the final energy output in the last waste heat recovery equipment. In such condition, f_{cap} is the ratio of the theoretical maximum recovery energy and the actual energy generated by the project (can be measured directly). Also it can be obtained by hiring a qualified or certified external process specialist such as a registered engineer to make an independent technical evaluation.

According to relevant chapter of ACM0012, the cement production line was built and launched in the next half year of 2007 that there is no relevant historical data of last 3 years before the project started. Therefore, method 1 is unavailable. The collection efficiency of domestic dust removal plant is not high, but this project contains large amount of dust. The wear and tear speed of monitoring instrument for waste heat monitoring is too fast that it needs to change instrument frequently. So the method 2 is also unavailable for technology. The proposed CPA utilizes waste heat boiler to convert waste heat to high-quality steam, and the steam will push turbine engine to generate electricity. Therefore, f_{cap} calculation adopts the method 3 of situation 2.

Calculation of f_{cap} is as follows:

$$f_{cap} = \frac{Q_{OE,BL}}{Q_{OE,y}} \qquad \text{(ACM0012: 1h)}$$

Where:

$Q_{OE,BL}$ Output/intermediate energy that can be theoretically produced (in appropriate unit), to be determined on the basis of maximum recoverable energy from the WECM, which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of CDM project activity

$Q_{OE,y}$ Quantity of actual output/intermediate energy during year *y* (in appropriate unit)

The theoretically produced output energy or energy contained in portable medium. The value is the maximum energy recovered by portable medium theoretically. Those energy cannot be used and discharged directly into air (or portable medium be combusted or wasted) without project activity. For this project, the value is the usable steam heat in principle by steam turbine which can be calculated through steam turbine parameter. According to the project feasibility study, it can be calculated as the $Q_{OE,BL}$ of 5,460,000MJ/h.

$Q_{OE,y}$: The actual output energy or the intermediate medium energy in year *y*. For the proposed CPA, the value should be the steam heat used for power generation during the actual running process.

In this CPA-DD, f_{cap} takes 1 for the ex-ante calculation of emission reductions and its actual value is determined by ex-post monitoring.

Therefore, the ex-ante baseline CO_2 emission (BE_y) is :

$$BE_{elec,y} = f_{cap} * f_{wcm} * \sum_j \sum_i (EG_{i,j,y} * EF_{elec,i,j,y})$$

$$= 1 * 1 * 61,236 * 0.85285$$

$$= 52,225 \ tCO_{2e}$$

CALCULATION OF THE LEAKAGE (LE_y)

According to the AMS-III.Q, the leak is not taken into consideration.

CALCULATION OF THE PROJECT EMISSION (PE_y)

According to the AMS-III.Q, project emissions include emissions due to combustion of auxiliary fuel to supplement waste gas and emissions due to consumption of electricity by the project activity.

If the waste gas contains carbon monoxide or hydrocarbons, other than methane, and the waste gas is vented to the atmosphere in the baseline situation, project emissions have to include CO_2 emissions due to the combustion of the waste gas.

The proposed CPA is to recover the waste heat from cement kiln to generate electricity and there are not use the other auxiliary fuel. The proposed CPA generates electricity by waste heat without the generated carbon dioxide from above combustion, so the emission of the proposed CPA is zero.

CALCULATION OF THE EMISSION REDUCTION (ERy)

According to the methodology AMS-III.Q., the emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad \text{(AMS-III.Q :8)}$$

$$= 52,225 - 0 - 0$$

=52,225 (t CO2e/yr)

Where:

ER_y	Emission reductions in year *y* (t CO2e/yr)
BE_y	Baseline emissions in year *y* (t CO2e/yr)
PE_y	Project emissions in year *y* (t CO2/yr)
LE_y	Leakage emissions in year *y* (t CO2/yr)

B.5.3. Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
2010	0	8,704	0	8,704
2011	0	52,225	0	52,225
2012	0	52,225	0	52,225
2013	0	52,225	0	52,225
2014	0	52,225	0	52,225
2015	0	52,225	0	52,225
2016	0	52,225	0	52,225
2017	0	52,225	0	52,225
2018	0	52,225	0	52,225
2019	0	52,225	0	52,225
2020	0	43,521	0	43,521
Total	**0**	**522,250**	**0**	**522,250**

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

The monitoring plan is based on AMS-III.Q. monitoring methodology developed by the requirements.

The purpose of the development of the monitoring plan

In order to obtain real, credible and certified emission reductions, it's necessary for corporate managers to ensure the normal operation of the project to obtain the required data for calculating emission reductions of the proposed CPA.

To monitor the implementation of the program

The monitoring plan is carried out by the completion of the project owners with the help of Service Center.

With the approval by the DOE and buyers, during initial operation and the project cycle, project owners can modify and update the monitoring manual in accordance with the requirements of the project operation.

Monitoring System

The main monitoring content:

(1) Net power supply of generating units

All ammeters to be used should be calibrated ammeters, according to requirements of "People's Republic of China National Test Measures Regulations" (JJG596-1999), the ammeter should be calibrated by the qualified entities each year. Ammeter accuracy is up to grade of 0.2. Generating units installed the ammeter at the entrance to measure the gross power generation. Installing the ammeters in the company substation is to measure the net power from generating units.

(2) Waste heat utilized

To calculate the medium material enthalpy before entering into waste heat boiler in year *y* and material medium enthalpy of steamer supplied from the waste heat boiler through monitoring the medium's flow, temperature and pressure, etc. and the difference for those two numerical values is waste heat volume consumption in year *y*. Install a thermodynamic instrument group at inlet of the waste heat boiler. Record thermodynamic parameters of the medium entered into boiler, including flow, temperature and pressure. Install another thermodynamic instrument unit at inlet of the turbine. Record thermodynamic parameters of the medium from waste heat boiler, including flow, temperature and pressure.

The main instrument of measurement and inspection is conducted by Fufeng Company and Service Center. In the future operation if there is no party or representatives appointed by both sides on the spot, these instruments cannot be altered. The installed instruments will check in accordance with the maintenance schedule for checking set at the beginning of the development of the project running and the maintenance schedule should be adjusted or updated in accordance with the requirements of practical operation for this enterprise.

Information collection and management

Fufeng Company's responsibility is to provide required data for verification and certification. All measured data should be properly recorded and kept. All measurements should be collected and preserved by the Technology Center of Fufeng Company.

All the changes within the project boundary, such as space or equipment changes should be recorded. And any change of emissions caused by these changes should also be recorded. Records of the information should be preserved and maintained with a backup by Fufeng Company and Service Center for the verification of DOE.

Management

CDM project manager will be appointed by general manager, with overall responsibility for project monitoring, including recording the net power supply of generating units and the waste heat utilization, checking thermodynamic instrument units, holding electricity generation invoices and calculating emission reductions.

The manager of the CDM Service Center and waste heat recovery power plant director enter with a CDM project manager, and post the CDM monitoring representative and inspectors in charge from Service Center and Fufeng Company by one.

CDM monitoring inspectors are responsible for monitoring electricity and recording the daily operation of power generation equipment. People in charge of monitoring should attend professional technical training. Someone in charge of checking coordinates with local power sector to check the measurement equipments including ammeter, and completes the work record. General manager of the project conducts inspection on records and reports on a regular basis.

Monitoring the implementation of the operation and management-level chart is as follows:

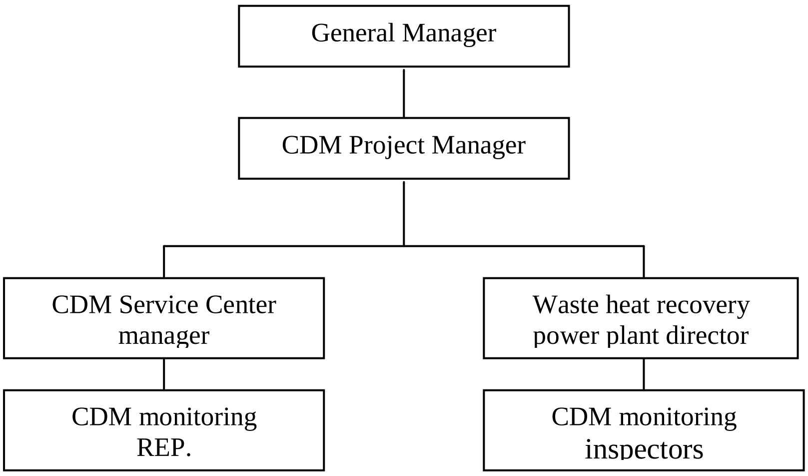

Figure.3. Monitoring the implementation of the operation and management-level chart

Monitoring manual

Monitoring manual is required to include the following content:

- Establishing and maintaining a reliable system to monitor the project net generation and utilized waste heat.
- Quality control of measurement
- Calculation on GHG Emission reductions procedure on a regular basis
- Composition and responsibilities of monitoring staff
- Data collection and archiving system
- ·Cooperation with DOE for verification and certification works

Executor for monitor plan

As the project owner, Fufeng Company is the executor of the proposed CPA plan. The plan will be the guidance of project operation and monitoring emission reductions to ensure that process of emission reductions monitoring is reliable, transparent and conservative.

To verify the results of monitoring

The major tasks to verify the results of the proposed CPA monitoring are as follows:

• Sign the agreement with the DOE of who verify the project emission reductions, then follow the verification schedule required by the buyer and Executive Board of CDM in the project emission reduction crediting period.

• According to the DOE requirement, project owner needs to provide entire information of emission reduction for verification respectively before, during and after verification.

• The project owner actively cooperates with DOE to complete the verification work and designate a person as liaison officer for DOE, fully responsible for all issues of monitoring and verification.

Data and parameters monitored:

Data / Parameter:	$EG_{grid,j,y}$
Data unit:	MWh
Description:	The quantity of electricity supplied to the recipient *j* by generator, that in the absence of the project activity would have been sourced from CCPG during the year *y*
Source of data to be used:	Fusibility study
Value of data	61,236
Description of measurement methods and procedures to be applied:	Ammeter operates online measurement of net generating capacity in power generation projects system (there is standby ammeter), the electricity operator of project company records and keep power generation data in the form of electronic document, the time for archive data is the crediting period and its following two years. Please refer the specific procedures to the CDM monitoring manual.
QA/QC procedures to be applied:	All ammeters should be calibrated by using the ammeter, according to ammeter "People's Republic of China national test measures a point of order" (JJG596-1999) requirements, with the qualified entity to conduct a calibration each year. Power measurement data recorded by the local power supply bureau of the ministry of finance data and supply of electricity sales invoices to carry out cross-validation.
Any comment:	

Data / Parameter:	$T_{steam,i,y}$
Data unit:	˚C
Description:	steam temperature into the steam engine
Source of data to be used:	Thermometer readings
Value of data	
Description of measurement methods and procedures to be applied:	The data is the hourly thermometer reading, monthly record. Keep the record for 2 years when the crediting period closed
QA/QC procedures to be applied:	Test and calibrate the thermometer according to relevant technical regulations regularly
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$P_{steam,i,y}$
Data unit:	MPa
Description:	Steam pressure into the steam engine
Source of data to be used:	Manometer reading
Value of data	
Description of measurement methods	

and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$F_{steam,i,y}$
Data unit:	t/h
Description:	Steam flow into the steamer
Source of data to be used:	Steam meter reading
Value of data	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$T_{water,i,y}$
Data unit:	˚C
Description:	Hot water temperature into the waste heat boiler
Source of data to be used:	Temperature reading
Value of data	
Description of measurement methods and procedures to be applied:	The data is the hourly thermometer reading, monthly record. Keep the record for 2 years when the crediting period closed
QA/QC procedures to be applied:	Test and calibrate the thermometer according to relevant technical regulations regularly
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$P_{water,i,y}$
Data unit:	MPa
Description:	Hot water pressure into the waste heat boiler
Source of data to be used:	Manometer reading
Value of data	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	Calculation used for f_{cap}

Data / Parameter:	$F_{water,i,y}$
Data unit:	t/h
Description:	Hot water flow into the waste heat boiler
Source of data to be used:	Flowmeter reading
Value of data	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	Calculation used for f_{cap}

SECTION C. Environmental Analysis

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

Environmental Analysis is done at CPA level.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

According to Chinese law, all construction projects should be carried out Environmental Impact Assessment(EIA) Report in China. The EIA Report of the proposed CPA was completed by Chongqing Yu-Jia Environmental Impact Assessment Ltd, and approved by Environmental Protection Agency of Hechuan District Chongqing City on 24/05/2008 (Document No.: Yu(Hechuan) Environmental Approval [2008] 16).

According to the EIA Report, environmental impacts possibly caused by the Project and protect and guard measures adopted by the project owner are analyzed as follows:

Noise:

The turbo-generator room of the proposed CPA using semi-closed plant. By closing most of the doors and windows to reduce noise spill, at the same time, by planting the trees and green vegetation around the factory to play a role in shielding so that the plant can be spread to all sectors outside noise is lower than 50dB (A).By installing noise reduction devices on waste heat boiler to control the noise level under the national standard. The control rooms using soundproof working rooms for achieving the standard working requests.

Waste Water:

This works in the production process does not directly generate a large number of waste water, only 3.8m^3/h waste water generated in the water treatment chemicals of boiler feed water and the links of waste heat boiler to cool. 14.4 m^3/ h waste water generated in the circulation cooling system. This part of the waste water does not contain toxic substances, and discharged into the nearest existing network of drains. Better water quality of waste water generated in circulating water system, which can be used on spraying and dust settling by conditioning tower.

Air:

This dust by the proposed CPA discharge, mainly generated in the process which is the waste gas from kiln rear pass through waste heat boiler. The cement kiln environmental conditions, there is no newly increased dust and SO_2 in the proposed CPA, the emissions of SO_2 from kiln rear is close to zero, and because of the dust settling's function of waste heat boiler, the Effect of Dust Collecting of the kiln rear is further improved, has a role in reducing emissions.

Solid Waste:

The waste heat recovery power plant does not generate solid waste in the production process.

To sum up, the implementation of the proposed CPA can not only reduce the emissions of GHG but also further improve the local environment.

The proposed CPA has no transboundary impact.

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

The project is utilization of waste gas and waste heat, almost do not need any fuel and raw materials, energy-saving effect is very significant, will not have a negative impact on the environment, the project will achieve the large environment and social benefits, not existing significant environmental impact and factors which restrict the project's construction and operation, the project has positive impact to the local environment on the whole.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form..

Local stakeholder consultation is done at CPA level

D.2. Brief description how comments by local stakeholders have been invited and compiled:

In order to understand the stakeholders' attitude of the project, listen to public opinion, Service Center issued the use and recovery of the questionnaire method to investigate the stakeholders. Participants invited in this investigation are following units:

- Local Government
- On behalf of the residents in the vicinity of
- The local power sector
- Project & Engineering Design Institution
- Consulting Institution

The questionnaire includes the following:

(1) A brief description of the project (to be on the location of power generating equipment, installed capacity, with a total investment of the project)

(2) Basic information of the investigated targets

(3) Questions:

(a) In your opinion, currently how about the surrounding environment?

(b) Construction of the project which brings benefit or adverse effects on the surrounding environment?

(c) Whether the project has a negative impact on local life?

(d) Whether or not to make the project in the vicinity of the television signal, and so affected?

(e) Do you agree with the construction of the project?

(f) Do you have any other comments and suggestions?

D.3. Summary of the comments received:

A total of 100 questionnaires were issued, the recovery rate is 100%. Findings are as follows:

item	amount	rate
Basic information of the investigated targets		
Sex		
Male	64	64%
Female	36	36%
Age		
Under 30	17	17%
From 30 to 40	51	51%
From 41 to 50	18	18%
Over 50	14	14%
Occupation		
Electricity sector	12	12%
Design units	10	10%
Government departments	13	13%
Local residents	55	55%
Questions		
(a) In your opinion, currently how about the surrounding environment?		
Choose ‘Superior’, ‘Good’	47	47%
Choose ‘quite’, ‘bad’	53	53%
(b) Construction of the project which brings benefit or adverse effects on the surrounding environment?		
Choose air and/or water and/or noise	2	2%
Non choose any item	98	98%
(c) Whether the project has a negative impact on local life?		
Yes	96	96%
No	4	4%
(d) Whether or not to make the project in the vicinity of the television signal, and so		

item	amount	rate
affected?		
Yes	8	8%
No	92	92%
(e) Do you agree with the constrction of the project?		
Yes	100	100%
No	0	0%
(f) Do you have any other comments and suggestions?		
There are no negative comments and suggestions for the CPA project		

Findings of the investigation indicate that the project has been greatly supported by the local residents and government. All of them expressed their support and concern on the construction of the waste heat recovery power generation project.

Through the exclusive interview and forum in the project area, respondents generally agree that there is no negative impact of the proposed CPA not only for the environment but can significantly improve the atmospheric environmental quality of the area around the proposed CPA. The project is to meet local, The proposed CPA for the local characteristics of the environment, identify a suitable site, design a scientific and rational planning, strict management so as to avoid the detrimental effect and gross pollution for local surface water, ground water and surrounding ecological environment when the project be constructed in process or future operations processes; the project has a good social, economic and environmental benefits.

D.4. Report on how due account was taken of any comments received:

Due to the great support for the proposed CPA from the local residents and local government, there is no objection, the evaluation received from stakeholders. Therefore, at present the project does not need any adjustment.

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	Chongqing Fufeng Cement Group Co., Ltd.
Street/P.O.Box:	No.60, Xinguang Rd. Beibu xinqu
Building:	19 F, Jinxing Building
City:	Hechuan County
State/Region:	Chongqing
Postfix/ZIP:	401121
Country:	People's Republic of China
Telephone:	+86-23-67885032
FAX:	+86-23-63118730
E-Mail:	Dongchuanxue8888@163.com
URL:	http://fufeng123.c-bm.com
Represented by:	
Title:	Executive Vice General Manager
Salutation:	Mr.
Last Name:	Dong
Middle Name:	-
First Name:	Chuanxue
Department:	Office
Mobile:	+86-138-8521-7448
Direct FAX:	+86-23-63118730
Direct tel:	+86-23-67885032
Personal E-Mail:	908287749@qq.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project is not involved with the official development assistance funds of Annex I countries.

Annex 3
BASELINE INFORMATION

OM calculation

CCPG simple OM calculation in 2005

Fuel type	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Sub-total	Emission factor	Oxidation Rate	Fuel emission factor	Average NCV	CO_2 emission(tCO_2e)
									(tc/TJ)	(%)	($kgCO_2$/TJ)	(MJ/t, m^3)	L=G*J*K/10000 mass unit
		A	B	C	D	E	F	G=A+B+C +D+E+F	H	I	J	K	L= G*J*K /1000 volume unit
Raw coal	10*kt	1869.29	7638.87	2732.15	1712.27	875.4	2999.77	17827.75	25.8	100	87,300	20,908	325,404,287
Washed coal	10*kt	0.02						0.02	25.8	100	87,300	26,344	460
Other washed coal	10*kt		138.12			89.99		228.11	25.8	100	87,300	8,363	1,665,408
Coke	10*kt		25.95		105			130.95	29.2	100	95,700	28,435	3,563,450
Coke oven gas	100*Mm^3			1.15		0.36		1.51	12.1	100	37,300	16,726	94,206
Other coke gas	100*Mm^3		10.2			3.12		13.32	12.1	100	37,300	5,227	259,696
Crude oil	10*kt		0.82	0.36				1.18	20	100	71,100	41,816	35,083
Gasoline	10*kt		0.02			0.02		0.04	18.9	100	67,500	43,070	1,163
Diesel	10*kt	1.3	3.03	2.39	1.39	1.38		9.49	20.2	100	72,600	42,652	293,861
Fuel oil	10*kt	0.64	0.29	3.15	1.68	0.89	2.22	8.87	21.1	100	75,500	41,816	280,035
LPG	10*kt							0	17.2	100	61,600	50,179	0
Refinery gas	10*kt	0.71	3.41	1.76	0.78			6.66	15.7	100	48,200	46,055	147,842
Natural gas	100*Mm^3						3	3	15.3	100	54,300	38,931	634,186
Other oil	10*kt							0	20	100	75,500	41,816	0
Other coke	10*kt				1.5			1.5	25.8	100	95,700	28,435	40,818
Others	10*ktce		2.88		1.74	32.8		37.42	0	0	0	0	0
												Total (M)	**332,420,496**

Data source: China Energy Statistical Yearbook 2006.

CPG thermal generation in 2005

Province	Generation (MWh)	Self consumption rate (%)	Delivery generation (MWh)
Jiangxi	30,000,000	6.48	28,056,000
Henan	131,590,000	7.32	121,957,612
Hubei	47,700,000	2.51	46,502,730
Hunan	39,900,000	5	37,905,000
Chongqing	17,584,000	8.05	16,168,488
Sichuan	37,202,000	4.27	35,613,475
		Sub-total (N)	**286,203,305**

Total emission	(M)	332,420,496	tCO2e
Supply to the CCPG	(N)	286,203,305	MWh
OM Emission Factor of CCPG	(=M/N)	**1.16148**	tCO2e/ MWh

Data source: China Electric Power Yearbook 2006.

CCPG simple OM calculation in 2006

Fuel type	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Sub-total	Emission factor	Oxidation Rate	Fuel emission factor	Average NCV	CO_2 emission(tCO_2e)
									(tc/TJ)	(%)	($kgCO_2$/TJ)	(MJ/t, m^3)	L=G*J*K/10000 mass unit
		A	B	C	D	E	F	G=A+B+C +D+E+F	H	I	J	K	L= G*J*K /1000 volume unit
Raw coal	10*kt	1926.02	8098.01	3179.79	2454.48	1184.3	3285.22	20127.82	25.8	100	87,300	20,908	367,386,738
Washed coal	10*kt					5.79		5.79	25.8	100	87,300	26,344	133,160
Other washed coal	10*kt	4.51	104.12		8.59	79.21		196.43	25.8	100	87,300	8,363	1,434,116
Briquette coal	10*kt						0.01	0.01	26.6	100	87,300	20,908	183
Coke	10*kt		17.23		0.32			17.55	29.2	100	95,700	28,435	477,576
Coke oven gas	100*Mm^3		0.52	1.07	4.24	0.38	0.01	6.22	12.1	100	37,300	16,726	388,053
Other coke gas	100*Mm^3	12.69	3.95		1.7	4.36	0.01	22.71	12.1	100	37,300	5,227	442,770
Crude oil	10*kt		0.49					0.49	20	100	71,100	41,816	14,568
Gasoline	10*kt		0.01					0.01	18.9	100	67,500	43,070	291
Diesel	10*kt	0.91	2.23	1.41	1.78	0.96		7.29	20.2	100	72,600	42,652	225,737
Fuel oil	10*kt	0.51	1.26	1.31	0.8	0.57	3.49	7.94	21.1	100	75,500	41,816	250,674
LPG	10*kt							0	17.2	100	61,600	50,179	0
Refinery gas	10*kt	0.86	8.1	1	0.97			10.93	15.7	100	48,200	46,055	242,630
Natural gas	100*Mm^3			0.28		0.16	18.63	19.07	15.3	100	54,300	38,931	4,031,309
Other oil	10*kt							0	20	100	75,500	41,816	0
Other coke	10*kt						0.01	0.01	25.8	100	95,700	28,435	272
Others	10*ktce	17.45	37.36	31.55	18.29	29.35		134	0	0	0	0	0
												Total (M)	**375,028,077**

Data source: China Energy Statistical Yearbook 2007.

CCPG thermal generation in 2006

Province	Generation (MWh)	Self consumption rate (%)	Delivery generation (MWh)
Jiangxi	34,449,000	6.17	32,323,497
Henan	151,235,000	7.06	140,557,809
Hubei	54,841,000	2.75	53,332,873
Hunan	46,408,000	4.95	44,110,804
Chongqing	23,487,000	8.45	21,502,349
Sichuan	44,193,000	4.51	42,199,896
		Sub-total (N)	**334,027,226**

Imported power from NWPG	(N)	3,028,950	MWh
OM Emission Factor of NWPG	(O)	0.99148	tCO2e/ MWh
Total emission	(P=M+N*O)	378,031,235	tCO2e
Supply to the CCPG	(Q)	337,056,176	MWh
OM Emission Factor of CCPG	(=P/Q)	**1.12157**	tCO2e/ MWh

Data source: China Electric Power Yearbook 2007.

CCPG simple OM calculation in 2007

Fuel type	Unit	Jiangxi A	Henan B	Hubei C	Hunan D	Chongqing E	Sichuan F	Sub-total G=A+B+C+D+E+F	Emission factor (tc/TJ) H	Oxidation Rate (%) I	Fuel emission factor ($kgCO_2/TJ$) J	Average NCV ($MJ/t, m^3$) K	CO_2 emission(tCO_2e) L=G*J*K/10000 mass unit L= G*J*K /1000 volume unit
Raw coal	10*kt	2200.57	9357	3479.81	2683.81	1547.7	3239	22507.89	25.8	100	87,300	20,908	410,829,404
Washed coal	10*kt		3.07			3.8		6.87	25.8	100	87,300	26,344	157,998
Other washed coal	10*kt	0.04	87.16		2.06	96.42		185.68	25.8	100	87,300	8,363	1,355,631
Briquette coal	10*kt						0.01	0.01	26.6	100	87,300	20,908	183
Coke	10*kt							0	29.2	100	95,700	28,435	0
Coke oven gas	$100*Mm^3$	0.08	2.61	0.25	0.31	0.91		4.16	12.1	100	37,300	16,726	259,534
Other coke gas	$100*Mm^3$	29.17	25.79		24.69		23.98	103.63	12.1	100	37,300	5,227	2,020,444
Crude oil	10*kt		0.43					0.43	20	100	71,100	41,816	12,784
Gasoline	10*kt				0.04	0.01		0.05	18.9	100	67,500	43,070	1,454
Diesel	10*kt	0.98	3.21	2.51	2.83	1.93		11.46	20.2	100	72,600	42,652	354,863
Fuel oil	10*kt	0.42	1.25	1.33	0.63	0.64	1.74	6.01	21.1	100	75,500	41,816	189,742
LPG	10*kt							0	17.2	100	61,600	50,179	0
Refinery gas	10*kt	1.43	10.01	0.97	0.7			13.11	15.7	100	48,200	46,055	291,022
Natural gas	$100*Mm^3$		0.12	0.18		0.2	1.87	2.37	15.3	100	54,300	38,931	501,007
Other oil	10*kt							0	20	100	75,500	41,816	0
Other coke	10*kt							0	25.8	100	95,700	28,435	0
Others	10*ktce	23.43	63.65	35.95	29.46	23.21		175.7	0	0	0	0	0
												Total (M)	**415,974,066**

Data source: China Energy Statistical Yearbook 2008.

CCPG thermal generation in 2007

Province	Generation (MWh)	Self consumption rate (%)	Delivery generation (MWh)				
Jiangxi	42,100,000	7.72	38,849,880	Imported power from NWPG	(N)	3,005,400	MWh
Henan	177,300,000	7.55	163,913,850	OM Emission Factor of NWPG	(O)	1.01129	tCO2e/ MWh
Hubei	60,900,000	6.69	56,825,790	Total emission	(P=M+N*O)	419,013,395	tCO2e
Hunan	54,200,000	7.18	50,308,440	Supply to the CCPG	(Q)	380,239,080	MWh
Chongqing	28,800,000	9.2	26,150,400	OM Emission Factor of CCPG	(=P/Q)	**1.10197**	tCO2e/ MWh
Sichuan	45,100,000	8.68	41,185,320				
		Sub-total (N)	**377,233,680**				

Data source: China Electric Power Yearbook 2008.

Finally, the weighted average emission factor of the three years is: $EF_{OM,y}$ = ***1.12553*** *tCO_2/MWh.*

BM calculation

Step (1): Calculation of the share of CO_2 emissions from solid, liquid and gaseous fuels.

Fuel type	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Sub-total	Average NCV (MJ/t, m^3)	Fuel emission factor ($kgCO_2$/TJ)	Oxidation Rate (%)	CO_2 emission (tCO_2e)	Ratio (%)
		A	B	C	D	E	F	G=A+B+C +D+E+F	H	I	J	K= G*H*I*J /1000	
Raw coal	10*kt	2200.57	9357	3479.81	2683.81	1547.7	3239	22507.89	20,908	87,300	100	410,829,404	
Washed coal	10*kt	0	3.07	0	0	3.8	0	6.87	26,344	87,300	100	157,998	
Other washed coal	10*kt	0.04	87.16	0	2.06	96.42	0	185.68	8,363	87,300	100	1,355,631	
Briquette coal	10*kt	0	0	0	0	0	0.01	0.01	20,908	87,300	100	183	
Coke	10*kt	0	0	0	0	0	0	0	28,435	95,700	100	0	
Other coke products	10*kt	0	0	0	0	0	0	0	28,435	95,700	100	0	
											Sub-total	412,343,216	99.13
Crude oil	10*kt	0	0.43	0	0	0	0	0.43	41,816	71,100	100	12,784	
Gasoline	10*kt	0	0	0	0.04	0.01	0	0.05	43,070	67,500	100	1,454	
Diesel	10*kt	0.98	3.21	2.51	2.83	1.93	0	11.46	42,652	72,600	100	354,863	
Fuel oil	10*kt	0.42	1.25	1.33	0.63	0.64	1.74	6.01	41,816	75,500	100	189,742	
Other oil products	10*kt	0	0	0	0	0	0	0	41,816	75,500	100	0	
											Sub-total	558,843	0.13
Natural gas	10*Mm^3	0	1.2	1.8	0	2	18.7	23.7	38,931	54,300	100	501,007	
Coke oven gas	10*Mm^3	0.8	26.1	2.5	3.1	9.1	0	4.16	16,726	37,300	100	259,534	
Other coke gas	10*Mm^3	291.7	257.9	0	246.9	0	239.8	1036.3	5,227	37,300	100	2,020,444	
LPG	10*kt	0	0	0	0	0	0	0	50,179	61,600	100	0	
Refinery gas	10*kt	1.43	10.01	0.97	0.7			13.11	46,055	48,200	100	291,022	
											Sub-total	3,072,007	0.74
											Total	**415,974,066**	**100**

Step (2): Calculating of Emission Factor for Various Power Plant

Type	Variable	Power supply efficiency (%)	Emission Factor (tc/TJ)	Oxidation Rate (%)	Emission Factor (tCO_2/MWh)
		A	B	C	D=3.6/A/1,000,000×B×C
Coal-fired	$EF_{Coal,Adv,y}$	38.10	87,300	100	0.8249
Gas-fuel	$EF_{Oil,Adv,y}$	49.99	75,500	100	0.5437
Oil-fuel	$EF_{Gas,Adv,y}$	49.99	54,300	100	0.3910

$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal, Adv} + \lambda_{Oil} \times EF_{Oil, Adv} + \lambda_{Gas} \times EF_{Gas, Adv} = 0.8213\ tCO_2/MWh$

Step (3): Calculation BM in the Grid.

CCPG Installed Capacity in 2007

Installed Capacity	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Total
Thermal power	MW	9,270	38,540	13,040	13,360	6,370	12,000	92,580
Hydro	MW	3,570	2,740	24,020	9,220	2,240	19,860	61,650
Nuclear	MW	0	0	0	0	0	0	0
Wind farm and other	MW	0	0	10	17	24	0	51
Total	MW	12,840	41,280	37,070	22,597	8,634	31,860	154,281

Data source: China Electric Power Yearbook 2008.

CCPG Installed Capacity in 2006

Installed Capacity	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Total
Thermal power	MW	6,568	32,603	11,623	10,715	5,594	9,555	76,658
Hydro	MW	3,288	2,553	18,320	8,648	1,979	17,730	52,518
Nuclear	MW	0	0	0	0	0	0	0
Wind farm and other	MW	0	0	0	17	24	0	41
Total	MW	9,856	35,156	29,943	19,380	7,597	27,285	129,217

Data source: China Electric Power Yearbook 2007.

CCPG Installed Capacity in 2005

Installed Capacity	Unit	Jiangxi	Henan	Hubei	Hunan	Chongqing	Sichuan	Total
Thermal power	MW	5,906	26,267.8	9,526.3	7,211.6	3,759.5	7,496	60,167.2
Hydro	MW	3,019	2,539.9	17,888.9	7,905.1	1,892.7	14,959.6	48,205.2
Nuclear	MW	0	0	0	0	0	0	0
Wind farm and other	MW	0	0	0	0	24	0	24
Total	MW	8,925	28,807.7	27,415.2	15,116.7	5,676.2	22,455.6	108,396.4

Data source: China Electric Power Yearbook 2006.

CCPG BM Calculation

	Installed capacity of 2005	Installed capacity of 2006	Installed capacity of 2007	Newly installed capacity from 2005 to2007	Share of the Newly installed capacity
	A	B	C	D=C-A	
Thermal(MW)	60,167.2	76,658	92,580	32,412.8	70.64%
Hydro(MW)	48,205.2	52,518	61,650	13,444.8	29.30%
Nuclear(MW)	0	0	0	0	0.00%
Wind farm(MW)	24	41	51	27	0.06%
Total (MW)	**108,396.4**	**129,217**	**154,281**	**458,84.6**	**100.00%**
Percent of the installed capacity of 2007	70.26%	83.75%	100%		

$EF_{BM,y} = 0.8213 \times 70.642\% = \mathbf{0.5802}\ tCO2e/MWh$

Annex 4

MONITORING INFORMATION

Refer to the section B.6.