CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

A. General description of the small scale project activity

B. Application of a baseline and monitoring methodology

C. Duration of the project activity / crediting period

D. Environmental impacts

E. Stakeholders' comments

Annexes

Annex 1: Contact information on participants in the proposed small scale project activity

Annex 2: Information regarding public funding

Annex 3: Baseline information

Annex 4: Monitoring Information

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• 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>.
03	22 December 2006	• 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.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

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Title: Energy saving project through Coal Moisture Control (CMC) technique at Yunnan Dawei Coking Co., Ltd. in Yunnan, China
Current version of the document: 1.0
Date of the document was completed: 26/12/2010

A.2. Description of the small-scale project activity:

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Energy saving project through Coal Moisture Control (CMC) technique (hereinafter referred to as the proposed project) is developed by Yunnan Dawei Coking Co., Ltd. (hereinafter referred to as the project owner) in Yunnan, China. The project owner invests 79 million RMB for installing the Coal Moisture Control (CMC) technique with 2.7 million tonnes of coal moisture control capacity into the coke producing line, which produces 2 million tonnes of coke annually. As the proposed project was implemented, flue gas, desorption gas and carbon-rich gas are utilized for reducing the material coal moisture in CMC equipment; therefore the use of COG in coke ovens is saved and it leads to the reduction of GHG emission from coke ovens.

Among those gases, the temperature of flue gas is high enough for using in the CMC equipment directly; in contrast that of the rest of gases is not so high that used after burned. Then those gases are mixed and supplied to the CMC equipment altogether. The heat is utilized for drying the part of material coal moisture before coking in coke ovens.

The material coal thrown into coke ovens has lower moisture than before; therefore less COG is needed for coking in the coke ovens. As a result, the 8,316 tCO_2e of GHG will be reduced annually, and it corresponds to the 83,16 0tCO_2e of GHG emission reduction in total during the crediting period.

Owing to the implementation of the proposed project, it could be reduced the part of the consumption of the electricity purchased from China Southern Power Grid (CSPG) with big environmental load. Hence it leads to reducing emissions of some significant air pollutants like SO2, NOx and dust, for instance. In addition, the amount of the discharged water from coke ovens is reduced by approximately 77,000t annually owing to the less moisture of material coal after implementation of the proposed project.

There is no precedent that installs the CMC equipment into coke production line, except for steel industry in China. Therefore, when the proposed project would be completed as scheduled, it would be the first of its kind for introducing CMC equipment among the coke production line in China.

Contribution to the sustainable development:

- The proposed project will improve the coke production efficiency by utilizing the waste resources and reduce the energy consumption. Therefore, the proposed project will contribute to an effective use of energy in the host party.

- The proposed project will reduce the waste water from coke oven owing to the installation of the CMC equipment. Consequently, material coal moisture before coke oven will be reduced, so that less amount of waste water will be discharged from coke oven.

- The proposed project will lower the dependency on coal. It will not only save energy but also mitigate environmental pollution, which will contribute to achievement on the goal of emission reduction in China's 11th five-year plan.

A.3. Project participants:

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The participants involved in the proposed project are shown in Table A.1.

Table A.1 Project participants

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)
P. R. China (host)	Yunnan Dawei Coking Co., Ltd.	No
Japan	Tepia Corporation Japan Co., Ltd.	No

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

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A.4.1.1. Host Party(ies):

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P. R. China

A.4.1.2. Region/State/Province etc.:

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Yunnan province

A.4.1.3. City/Town/Community etc:

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Qujing City

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

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The proposed project activity is located at Qujing City (shown in Fig.A.1. as Zhanyi County), in the northeast of Yunnan province. The longitude is 103° 52′ and the latitude is 25° 41′ . Project site seat is 168km away from Kunming city (capital city of Yunnan province).

Fig. A.1 Geographical location of the project site in Yunnan province, P. R. China.

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

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Type II: Energy Efficiency Improvement Projects
Category AMS II: D, "Energy Efficiency and Fuel Switching Measures for Industrial Facilities"
Version: 12, Sectoral Scope 4.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

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The project activity is expected to reduce the GHG emission by 8,316 tCO2e annually. The total GHG emission reduction over the 10-year crediting period is 83,160 tCO2e.

Table A.3 Estimated emission reductions of the proposed project.

Year	Annual estimation of emission reductions (tonnes of CO_2 e)
2011/7/1~2011/12/31	4,158
2012	8,316
2013	8,316
2014	8,316
2015	8,316
2016	8,316
2017	8,316
2018	8,316
2019	8,316
2020	8,316
2021/1/1~2021/6/30	4,158

Total estimated reductions (tonnes of CO2e)	83,160
Total number of crediting years	10
Annual average of the estimated reductions over crediting period (tonnes of CO2e)	8,316

A.4.4. Public funding of the small-scale project activity:

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No public fund from Annex I Party is involved in this project.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

The proposed project is not a debundled component of a large-scale project activity compared to the conditions in *Appendix C* of the *Simplified modalities and procedures for small-scale CDM project Activities*. Then, according to the appendix, "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:

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

The project proponent has not registered or applied to register another CDM project activity with the same project participants in the same project category and technology or measure within the previous 2 years and whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

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Approved baseline and monitoring methodology AMS-II.D.: "Energy efficiency and fuel switching measures for industrial facilities" --- Version 12 as valid from 18 Dec 2009.

For more information regarding the methodology please refer to UNFCC website:
http://cdm.unfccc.int/methodologies/DB/U8L8P68DK81OUF5X0KOR212O09NXYC/view.html

B.2 Justification of the choice of the project category:

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As per Appendix B of the simplified modalities and procedures for small scale CDM project activities, the small scale methodology AMS II.D i.e. "Type II – Energy efficiency improvement projects of Category II.D – Energy efficiency and fuel switching measures for industrial facilities" (Version 12) has been selected for the project activity as it meets the following requirements:

Requirements	Justification
This category comprises any energy efficiency and fuel switching measure implemented at a	The proposed project aims to improve the energy efficiency in the coke ovens by introducing CMC

single industrial or mining and mineral production facility.	system. It saves use of energy and mitigates environmental pollution through reducing the use of COG.
This category covers project activities aimed primarily at energy efficiency; a project activity that involves primarily fuel switching falls into category III.B.	The main purpose of the proposed project is reducing the use of COG in the coke ovens by improving the coking efficiency. Therefore, the proposed project is not applicable for category III. B.
The measures may replace, modify or retrofit existing facilities or be installed in a new facility.	The proposed project installs a new CMC system into the existing coke manufacturing plant.
This category is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g., electricity and/or fossil fuel consumption).	The amount of moisture contained in the raw coal input into and output from CMC equipment is measurable in real time. The consumption of electricity and raw coal is also recorded and measured in the project boundary by the project owner.
This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	Before and after the implementation of the proposed project, there is no change in the need of heat. So the impact of CMC system can be clearly distinguished from changes in energy use due to other variables not influenced by it.
The aggregate energy savings of a single project (inclusive of a single facility or several facilities) may not exceed the equivalent of 60 GWhe per year. A total saving of 60 GWhe per year is equivalent to a maximal saving of 180 GWhth per year in fuel input.	The proposed project is smaller than 180 GWhth per year in fuel input.

B.3. Description of the project boundary:

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According to AMS-II.D., the project boundary is the physical, geographical site of the industrial or mining and mineral production facility(ies), process or equipment that are affected by the project activity. In terms of the proposed project, the project boundary could be determined as CMC system, coke ovens and conveyor of material coal in the plant and the CSPG for consuming the electricity in the proposed project from the grid. The following figure represents the project boundary.

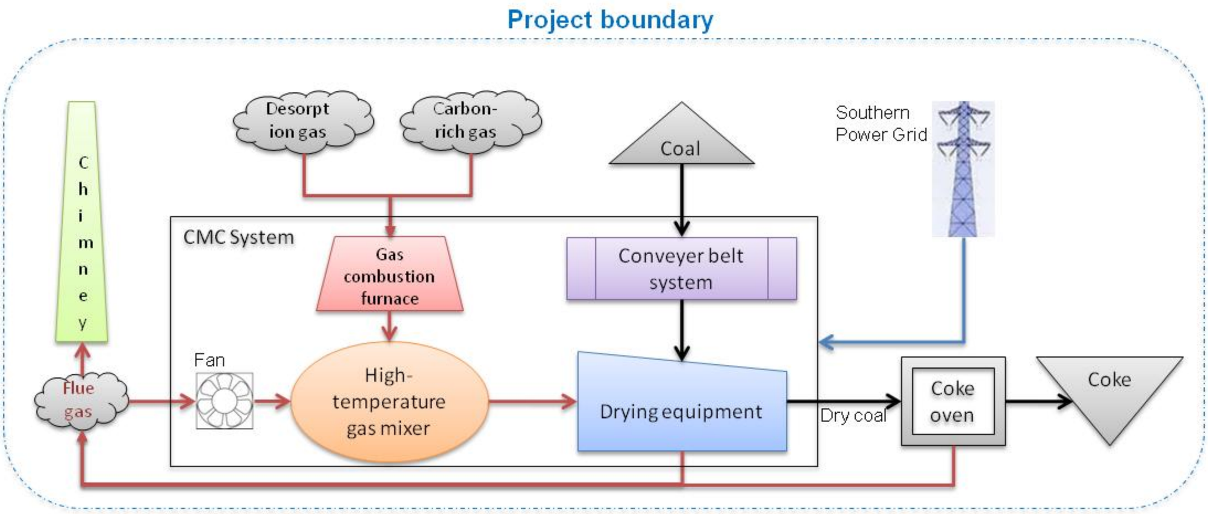

Fig. B.3 Project boundary

Table B.3 Emission sources for the proposed project activity

	Source	Gas	Included?	Justification / Explanation
Baseline	Supplemental COG fuel consumption at the coke oven	CO2	Included	Main emission source
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
	Emission from the consumptions of grid electricity	CO2	Included	Main emission source
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
Project Activities	Supplemental COG fuel consumption at the coke oven	CO2	Included	Main emission source
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
	Emission from the consumptions of grid electricity	CO2	Included	Main emission source
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.

B.4. Description of baseline and its development:

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Based on the information provided in *Appendix B of the simplified modalities and procedures for small-scale CDM activities*, that the approved Revision Baseline methodology AMS-II.D. (Version 12) is applicable to the Project. According to methodology AMS-II.D., it could be supposed the below alternative cases without the implementation of the proposed project.

Case 1. Implement the project measure without CDM benefits.

It is needed considerable amount of investment for installing the CMC equipment. In the case of the proposed project, it reaches 79millions of RMB for installing the equipment, so that the project owner would borrow 60% of the investment from a bank for its huge amount of investment. In contrast, according to the negotiation between the project owner and the bank, the bank reluctant to lend without CDM.
Moreover, the project IRR would not reach the IRR benchmark for investment project ruled by Chinese government, therefore the project would not be feasible.
For these reasons, Case 1 could be excluded.

Case 2. Continue the conventional coke production.
Another alternative is the continuation of the conventional coke production without the implementation of the proposed project. The coke produced from the 4 coke ovens in the project site satisfies the local standard[1] in Yunnan province; moreover the COG arisen from coke ovens is captured and treated through desulfurization equipment and purifying facility; the discharged water is treated at a treating facility. The existing coke production line satisfies the regulations of Chinese and Yunnan governments hence Case 2 could be realistic.
According to the above considerations, the baseline of the proposed project could be described as follows.

Description of baseline
According to methodology AMS-II.D., the baseline of the proposed project could be described as the situation where more COG is consumed in coke ovens because of higher rate of moisture in the material coal without the installation of the CMC system. The more COG is burned, the more CO2 would be emitted. Furthermore, the processes of blending and grinding additional coal with less moisture is necessary for reducing moisture in the material coal before inputting to coke ovens. Then the electricity is supplied from CSPG for operating those blending and grinding machine, therefore the electricity consumption could be also considered as the baseline.

According to methodology AMS-II.D., the baseline emissions of the electricity consumption supplied from CSPG equals to the product of the amount of electricity consumption (measured in MWh) and the emission factor of CSPG (measured in tCO_2/MWh). Then, the combined margin (CM) consisted of operating margin (OM) and build margin (BM) is determined based on the procedures prescribed in the approved “Tool to calculate the emission factor for an electricity system”.

For the detailed information, please refer to section B.6.3. and Annex 3 in this documents.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

The timelines of the proposed CDM project activity are as follows:

Table B.5.1 Timeline of the important dates of the proposed small-scale CDM project activity

Milestone	Date	Description
Feasibility Study Report Ver.1	1/2010	Completion of Feasibility Study Report Ver.1
Government approval date	25/2/2010	Qujing Industy and Information Technology Committee
EIA approval date	4/2010	Completion of EIA
Feasibility Study Report Ver.2	4/2010	Completion of Feasibility Study Report Ver.2
Government approval date	23/5/2010	Qujing Environmental Protection Bureau
Barriers for bank loan	3/6/2010	Yunnanconsidered the overall investment amount

[1] Yunnan province energy consumption quotas of main industrial products, p192

		is 79 million. under such situaion, the return is too low, so the financing is denied.
Request of CDM projects from GEC	2/7/2010	Commision for requesting proper CDM project from EES & Tepia to Yunnan Sun Valley Energy Conservation Industry Development Co., Ltd.
Cahier about CDM	7/7/2010	First consideration of CDM project by the project owner and Yunnan Sun Valley Energy Conservation Industry Development Co., Ltd.
Application for GEC with Dawei project	16/7/2010	EES & Tepia apply Dawei project for CDM project of GEC in partnership
Enter into co-benefit partnership contract between Japan & China	6/9/2010	Tepia &Yunnan Sun Valley Energy Conservation Industry Development Co., Ltd. enter into partnership contract for CDM project
Start the CDM project officially	10/9/2010	Dawei & Yunnan Sun Valley Energy Conservation Industry Development Co., Ltd. enter into partnership contract for CDM project
Board resolution	20/9/2010	Board decide to apply for CMC Project
Revise the amount of investment into 7,900 RMB	17/12/2010	Dawei applied revised amount of investment for government
Government approval date	20/12/2010	Government approved the revised amount of investment of 79 million RMB
Starting date of construction	24/12/2010	Official contract of construction
The date of purchasing main equipment	5/1/2011	Official contruct of purchasing main equipment
Project operation date	1/7/2011	Expectation

According to Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, at least one of the following categories of barriers is to be chosen for demonstrating the additionality of the proposed project:

- Investment barriers
- Technological barriers
- Barriers due to prevailing practice
- Other barriers

The additionality of the proposed project is demonstrated based on the Investment Barrier.

Investment Barrier Analysis

Option of analysis methods

This PDD argues that the project is not economically attractive without the revenues from the sale of CERs. There are, in principle, three analysis methods that can be used to demonstrate this:

- Option I: Simple cost analysis.
- Option II: Investment comparison analysis.
- Option III: Benchmark analysis.

The simple cost analysis is not applicable for the proposed project because it will produce economic benefit (from energy saving) other than CERs' income. Then the benchmark analysis is chosen.

Benchmark selection

As financial indicator for the benchmark analysis we use the IRR. The choice of the IRR is appropriate, because this indicator is routinely used for project approval decisions in China. Therefore, the benchmark analysis will use the IRR (after tax) as the prime financial indicator.

Calculation and comparison of financial indicators

According to "Construction project economic evaluation methods and parameters"[2], the financial benchmark rate of return of processing of wastes (after tax) is 12%. Therefore, we choose 12% as the economic evaluation indicators.

Table B.5.2 Main parameters for calculation of financial calculation

Items	Unit	Value	Source
Installed Capacity	t/h	375	FSR (feasibility study report)
Total Investment	Million Yuan	79.35	FSR
Current capital	Million Yuan	1.95	FSR
O&M	Million Yuan/yr	7.29	FSR
Income*	Million Yuan/yr	22.47	FSR
Value added tax	%	17%	FSR
Other taxes	%	11%	FSR, city tax plus education tax
Project life	years	15	FSR
CERs price (assumed)	€ /tCO_2	10	Assumed
Credit period	years	10	

*The "Income" refers to the cost savings of; the cost for purchasing the material coal with lower moisture and the cost of the COG saved in coke oven.

Table B.5.3 Financial internal rate of return

Scenario	IRR (after tax)
Without CDM benefit	11.07%
With CDM benefit	12.02%

From the table B.1 we can see: Without the consideration of CDM benefit, the internal rate of return is 11.07% which is lower than benchmark rate of return 12%, so the proposed project has no financial attraction. This project is unfeasible. With the consideration of CDM benefit, the internal rate of return is 12.02%, which is higher than benchmark rate of return 12%. This project is feasible. We can get the conclusion that CDM benefit can improve the financial attraction of proposed project.

<u>Sensitivity Analysis</u>

We have also conducted a sensitivity analysis to assess whether under reasonable variations in the critical assumptions, the results of the analysis remain unaltered. We have used as critical assumptions:

- Investment on construction fluctuating from -10% to +10%;
- Operation cost fluctuating from -10% to +10%;
- Coal saving fluctuating from -10% to +10%.

[2] Page 203, Table 2.13-1 Financial benchmark rate of return calculation and coordination for some industries (In Chinese).

The propose project only supply heat for the owner, there is no business income. The results of IRR (after tax) without consideration of CDM benefits can be seen from Table B.5.4 and Fig. B.1 when the parameters of fixed asset investment, O&M cost and income fluctuate in the range between +10% and -10%.

Table B.5.4 Sensitivity analysis of the proposed project.

Variation	Fixed Asset Investment	O&M Cost	Coal Saving
-10%	12.84%	11.83%	10.98%
-5%	11.92%	11.45%	11.03%
0	11.07%	11.07%	11.07%
5%	10.28%	10.68%	11.11%
10%	9.54%	10.29%	11.15%

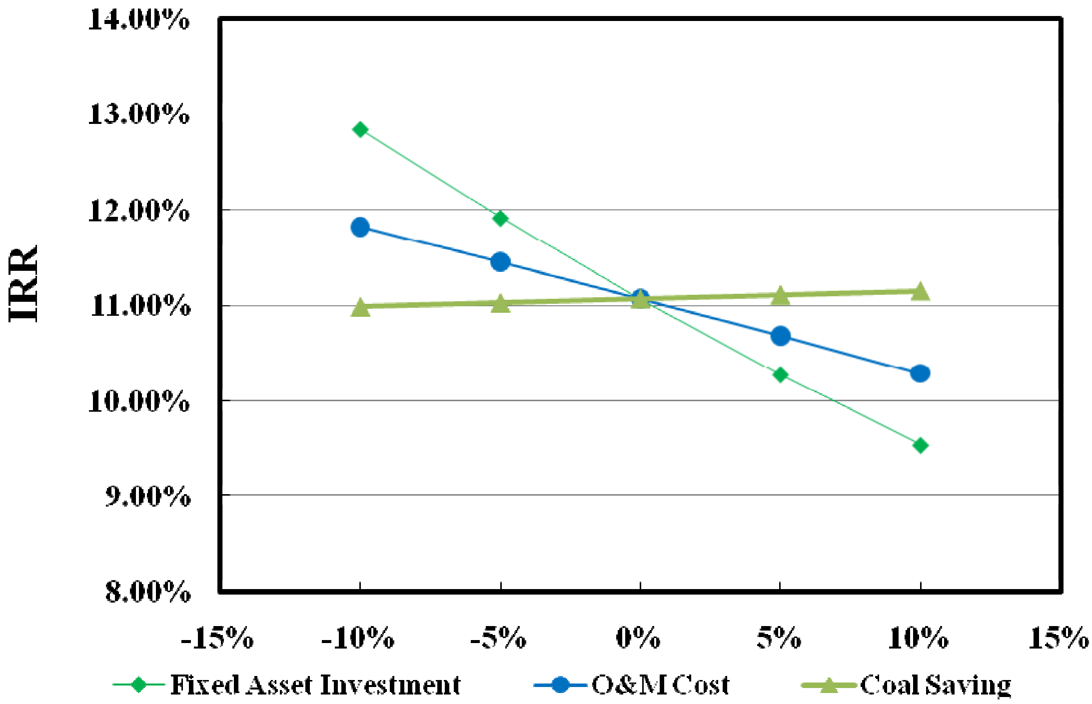

Fig. B.1 Sensitivity analysis of the proposed project.

From the above Table and Figure, only if Fixed Asset Investment is reduced 10%, IRR of the project will exceed benchmark rate 12%. IRR of the project will not exceed benchmark rate 12% no matter what O&M Cost reduce 5% or 10%. If the income from Coal Saving is raised 5% or 10%, IRR of the project will still not exceed benchmark rate 12%. Because the project is in course of construction, and the main equipment and materials have been signed contract in the current investment amount, so 10% reduction of Fixed Asset Investment is unreality.

Based on the above analysis, the proposed project has no financial attraction without CDM benefits; hence the implementation of the proposed project is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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As per the methodology (AMS II.D i.e. "Type II – Energy efficiency improvement projects of Category II.D – Energy efficiency and fuel switching measures for industrial facilities" Version 12), emission reduction of the proposed project is calculated from baseline emission, project emission and the leakage emission as follows.

1.Baseline emission calculation

$$BE_y = BE_{Heat,y} + BE_{Elec,y} \quad (1)$$

Where

BE_y	Baseline emission in the y year (tCO2e/y)
$BE_{Heat,y}$	Baseline emission due to the consumption of COG in the y year (tCO2e/y)
$BE_{Elec,y}$	Baseline emission due to the consumption of electricity in the y year (tCO2e/y)

$$BE_{Heat,\ y} = BC_y \times (1 - WC_{CMC\ IN}) \times WC_{CMC\ IN} \div 1\% \times HW_{Coal} \times VC_{COG} \div 1000 \quad (2)$$

Where

BC_y	Baseline material coal input(t/yr)
$WC_{CMC\ IN}$	Material coal moisture before CMC system (%)
HW_{Coal}	Calorific value for reducing 1% of moisture in the material coal(MJ/t)
VC_{COG}	CO2 emission after combustion of unit COG($kgCO_2$/TJCOG)

$$BC_y = BK_y \times BF_{coke} \quad (3)$$

Where

BK_y	Baseline coke production(t/y)
BF_{coke}	Baseline production efficiency

$$BF_{coke} = BRC_y \div BRK_y \quad (4)$$

Where

BRC_y	Actual coal usage amount(t/y)(t/y)
BRK_y	Actual coke production quantity(t/y)(t/y)

$$BE_{Elec,\ y} = (EC_{Bl,y} \times EF_{Elec}) \quad (5)$$

Where

$EC_{Bl,y}$	Baseline consumption of electricity (MWh/y)
EF_{Elec}	Emission factor of CSPG (China Southern Power Grid, tCO2e /MWh/y)

According to *"Tool to calculate the emission factor for an electricity system" (ver.2)*, it is calculated in detail on the following steps of the baseline CO_2 emission factor of the grid which is connected with the proposed project.

Step 1. Identify the relevant electricity systems

According to the delineation of China DNA, Yunnan province is covered with the area of CSPG, therefore the relevant electric power system of the proposed project activity is identified as CSPG.

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

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. Because the data of off-grid power plants is unavailable, option I is chosen.

Because the data of off-grid power plants is unavailable, option I is chosen.

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

According to the Tool, four alternatives could be used to calculate the OM:

(a) Simple OM

(b) Simple adjusted OM, or

(c) Dispatch Data Analysis OM, or

(d) Average OM.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

- 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 the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period, or

- Ex post option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year y is usually only available later than six months after the end of year y, alternatively the emission factor of the previous year (y-1) may be used. If the data is usually only available 18 months after the end of year y, the emission factor of the year proceeding the previous year (y-2) may be used. The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods.

For the proposed project, the simple OM (a) emission factor was chosen based on the following three reasons:

1. **Dispatch data analysis (c) is not applicable**. In China, the State Grid Corporation runs the interregional dispatch system and each regional grid corporation run the intraregional dispatch system. The dispatch information is regarded as business secrets and not available to the public.

2. **The simple-adjusted OM (b) is not applicable**. The data of load curve are not available as well as the reason of dispatch data analysis(c).

3. **Average OM (d) is not applicable**. During the most recent 5 years (2003-2007), the low-cost/must-run resources of CSPG constitute less than 50% of total grid generation: 34.66%, 31.58%, 30.69%, 29.75% and 29.95% in 2003, 2004, 2005, 2006 and 2007 respectively.

As a result, the only simple OM (a) method can be applicable. Besides, Ex ante option is used for this CDM-PDD, therefore it is not required to be monitored and recalculated during the crediting period.

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

<u>(a) Simple OM</u>

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant / unit[4] (Option A), or
- Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or
- Based on data 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 C)

As stated in the Tool, Option A should be preferred and must be used if fuel consumption data is available for each power plant/unit. However, Option C is adapted in this PDD as all the relvent data necessary for Option A are not currently available in China. Accordingly, only nuclear and renewable power generation are considered as low-cost/must run power sources and data for the quantity of electricity supplied to the grid by these sources are available.

Where Option C is used, 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:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y} \qquad (6)$$

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 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)
i	All fossil fuel types combusted in power sources in the project electricity system 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 2

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[5] to the grid. Electricity imports should be treated as one power plant m.

The Chinese DNA published the latest $EF_{OM,y}$ of CSPG will of be adopted in this PDD and its value is 0.9987(tCO_2/MWh) and the detail calculation is shown as Annex 3.

Step 5. Identify the group 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 PDD 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.

As for vintage of data, Option 1 is selected.

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.

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:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad (7)$$

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

Because some data are not available, the BM calculation in this PDD adopts the deviation method agreed by the CDM EB[3].

Firstly, calculate the new installed capacity and its power generation technology mix. Secondly, calculate the weights of new capacity in each generation technology. and finally, calculate the BM emission factor at the commercialized best efficiency performance of each generation technology.

Because the installed capacity of the coal-fired, oil-fired and gas-fired technology can not be extracted directly from the existing statistical data, the BM calculation in this PDD adopts the following method: First, use the available data in the energy balance sheets on the most recent year to calculate the share of CO_2 emissions from solid, liquid and gaseous fuels corresponding to the total emissions of CO_2 emissions. Second, use the proportions as the weights, based on the emission factors at the commercialized best efficiency performance of each generation technology, calculate the emission factor of the thermal power in grid. Thirdly, this thermal emission factor is multiplied by the proportion of thermal power in the new 20% capacity. Finally the BM emission factor is got.

The detail calculation steps are as follows:

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

$$\lambda_{COAL,y} = \frac{\sum_{i \in COAL, j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}} \quad (8)$$

$$\lambda_{Oil,y} = \frac{\sum_{i \in OIL, j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}} \quad (9)$$

$$\lambda_{Gas,y} = \frac{\sum_{i \in GAS, j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,j} \times EF_{CO2,i,j,y}} \quad (10)$$

Where:

$F_{i,j,y}$	the amount of fuel i consumed by province j in year(s) y;
$NCV_{i,y}$	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)

Coal, Oil and *Gas* refer to the solid, liquid and gaseous fuel.

Step (2): Calculation the emission factor of thermal power.

$$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal,Adv} + \lambda_{Oil} \times EF_{Oil,Adv} + \lambda_{Gas} \times EF_{Gas,Adv} \quad (11)$$

$EF_{Coal,Adv}$、$EF_{Oil,Adv}$、$E_{FGas,Adv}$ represent the emission factors of the best efficient and commercial coal-fired, oil-fuel and gas-fuel generation technologies.

[3] http://cdm.unfccc.int/Projects/Deviations/index.html

Step (3): Calculation BM in the grid.

$$EF_{BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal} \quad (12)$$

Where:

CAP_{Total}	The total added installed capacity
$CAP_{Thermal}$	The total added installed capacity for thermal power

Same as the OM, The Chinese DNA published the lastest $EF_{BM,y}$ of CSPG, and it will be adopted in this PDD and its value is 0.5772(tCO_2/MWh) and the detail calculation is shown as Annex 3.

Step 7. Calculate the combined margin emissions factor

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad (13)$$

Where:

$EF_{grid,BM,y}$	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 methodology which refers to this tool.

Therefore, for the proposed project w_{OM} = 0.5 and w_{BM} = 0.5 is chosen. Then CO_2 emission factor for CSPG $EF_{Elec,gr,j,y}$ is 0.78795(tCO_2/MWh).

<u>2.Project emission calculation</u>

$$PE_y = PE_{Heat,y} + PE_{Elec,y} \quad (14)$$

Where

PE_y	Project emission in the y year (tCO2e)
$PE_{Heat,y}$	Project emission from COG in the y year (tCO2e)
$PE_{Elec,y}$	Project emission due to the consumption of electric in the y year (tCO2e)

$$PE_{Heat,y} = PC_y \times (1 - WC_{PJ}) \times WC_{PJ} \div 1\% \times HW_{coal} \times VC_{COG} \div 1000 \quad (15)$$

Where

PC_y	Project material coal input after CMC system(t/yr)
WC_{PJ}	Material coal moisture after CMC system (%)
HW_{coal}	Calorific value for reducing 1% of moisture in the material coal(MJ/t)
VC_{COG}	CO2 emission after combustion of unit COG($kgCO_2$/TJCOG)

$$PC_y = BK_y \times PF_{coke} \quad (16)$$

Where

BK_y	Baseline coke production(t/y)
PF_{coke}	Project production efficiency

$$PF_{coke} = PRC_y \div PRK_y \quad (17)$$

Where

PRC_y	Actual coal usage amount(t/y)
PRK_y	Actual coke production quantity(t/y)

$$PE_{Elec,\,y} = (EC_{PJ,y} \times EF_{Elec}) \quad (18)$$

Where

$FC_{PJ,y}$	Project consumption of electric (MWh)
EF_{Elec}	Emission factor of CSPG (China Southern Power Grid, tCO2e /MWh)

3.Leakage calculation

The proposed project will not transfer equipment from other places and will also not transfer equipment to other places, so there is no leakage.

LE_y=0

Where

LE_y	Leakage of the proposed project in the y year (tCO2e)

4.Emission reduction calculation

The emission reduction is calculated as follows:

$$ER_y = BE_y - PE_y - LE_y = BE_y - PE_y \quad (19)$$

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	BRC_y
Data unit:	t/yr
Description:	Actual coal usage amount(t/y)
Source of data used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	2,496,197
Justification of the choice of data or description of measurement methods and procedures actually applied :	2008,2009 Historical records
Any comment:	

Data / Parameter:	BRK_y
Data unit:	t/yr
Description:	Actual coke production quantity(t/y)
Source of data used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	1,914,545
Justification of the choice of data or description of measurement methods and procedures actually applied :	2008,2009 Historical records
Any comment:	

Data / Parameter:	BF_{coke}
Data unit:	t/yr
Description:	Baseline coke production efficiency
Source of data used:	Calculated from Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	1.30
Justification of the choice of data or description of measurement methods and procedures actually applied :	$BRC_y \div BRK_y$
Any comment:	

Data / Parameter:	BK_y
Data unit:	t/yr
Description:	Baseline coke production
Source of data used:	Production equipment capability of Yunnan Dawei Coking Co., Ltd.
Value applied:	2,000,000
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	BC_y
Data unit:	t/yr
Description:	Baseline coal input
Source of data used:	The amount of coal to produce 2 million tons coke
Value applied:	2,607,613
Justification of the choice of data or description of measurement methods	$BK_y \times BF_{coke}$

and procedures actually applied :	
Any comment:	

Data / Parameter:	$WC_{CMC\ IN}$
Data unit:	%
Description:	Material coal moisture before CMC system
Source of data used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	12.09
Justification of the choice of data or description of measurement methods and procedures actually applied :	2008,2009,2010 Historical records
Any comment:	The average of the historical records of Yunnan Dawei Coking Co., Ltd.

Data / Parameter:	WC_{PJ}
Data unit:	%
Description:	Material coal moisture after CMC system
Source of data used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	10
Justification of the choice of data or description of measurement methods and procedures actually applied :	FSR
Any comment:	

Data / Parameter:	HW_{coal}
Data unit:	MJ/t
Description:	Calorific value for reducing 1% of moisture in the material coal
Source of data used:	Chinese national standard, GB 50432-2007, “Code for design of coking technology”
Value applied:	58
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	VC_{COG}

Data unit:	Kg/TJ
Description:	CO2 emission after combustion of unit COG
Source of data used:	IPCC2006
Value applied:	44,400
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$EC_{BL,y}$
Data unit:	MWh
Description:	Baseline electricity consumption
Source of data used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value applied:	1,759
Justification of the choice of data or description of measurement methods and procedures actually applied :	320kW×5497h(2009 Historical records)
Any comment:	

Data / Parameter:	$EC_{PJ,y}$
Data unit:	MWh
Description:	Project electricity consumption
Source of data used:	FSR
Value applied:	7,675
Justification of the choice of data or description of measurement methods and procedures actually applied :	(FSR; 1.07 MWh * 7,200 h)
Any comment:	

Data / Parameter:	EF_{Elec}
Data unit:	tCO2e /MWh/y
Description:	Emission factor of China Southern Power Grid
Source of data used:	NDRC
Value applied:	0.78795
Justification of the choice of data or description of	

measurement methods and procedures actually applied :	
Any comment:	http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2413.pdf

B.6.3 Ex-ante calculation of emission reductions:

>>

Baseline emission calculation

The baseline emission of CO2 is determined from the two sources; one is the emission for burning COG in coke ovens, the other is the emission for generating electricity purchased from CSPG for operating blending and grinding machine. The amount of baseline emission of CO2 is calculated based on B.6.1 and B.6.2 as follows;

BE_y = $(BC_y \times (1 - WC_{CMC\ IN}) \times WC_{CMC\ IN} \div 1\% \times HW_{Coal} \times VC_{COG}) + (EC_{Bl,y} \times EF_{Elec})$

= (2,607,613t×(1－12.09%) ×12.09%÷1%×58MJ/t÷1,000,000TJ/MJ×44,400kgCO_2/TJ÷1,000kg/t) ＋(1,759MWh/y×0.78795 tCO2e /MWh/y)

=72,757 tCO_2/year

Table B6.1 Data of Baseline Emission

	Value	Data unit
Baseline emission due to the consumption of heat in the y year	71,370	tCO_2/ year
Baseline emission due to the consumption of electric in the y year	1,386	tCO_2/ year
Total Baseline emission	72,757	tCO_2/year

Project emission

The project emission of CO2 is determined from the two sources; one is the emission for burning COG in coke ovens, the other is the emission for generating electricity purchased from CSPG for operating CMC equipment. The amount of baseline emission of CO2 is calculated based on B.6.1 and B.6.2 as follows;

For ex-ante calculation, Project material coal input after CMC system (PC_y) is estimated based on 1) the expected enhancement of coke production as 67,000 t/y(FSR) and 2) historical coal input as 2,496,157 t/y and 3) historical coke production as 1,914,545 t/y ;

PC_y = $BK_y \times PF_{coke} = BK_y * (PRC_y / PRK_y)$

= $BK_y * (BRC_y / (BRK_y + 67{,}000))$

= 2,000,000 * (2,496,197 / (1,914,545 + 67,000))

= 2,519,445t

PE_y = $(PC_y \times (1 - WC_{PJ}) \times WC_{PJ} \div 1\% \times HW_{coal} \times VC_{COG}) + (EC_{PJ,y} \times EF_{Elec})$

= (2,519,445t×(1－10%) ×10%÷1%×58MJ/t÷1,000,000TJ/MJ×44,400kgCO_2/TJ÷1,000kg/t)＋(7,675MWh/y×0.78795 tCO2e /MWh/y)

=64,440tCO_2/year

Table B6.2 Data of Project Emission

	Value	Data unit
Project emission due to the consumption of heat in the y year	58,393	tCO_2/ year
Project emission due to the consumption of electric in the y year	6,048	tCO_2/ year
Total Project emission	64,440	tCO_2/year

Leakage

The proposed project will not transfer equipment from other places and will also not transfer equipment to other places, so there is no leakage.

$LE_y = 0$

Emission reduction

According to B.6.1 and the result of above calculations,, the emission reduction is calculated as follows:

$ER_y = BE_y - PE_y - LE_y$
$= 72{,}757 tCO_2/ year - 64{,}440\ tCO_2/ year - 0$
$= 8{,}316\ tCO_2/year$

Table B6.3 Data of Emission reduction

	Value	Data unit
Total Baseline emission, BE_y	72,757	tCO_2/ year
Total Project emission, PE_y	64,440	tCO_2/ year
Emission reduction, ER_y	8,316	tCO_2/year

B.6.4 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)
2011/7/1~2011/12/31	32,220	36,378	0	4,158
2012	64,440	72,757	0	8,316
2013	64,440	72,757	0	8,316
2014	64,440	72,757	0	8,316
2015	64,440	72,757	0	8,316
2016	64,440	72,757	0	8,316
2017	64,440	72,757	0	8,316
2018	64,440	72,757	0	8,316
2019	64,440	72,757	0	8,316
2020	64,440	72,757	0	8,316
2021/1/1~2021/6/30	32,220	36,378	0	4,158
Total (tonnes of CO_2 e)	644,400	727,570	0	83,160

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

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	PRC_y
Data unit:	t/yr
Description:	Actual coal usage amount(t/y)
Source of data to be used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value of data	-
Description of measurement methods and procedures to be applied:	Monitoring data
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	PRK_y
Data unit:	t/yr
Description:	Actual coke production quantity(t/y)
Source of data to be used:	Historical records of Yunnan Dawei Coking Co., Ltd.
Value of data	-
Description of measurement methods and procedures to be applied:	Monitoring data
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	PF_{coke}
Data unit:	t/yr
Description:	Project coke production efficiency
Source of data to be used:	Calculated from Historical records of Yunnan Dawei Coking Co., Ltd.
Value of data	-
Description of measurement methods and procedures to be applied:	$PRC_y \div PRK_y$
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	PC_y
Data unit:	t/yr
Description:	Project coal input
Source of data to be used:	Calculated from Historical records of Yunnan Dawei Coking Co., Ltd. for the amount of coal to produce 2 million tons coke
Value of data	-
Description of measurement methods and procedures to be applied:	$BK_y \times PF_{coke}$
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	$WC_{CMC\ IN}$
Data unit:	%
Description:	Material coal moisture before CMC system
Source of data to be used:	Project proponents
Value of data	-
Description of measurement methods and procedures to be applied:	Monitoring data
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	WC_{PJ}
Data unit:	%
Description:	Material coal moisture after CMC system
Source of data to be used:	Project proponents
Value of data	-
Description of measurement methods and procedures to be applied:	Monitoring data
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

Data / Parameter:	$EC_{PJ,\ y}$
Data unit:	MWh/y
Description:	Project electricity consumption
Source of data to be used:	Project proponents

Value of data	-
Description of measurement methods and procedures to be applied:	Monitoring data
QA/QC procedures to be applied:	
Any comment:	Data will be archived electronically during project plus 3 years

B.7.2 Description of the monitoring plan:

>>

Monitoring Methodology

The monitoring method of the proposed project is based on AMSII.D (ver.12).
In the methodology, there is no specific instruction on the monitoring parameters but shall consist of:

(a) Documenting the specifications of the equipment replaced;
(b) Metering the energy use of the industrial or mining and mineral production facility, process or the equipment affected by the project activity;
(c) Calculating the energy saving using the metered energy obtained from sub-paragraph(b).

According to above, the monitoring data of the proposed project determined as follows.

1) Monitor Data

PRC_y (t/yr) Material coal input, measured before input to coke ovens
PRK_y (t/yr) Project coke production
$WC_{CMC\ IN}$ (%) Material coal moisture before CMC system, measured by sampling
WC_{PJ} (%) Material coal moisture after CMC system, measured by sampling
$EC_{PJ\ y}$ (MWh/y) Electricity consumption of CMC system, measured by the meter
All data collected as part of the monitoring plan should be archived electronically and be kept at least for 3 years after the end of the last crediting period.

2) Monitor operational and management scheme

The project operator plans to appoint a CDM project director and a monitoring manager and several monitoring engineers. The respective responsibilities are as follows：

CDM Project Director：Receive reports from the monitoring manager; manage the CDM project; coordinate with the Chinese Government and stakeholders; submit the monitoring report to the DOE and deliver the CERs.

Monitoring Manager: Check the monitoring data supplied by monitoring workers, aggregate yearly, prepare the monitoring report, and be responsible for CDM Project Director.

Monitoring Workers: Record the consumption of heat. Record the temperature of hot flue gas and the normal temperature every day. Archiving all of data.

The team members named in the above may be revised in the future.

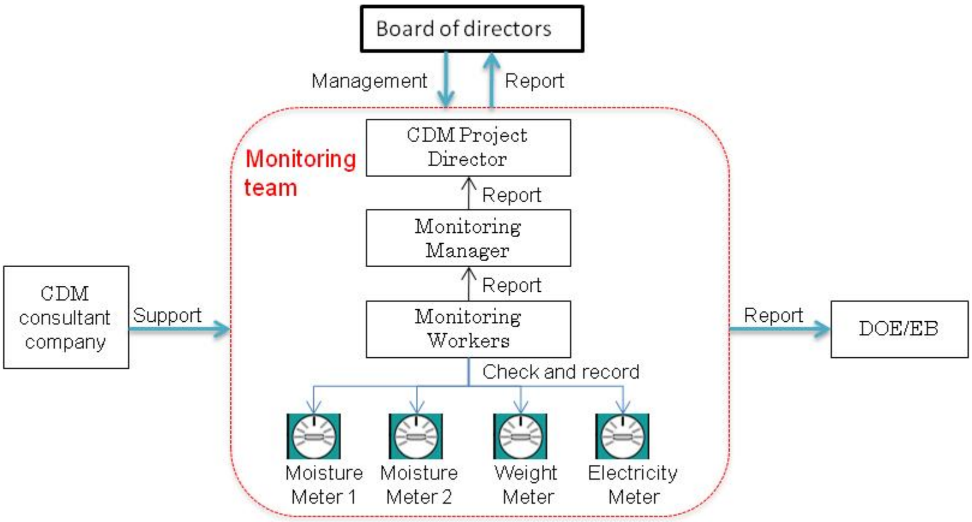

Fig. B.7.1 Operational and Management Scheme

3) Monitoring report prepared

Monitoring report is compiled by monitoring manager and is submitted to the relevant agencies by CDM project director.

4) Monitoring data archive

All monitoring data will be recorded and stored in a paper (hard copy) archives, and in parallel electronic record will be created for the archives. The relevant data will be kept during the crediting period and for two years after.

5) Recording Frequency

Data	Recording Frequency
PRC_y (t/yr)	monitoring by instrument; manual record; recording usage amount everyday; analysis of statistical data every month
PRK_y (t/yr)	monitoring by instrument; manual record; recording production quantity everyday; analysis of statistical data every month
$WC_{CMC\ IN}$ (%)	monitoring by instrument in real time; recording amount of water in real time; analysis of statistical data every month
WC_{PJ} (%)	monitoring by instrument in real time; recording amount of water in real time; analysis of statistical data every month
$EC_{PJ\ y}$ (MWh/y)	monitoring by ammeter; recording power consumption in real time; analysis of statistical data every month

6) QA/QC

All data will be digitally monitored by high accuracy instrument and meter, and be exactly saved by electronic and electronic recording through hard and soft copy.

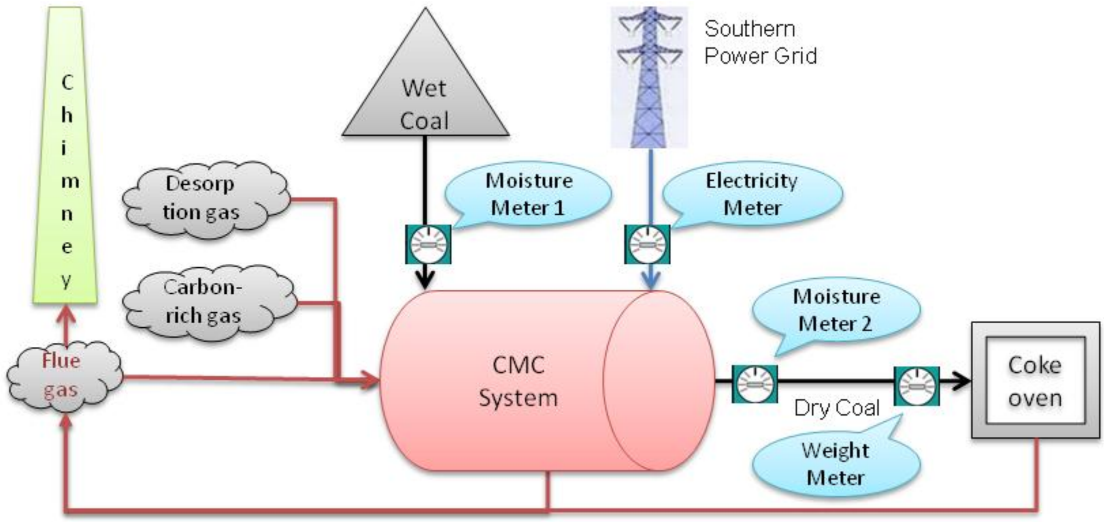

Fig. B.7.2 Monitoring point

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

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Date of completion: 30/11/2010, Name of the responsible person(s)/entity

Name	Company	Department
Tomohiko IKE	E & E Solutions Inc.	Environment Division, GHG and Energy Solution Group
Keiji NIIJIMA	E & E Solutions Inc.	Environment Division, GHG and Energy Solution Group
Masayuki SUZUKI	E & E Solutions Inc.	Environment Division, GHG and Energy Solution Group

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

1/7/2011

C.1.2. Expected operational lifetime of the project activity:

>>

15 years.

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

C.2.1. Renewable crediting period

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

>>

Not applicable

C.2.1.2. Length of the first crediting period:

>>
Not applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
1/7/2011

C.2.2.2. Length:

>>
10 years.

SECTION D. Environmental impacts

>>

D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>
The Environmental Impact Assessment has been done for the proposed project and approved by Qujing Environmental Protection Bureau on 23/5/2010. The environmental impacts arising from the Project are analyzed and get the conclusions in the following:

1. Air impact analysis

✓ Smut caused through delivery system

Band conveyors are usually used in delivery system of coal. When delivering small coal, because of the small size, smut will be caused easily. Therefore, delivery system-band conveyors will be set up with protective covering, each reloading point of band conveyors will be obdurate in order to preventing smut leak. Meanwhile the delivery coal of the project contain moisture, this is why smut caused through delivery system will not destroy environment.

✓ Flue gases caused during drying project

To remove smut caused during drying project, mechanical dust abatement will be implemented twice. Flue gases caused during drying project will be absorbed by dust abatement-machine by 50% once a time through inertia and speed droop. In addition to hop-pocket dust abatement (99.9% efficiency), flue gases will be discharged to atmosphere through exhaust funnel after twice filter. Waste gas will be discharged to atmosphere after dust abatement, therefore it is little damage to the environment.

2. Analysis of water environment influence

Water will not be used in the course of the project production, and no factory effluent will be discharged. Therefore there is no environmental influence.

3. Analysis of solid waste influence

Solid wastes caused from the project are mainly waste filter pockets and waste coal. Waste filter pockets will be 0.5 ton yearly, which will be collected and delivered to Zhanyi county incineration power plant. Coal dust collected during drying project will be delivered to coal blending system by band conveyors to reuse. Therefore t is little damage to the environment.

4. Analysis of acoustical environment influence

The noise of the project is caused mainly from drying rollers, high-heat draft fans and air-blowers etc., which is mostly mechanical noise and aerodynamic noise. The intensity of noise origin is between 85-95dB(A). To common factory, when well closure of doors and windows, defining effect will be 15-20dB(A). Therefore the intensity of noise is between 70-75dB(A) outside of the factory, and will weaken to 15 dB(A) from 20m outside of the factory because of range attenuation and green area.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

The project is the typical energy-saving and emission-reduction project, which can not only reduce CO2 emission, but also can reduce air pollutant like SO2 emission. Meanwhile, the implement of the project can reduce coke-oven effluent. Therefore the project will not bring negative effect on environment, instead the project will protect environment through environmental investment.

SECTION E. Stakeholders' comments

>>

E.1. Brief description how comments by local stakeholders have been invited and compiled:

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The questionnaire survey activity was carried out by the Yunnan Sun Valley Energy Conservation Industry Development Co., Ltd and Yunnan Dawei Coking Co., Ltd. during October 1, 2010 and October 30, 2010, covering the area of 30 km around the project site, including municipal government, public institute, farmers, state-owned and private enterprises. Total numbers of delivered questionnaire are 50 and among them 50 were collected.

Questionnaire was made easy to answer, such as the comments on the economy and environment impact, project information, CDM project knowledge, etc.

E.2. Summary of the comments received:

>>

Item	Option	Respondents	%
1. Do you know about the CMC CDM project of Yunnan Dawei Coking Co., Ltd..?	a. Know	35	70%
	b. Know, but a little	9	18%
	c. Unknown	6	12%
2. If you chose *a* or *b* in question 1, please answer: by what media did you hear about the CMC CDM project.	a. TV, newspaper, radio	5	12%
	b. Internet	4	9%
	c. Project introduction meeting	13	30%
	d. Others	21	49%
3. Do you know about the CMC technique?	a. Know	22	44%
	b. Know, but a little	14	28%
	c. Unknown	14	28%
4. What do you think about the impact of CMC technique on local environment?	a. Active	34	68%
	b. No opinion	16	32%
	c. Negative	0	0%

5. If you chose *a* or *b* in question 4, please answer: what kind of active impact will the CMC technique bring on?(Multiple choice)	a. Reduce waste gas emission	25	51%
	b. Reduce waste water emission	22	45%
	c. Reduce waste sludge emission	10	20%
	d. Others	0	0%
6. If you chose *c* in question 4, please answer: what kind of negative impact will the CMC technique bring on?(Multiple choice)	a. Air pollution		
	b. Water pollution		
	c. Sludge pollution		
	d. Noise pollution		
	e. Others		
7. Do you think the CMC technique benefits local economical development?	a. Benefit	38	76%
	b. No opinion	10	20%
	c. Not benefit	1	2%
8. Do you think whether the CMC technique should be extended or not?	a. Yes	40	80%
	b. No opinion	8	16%
	c. No	1	2%
9. Do you agree to the CMC CDM project of Yunnan Dawei Coking Co., Ltd.?	a. Yes	42	84%
	b. No opinion	6	12%
	c. No	1	2%
10. If you have any other comments on the proposed CDM project, please write in detail.	N/A		

E.3. Report on how due account was taken of any comments received:

>>

No any modifications is necessary for the project planning due to the comments received since most of responses support the construction and implementation of the project without any amendment of the mentioning in full or partial.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Yunnan Dawei Coking Co., Ltd.
Street/P.O.Box:	
Building:	Huashan industrial park
City:	Qujing City
State/Region:	Yunnan province
Postfix/ZIP:	655338
Country:	People's Republic of China
Telephone:	+86-874-3032288
FAX:	
E-Mail:	
URL:	http://www.ywgrp.com/about/content.aspx?id=115&stype=4
Represented by:	
Title:	Section chief
Salutation:	
Last Name:	Dexu
Middle Name:	
First Name:	Kong
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public fund from Annex I Party is involved in this project.

Annex 3

BASELINE INFORMATION

Following table shows the amounts of historical coal input, input coal moisture and coke production according to the records of Yunnan Dawei Coking Co., Ltd.

year	Historical coal input(t/y)	Historical input coal moisture(%)	Historical coke production(t/y)	Historical electricity consumption(MWh/y)
2008	2,448,181	11.96	1,873,069	-
2009	2,544,212	11.99	1,956,021	1,759
2010	-	12.31	-	-

Please refer to annex 1 of the "*Bulletin on the Baseline Emission Factors of the China's Regional Grids*" reviewed by Director Office of National Climate Change Coordination of National Development and Reform Commission of China (the DNA for CDM in China) on 2,Jul,2009.

Table A1.1 Power generation from fuel-fired power of CSPG in 2005

	Power generation (10^8kWh)	Power generation (MWh)	Internal consumption rater (%)	Power supply to grid (MWh)
GuangDong	1764.53	176,453,000	5.58	166,606,923
GuangXi	250.23	25,023,000	7.95	23,033,672
GuiZhou	584.3	58,430,000	6.94	54,141,238
YunNan	272.81	27,281,000	7.34	25,387,699
Total				269,169,531

Data resource：2006 China electric power yearbook

Table A1.2 Simple OM calculation sheet of CSPG in 2005

Fuel sort	unit	Guangdong	Guangxi	Guizhou	Yunnan	subtotal	Emission factor (tc/TJ)	Oxidation rate (%)	Emission factor (kgCO2/TJ)	Average caloric value (MJ/t,km³)	Emission of CO_2(tCO_2e) J=E×H×I/100000(quality)
		A	B	C	D	E=A+B+C+D	F	G	H	I	J=E×H×I/10000 (volume)
Raw coal		6696.47	1435	3212.31	1975.5	**13319.33**	25.8	100	87,300	20,908	243,113,522
Wash extractive coal	10^4 ton				0.15	**0.15**	25.8	100	87,300	26,344	3,450
Other wash coal				10.39	33.88	**44.27**	25.8	100	87,300	8,363	323,211
Coke		4.79			8.05	**12.84**	29.2	100	95,700	28,435	349,406
Coke oven gas	10^8 m^3				0.79	**0.79**	12.1	100	37,300	16,726	49,287
Other coal gas		1.87			15.96	**17.83**	12.1	100	37,300	5,227	347,626
Crude oil		10.91				**10.91**	20	100	71,100	41,816	324,367
Gasoline		0.68				**0.68**	18.9	100	67,500	43,070	19,769
Diesel oil	10^4 ton	31.96	2.02		1.81	**35.79**	20.2	100	72,600	42,652	1,108,250
Fuel oil		887.21				**887.21**	21.1	100	75,500	41,816	28,010,178
LPG						**0**	17.2	100	61,600	50,179	0
Refine dry gas		4.92				**4.92**	15.7	100	48,200	46,055	109,217
Nature gas	10^8 m^3	0.93				**0.93**	15.3	100	54,300	38,931	196,598
Other oil production	10^4 ton	1.7				**1.7**	20	100	75,500	41,816	53,671
Other coke production						**0**	25.8	100	95,700	28,435	0
Other energy	10^4 tce	104.66	133.15		59.72	**297.53**	0	0	0	0	0
Total											274,008,550
Net import electricity from CCPG									20,264,000		
Average emission rate of CCPG in 2005									1.16148		
Total emission of CO_2 from CSPG in 2005									**297,544,857**		
Total Power supply of CO_2 from CSPG in 2005									**289,433,531**		
2005 Emission factor of CSPG									**1.02802**		

Data source: *2006 China Energy Statistics Yearbook*

Table A1.3 Power generation from fuel-fired power of CSPG in 2006

	Power generation (10^8kWh)	Power generation (MWh)	Internal consumption rater (%)	Power supply to grid (MWh)
GuangDong	1884.29	188,429,000	5.27	178,498,792
GuangXi	279.67	27,967,000	4.45	26,722,469
GuiZhou	760.39	76,039,000	6.06	71,431,037
YunNan	397.91	39,791,000	4.12	38,151,611
Total				314,803,908

Data resource：2007 China electric power yearbook

Table A1.4 Simple OM calculation sheet of CSPG in 2006

Fuel sort	unit	Guangdong	Guangxi	Guizhou	Yunnan	subtotal	Emission factor	Oxidation rate	Emission factor	Average caloric value	Emission of CO_2(tCO_2e)
							(tc/TJ)	(%)	(kgCO2/TJ)	(MJ/t,km³)	J=E×H×I/100000(quality)
		A	B	C	D	E=A+B+C+D	F	G	H	I	J=E×H×I/10000 (volume)
Raw coal	10^4 ton	7303.19	1490.01	4001.54	2735.8	**15530.62**	25.8	100	87,300	20,908	283,475,499
Wash extractive coal						**0**	25.8	100	87,300	26,344	0
Other wash coal				19.53	45.8	**65.33**	25.8	100	87,300	8,363	476,968
Briquette coal		133.75				**133.75**	26.6	100	87,300	20,908	2,441,296
Coke					1.31	**1.31**	29.2	100	95,700	28,435	35,648
Coke oven gas	10^8 m³		0.84		2.06	**2.9**	12.1	100	37,300	16,726	180,925
Other coal gas		0.89			19.15	**20.04**	12.1	100	37,300	5,227	390,714
Crude oil	10^4 ton	0.87				**0.87**	20	100	71,100	41,816	25,866
Gasoline						**0**	18.9	100	67,500	43,070	0
Diesel oil		29.92	1.26		3	**34.18**	20.2	100	72,600	42,652	1,058,396
Fuel oil		685.85	0.09			**685.94**	21.1	100	75,500	41,816	21,655,867
LPG						**0**	17.2	100	61,600	50,179	0
Refine dry gas						**0**	15.7	100	48,200	46,055	0
Nature gas	10^8 m³	7.92				**7.92**	15.3	100	54,300	38,931	1,674,251
Other oil production	10^4 ton	0.67				**0.67**	20	100	75,500	41,816	21,153
Other coke production						**0**	25.8	100	95,700	28,435	0
Other energy	10^4 tce	93.54	189.68		20.29	**303.51**	0	0	0	0	0
Total											311,436,583
Net import electricity from CCPG									21,730,840		
Average emission rate of CCPG in 2006									1.12157		
Total emission of CO_2 from CSPG in 2006									**335,809,186**		
Total Power supply of CO_2 from CSPG in 2006									**336,534,748**		
2006 Emission factor of CSPG									**0.99784**		

Data source: *2007 China Energy Statistics Yearbook*

Table A1.5 Power generation from fuel-fired power of CSPG in 2007

	Power generation (10^8kWh)	Power generation (MWh)	Internal consumption rater (%)	Power supply to grid (MWh)
GuangDong	2157	215,700,000	6.01	202,736,430
GuangXi	361	36,100,000	7.42	33,421,380
GuiZhou	843	84,300,000	6.62	78,719,340
YunNan	474	47,400,000	7.23	43,972,980
Total				358,850,130

Data resource：2008 China electric power yearbook

Table A1.6 Simple OM calculation sheet of CSPG in 2007

Fuel sort	unit	Guangdong	Guangxi	Guizhou	Yunnan	subtotal	Emission factor	Oxidation rate	Emission factor	Average caloric value	Emission of CO_2(tCO_2e)
							(tc/TJ)	(%)	(kgCO2/TJ)	(MJ/t,km^3)	J=E×H×I/100000(quality)
		A	B	C	D	E=A+B+C+D	F	G	H	I	J=E×H×I/10000 (volume)
Raw coal		8214.78	1750.63	4298.8	3170.7	**17435**	25.8	100	87,300	20,908	318,235,546
Wash extractive coal		3.46				**3.46**	25.8	100	87,300	26,344	79,574
Other wash coal	10^4 ton		0.65	21.58	14.64	**36.87**	25.8	100	87,300	8,363	269,184
Briquette coal		271.25				**271.25**	26.6	100	87,300	20,908	4,951,041
Coke		0.04	1.69		2.15	**3.88**	29.2	100	95,700	28,435	105,584
Coke oven gas	10^8 m^3		0.96	3.19	1.8	**5.95**	12.1	100	37,300	16,726	371,208
Other coal gas			30.77		21.63	**52.4**	12.1	100	37,300	5,227	1,021,628
Crude oil						**0**	20	100	71,100	41,816	0
Gasoline						**0**	18.9	100	67,500	43,070	0
Diesel oil	10^4 ton	21.37	2.13		2.29	**25.79**	20.2	100	72,600	42,652	798,596
Fuel oil		467.97	0.41			**468.38**	21.1	100	75,500	41,816	14,787,262
LPG						**0**	17.2	100	61,600	50,179	0
Refine dry gas		0.37				**0.37**	15.7	100	48,200	46,055	8,213
Nature gas	10^8 m^3	32.17				**32.17**	15.3	100	54,300	38,931	6,800,588
Other oil production	10^4 ton	8.47				**8.47**	20	100	75,500	41,816	267,407
Other coke production						**0**	25.8	100	95,700	28,435	0
Other energy	10^4 tce	118.04	81.89	44.1	50.3	**294.33**	0	0	0	0	0
Total											347,695,831
Net import electricity from CCPG									24,237,240		
Average emission rate of CCPG in 2007									1.10197		
Total emission of CO_2 from CSPG in 2007									**374,404,628**		
Total Power supply of CO_2 from CSPG in 2007									**383,087,370**		
2007 Emission factor of CSPG									**0.97733**		

Data source: *2008 China Energy Statistics Yearbook*

Table A1.7 Weighted average emission factor of CSPG in the past 3 years

		2005	2006	2007	Remark(2005-2007)
1	Total generation(MWh)	**289,433,531**	**336,534,748**	**383,087,370**	336,351,883
2	Total emissions (tCO_2e)	**297,544,857**	**335,809,186**	**374,404,628**	335,919,557
	Weighted average emission factor	Total emissions of 2005-2007 /Total generation of 2005-2007			**0.99871**

6

Calculation for BM：

Table A1.8 Sheet for λ_{Coal}, λ_{Oil}, $\lambda_{Gas\ calculation}$, 2007 CSPG

Fuel sort	unit	Guangdong	Guangxi	Guizhou	Yunnan	subtotal	Average caloric value (kJ/kg)	Emission factor (kgCO2/TJ)	Oxidation rate (%)	Emission of CO_2(tCO_2e)
		A	B	C	D	E=A+B+C+D	F	G	H	I=E*F*G*H/100,000
Raw coal		8,214.78	1,750.63	4,298.8	3,170.79	17,435	20,908	87,300	100	318,235,546
Refined coal		3.46	0	0	0	3.46	26,344	87,300	100	79,574
Other washed coal	10^4	0	0.65	21.58	14.64	36.87	8,363	87,300	100	269,184
Briquette coal	ton	271.25	0	0	0	271.25	20,908	87,300	100	4,951,041
Coke		0.04	1.69	0	2.15	3.88	28,435	95,700	100	105,584
Other coke		0	0	0	0	0	28,435	95,700	100	0
Sort total										323,640,928
Crude oil		0	0	0	0	0	41,816	71,100	100	0
Gasoline		0	0	0	0	0	43,070	67,500	100	0
Diesel oil	10^4	21.37	2.13	0	2.29	25.79	42,652	72,600	100	798,596
Fuel oil	ton	467.97	0.41	0	0	468.38	41,816	75,500	100	14,787,262
Other petroleum products		8.47	0	0	0	8.47	41,816	75,500	100	267,407
Sort total										15,853,266
Natural gas	10^8	321.7	0	0	0	321.7	38,931	54,300	100	6,800,588
Coke oven gas	m^3	0	9.6	31.9	18	59.5	16,726	37,300	100	371,208
Other coal gas		0	307.7	0	216.3	524	5,227	37,300	100	1,021,628
LPG	10^4	0	0	0	0	0	50,179	61,600	100	0
Refine dry gas	ton	0.37	0	0	0	0.37	46,055	48200	100	8,213
Sort total										8,201,637
Total										347,695,831

Data source: *2008 China Energy Statistics Yearbook*

According to the table above：$\lambda_{Coal,y}$ = 93.08%，$\lambda_{Oil,y}$ =4.56%，$\lambda_{Gas,y}$ = 2.36%

Table A1.9 Eefficiency Level of the Best Power Generation Technology Commercially

	Variable	Consumption rate (gce/kWh)	Efficiency of Power Supply	Emission Factor of Fuel(tc/TJ)	Oxidation Factor	Emission Factor(tCO_2e /MWh)
			A	B	C	D=3.6/A/1000*B*C*44/12
Coal	$EF_{Coal,Adv}$	38.10	87,300	1	0.8249	38.10
Gas	$EF_{Gas,Adv}$	49.99	75,500	1	0.5437	49.99
Oil	$EF_{Oil,Adv}$	49.99	54,300	1	0.3910	49.99

Data source: DNA publication of 2 Jul. 2009

Table A1.10 Percentage of the CO_2 emission from different type of fossil fuel among total CO_2 emission

	Coal	Oil	Gas	Emission factor of fuel-fired power (tCO_2e/MWh) ($\lambda_{Coal}*EF_{coal,Adv}+\lambda_{Oil}*EF_{oil,Adv}+\lambda_{Gas}*EF_{gas,Adv}$)
λ	93.08%	4.56%	2.36%	0.8018
EF_{Adv}	0.8249	0.5437	0.3910	

Table A1.11 BM calculation of CSPG

	Installed Capacity in 2005	Installed Capacity in 2006	Installed Capacity in 2007	New Added Installed Capacity in 2005~2007	% of New Added Installed Capacity
	A	B	C	D=C-A	
Fuel-fired Power(MW)	54,507	68,963	80,610	26,103	71.98%
Hydro Power(MW)	30,347.1	34,176	40,340	9,992.9	27.56%
Nuclear Power(MW)	3,780	3,780	3,780	0	0.00%
Wind Power(MW)	83.4	183	250	166.6	0.46%
Total(MW)	**88,717.5**	**107,102**	**124,980**	**36,262.5**	**100.00%**
% of Installed Capacity in 2006	70.99%	85.70%	100%		

$EF_{BM,y}$=0.8018×71.98%=0.5772 tCO_2/MWh

Calculation of CM:

Table A1.12 Calculation Sheet of CM Emission Factor of CSPG

	OM Emission Factor (tCO_2e/MWh)	BM Emission Factor (tCO_2e/MWh)	CM Emission Factor =(OM+BM)/2 (tCO_2e/MWh)
CSPG	0.9987	0.5772	0.78795

Formula: CM Emission Factor = (BM + Simple OM) /2 (Weights ω_{OM} and ω_{BM} , by default, are 0.5)

Annex 4

MONITORING INFORMATION

No further background information is used in the application of monitoring methodology.

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