CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

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Project name: Suqian Kaidi Biomass Co-generation Project
Version: 01
Date: 05/01/2009

A.2. Description of the project activity:

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Suqian Kaidi Biomass Co-generation Project (hereafter referred to as the proposed project) is a biomass utilization project developed by Suqian Kaidi Green Energy Development Co., Ltd.(hereafter referred to as the Project Owner) is located west to Ningsuxu Highway, North to Gusu Road, Suqian Economic Development Area, Suqian City, Jiangsu Province, P.R. China.

The scenario existing prior to the start of implementation of the project activity is the generation of power in the grid, generation of heat in coal-fired boilers and the biomass residues(mainly includes rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw) are dumped or left to decay under mainly aerobic conditions. The latter applies to, for example, dumping and decay of biomass residues on fields or burnt in an uncontrolled manner without utilizing it for energy purposes.

The proposed project will process about 185, 700tonnes (wet) of biomass residue annually, of which rice husk and straws are the main biomass fuel. 2 sets of 65t/h Circulating Fluidized Bed (CFB) boiler and 2 sets of 12MW steam turbines generator units will be installed. Therefore, the total installed capacity of the Project is 24MW. The annual operation time is estimated to be 6000 hours with a net electricity of 126,720MWh and a net heat generation of 541,602GJ per year. It is estimated that the proposed project will generate GHG emission reductions 154,730 tCO_2e per year.

The electricity generated will be transmitted through a 35kV transformer at the site to Southwest 110kV substation and then supplied to Suqian power grid, which is a sub-grid of the East China Power Grid (ECPG). The proposed project will therefore replace the capacity of power plants on the ECPG, which is predominantly made up of coal fired power plants. The heat generated will be supplied to the plants in Suqian Economic Development Areato meet the process heat demand and replace the small coal-fired boilers.

Additionally, the proposed project will accomplish an extra benefit of greenhouse gas (GHG) mitigation derived from a reduction of methane emissions by utilizing rice husk and straws from the local area which would be dumped or left decay under mainly aerobic conditions and burned uncontrolled outside in the fields.

The baseline scenario is the same as the scenario existing prior to the starting of implementation of the project activity.

The proposed project will not only supply renewable electricity to grid generating emission reductions, but it will also contribute to sustainable development of the local community and the host country by means of:

- Supply of clean renewable energy to ECPG with improvements to the local energy structure;
- Promoting the comprehensive utilization of resources and mitigating emissions caused by decay or uncontrolled fire of the biomass residues;
- Increasing local incomes and providing 93 job opportunities;
- Decreasing the GHG emission from the fossil-fuel fired power plants and the GHG emission from the uncontrolled burning of the biomass residues as well as the emission of SO_x, NO_x and dust.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity (ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Peoples' Republic of China (host)	Suqian Kaidi Green Energy Development Co., Ltd	No
United Kingdom of England and Northern Ireland	Camco International Limited	No
United Kingdom of England and Northern Ireland	Camco Carbon Limited	No

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See Annex 1 for details

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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A.4.1.1. Host Party(ies):

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People's Republic of China

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

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Jiangsu Province

A.4.1.3. City/Town/Community etc:

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Suqian city

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

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The proposed project activity is located west to Ningsuxu Highway, North to Gusu Road, Suqian Economic Development Area, Suqian City, Jiangsu Province, P.R. China.
The center of plant has geographical coordinates of 118°14′36″ east longitude 33°55′9″north latitude. The figureA-1 shows the location of the proposed project.

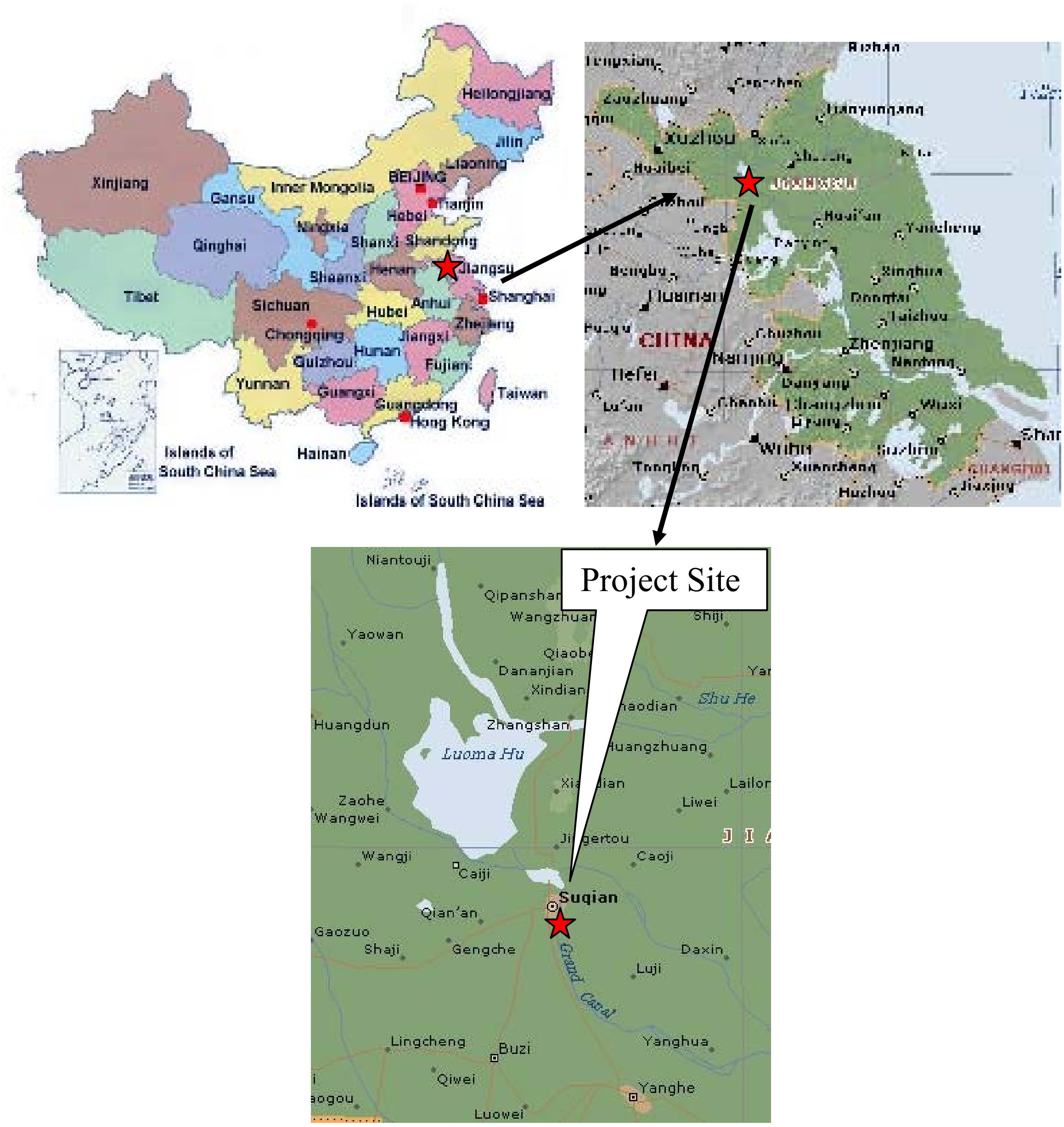

Figure A-1. The location of Suqian Kaidi Biomass Co-generation Project

A.4.2. Category(ies) of project activity:

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The proposed project falls into:
Sectoral Scope 1: energy industries (renewable - / non-renewable sources)
Project Activity: Grid-connected renewable power generation;

A.4.3. Technology to be employed by the project activity:

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Scenario prior to the start of the implementation of the project activity:

The equivalent electricity is supplied from the ECPG, which is dominated by coal-fired power plants.

The process heat demand in the Suqian Economic Development Area is or would be met by small coal-fired boilers. There are some existing coal-fired boilers. For the existing boilers, which would have annual inspection, as long as the inspection passes, they will be in operation. If the existing boilers retired, the owner would install some new coal-fired boilers to meet the process heat as there is no other heat source nearby. Besides, according to the Suqian Economic Development Area's plan, there will be more and more enterprises entering into this industry area. As the new enterprises move into the Suqian Economic Development Area, the demand for process heat would grow as well and it is common practice that the enterprises would install their own small coal-fired boilers to meet the process heat demand. The coal fired boilers are generally traditional boilers, with small capacity, low efficiency and high pollution to the surroundings. The design lifetime for those kinds of boilers is 30 years In fact, if operate well, the average commercial lifetime is above 25 years.

The biomass residues which are to be utilized in the proposed power plant are currently dumped or leftdecay under mainly aerobic conditions and burned uncontrolled outside in the fields.

Baseline Scenario:

The baseline scenario is the scenario prior to the start of the implementation of the project activity as above. In the absence of the proposed project, the scenario will continue.

Project Activity Scenario:

The technology employed by the proposed project is advanced domestic technology. The proposed project will install two sets of 65t/h circulating fluid bed (CFB) boilers with medium temperature and Sub-high pressure. At the same time, two 12MW steam turbines and two suited generators will be applied in the proposed project .The steam turbine employed is medium temperature and Sub-high pressure extraction condensing steam turbine. The total installed capacity of the proposed project is 24MW.

The key technical specifications of boiler, turbine and generator are listed in the table below.

TableA-2 Key Equipments Parameters:[1]

STEAM TURBINE and GENERATOR	
Manufacturer	NanJing Steam Turbine(Group) Co., Ltd
Model	C12-4.90/0.981-12/435℃
Type	Medium temperature and Sub-high pressure extraction condensing steam turbine
Rated power	12MW
Rate extraction steam volume	15t/h

[1] Equipment purchase Agreement,Annex1, from the Project Owner

Maxium Extraction steam volume when Rate electricity capacity is 6.59MW	45t/h
Rated voltage	6.3KV
Efficiency factor	0.85
Rated rotating speed	3000r/min
Rated frequency	50Hz
Lifetime	30years
Quantity	2
BOILER	
Manufacturer	Jiangxi Jianglian Energy and Environmental Protection Co., Ltd
Model	KG65-450/5.29-FSWZ-Ⅰ
Type	Medium temperature and Sub-high pressure Circulating Fluidized Bed
Rated steam pressure	5.29MPa
Rated steam temporary	450℃
Efficiency	≥86 %
Lifetime	30years
Quantity	2

The biomass residues utilized in this proposed project will be mainly rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw. The rice husk will be packed and stored temporarily at the rice mills. Some collection stations will be set up near to the resources for the straws to be processed and stored temporarily. From there the straws will be transported to the plant according to the dispatch schedule. The proposed radius for biomass collection is 90km around the project site as well as the area where Suqian city covers.

The biomass residues are weighed by the weighbridge before fed into fuel entering system to the boiler for combustion or into the storehouse in the plant for future usage. The steam entered into the turbine is used for power generation and some is extracted for heat supply. The heat generated by the proposed project will be supply to the local industry users as process heat in the industrial area.

The boiler smoke will be treated by a high efficiency bag filter and then carried to the ash storeroom. It is estimated that the annual ash generated from the power plant will be very limited. The ash is expected to be picked up by the local farmers and used as fertilizer.

All of the turbine and generator system will be supplied by Chinese domestic suppliers as well as the other auxiliary equipments installed in the power plant.

A flow diagram showing the power plant operation is provided as below. The monitoring equipments and their location are presented in section B.7.2. Figure B-3

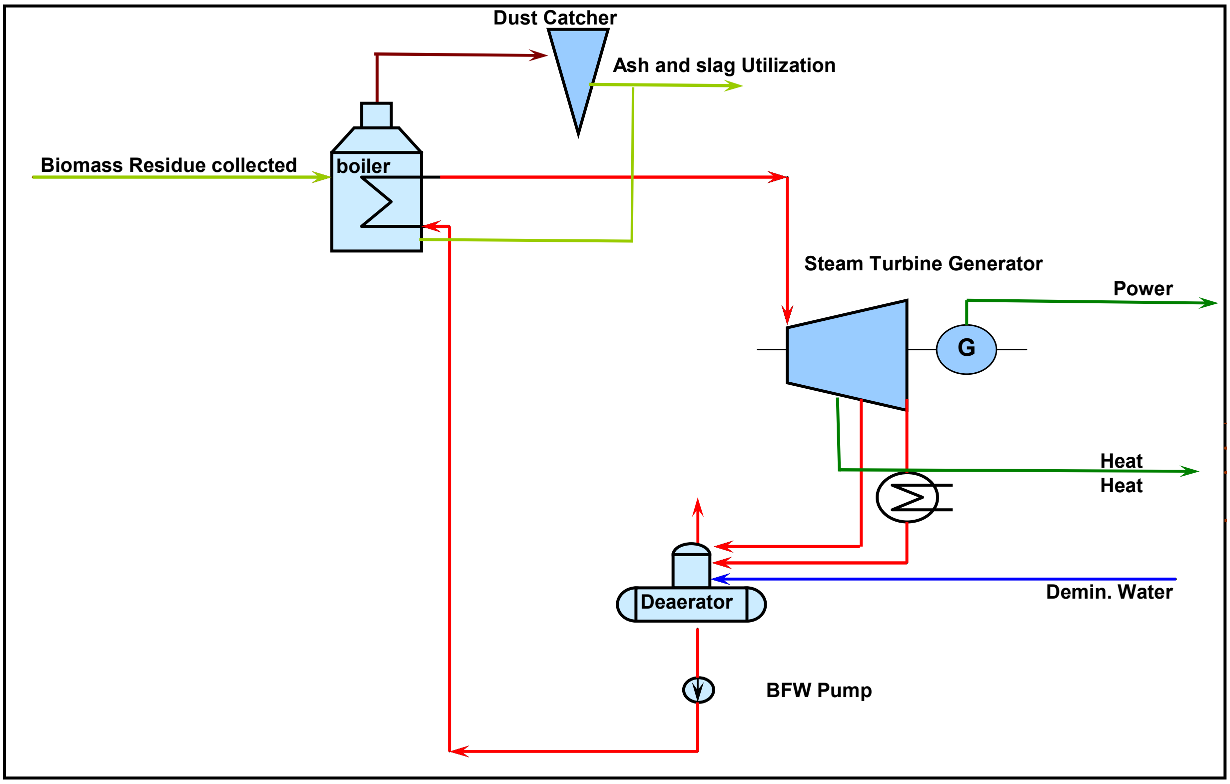

Figure A-2 Diagram of the plant

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

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A crediting period of 7 (seven) years (renewable twice) is selected for the project activity. During the first crediting period, 1st July 2009 to 30th June 2016, the proposed project is expected to lead to emission reductions of 154,730 tCO_2e per year. The estimated amount of emission reductions over the chosen crediting period is indicated below[2].

Years	Annual estimation of emission reductions in tones of CO_2 e
01/07/2009-30/06/2010	129,112
01/07/2010-30/06/2011	154,730
01/07/2011-30/06/2012	154,730
01/07/2012-30/06/2013	154,730
01/07/2013-30/06/2014	154,730
01/07/2014-30/06/2015	154,730
01/07/2015-30/06/2016	154,730
Total estimated reductions (tones of CO_2 e)	1,057,490

[2] The proposed project will not supply heat in2009.

Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tones of CO_2e)	151,070

A.4.5. Public funding of the project activity:

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There is no public funding for this project.

SECTION B. Application of a baseline and monitoring methodology:

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

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1. ACM0006 (Version 06.2) – "*Consolidated methodology electricity generation from biomass residues*"
2. *"Combined tool to identify the baseline scenario and demonstrate additionality".* (Version 02.2)
3. ACM0002 (Version 08) – "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*"
4. "*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*" (Version 02)
5. *"Tool to calculate baseline, project and/or leakage emissions from electricity consumption"* (Version 01)

For more information regarding the methodology, please refer to the link:

http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

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The approved methodology ACM0006 is applied here to determine the baseline of the proposed project. The project activity is a newly installed biomass power plant in the East China Power Grid (ECPG). The proposed project activity includes the installation of a new power generation plant at a site where currently no power generation occurs. Therefore, it is a "Greenfield power project".

The proposed project meets all applicability conditions of methodology ACM0006 which are listed as follows:

- *No other biomass types than biomass residues, as defined in the methodology, are used in the project plant and these biomass residues are the predominant fuel used in the project plant (some fossil fuels may be co-fired);*
  Rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw will be used as the main biomass fuel. Currently these biomass sources are dumped or left to decay under mainly aerobic conditions or burned in an uncontrolled way outside in the fields. A small amount of diesel will be used to help start-up of the boilers.

- *For projects that use biomass residues from a production process, the implementation of the project shall not result in an increase of the processing capacity of raw input or in other substantial changes in this process;*
  The biomass residues used by the proposed project are byproducts of agriculture crops, not from a production process.

- *The biomass residues used by the project facility should not be stored for more than one year;*
  The straws are directly bought from the farmers at the temporary storage stations at which the straws should not be stored for more than one year. The rice husks are directly bought from the rice mills and transported to the plant to use.

- *No significant energy quantities, except from transportation or mechanical treatment of the biomass residues, are required to prepare the biomass residues for fuel combustion, i.e. projects that process the biomass residues prior to combustion (e.g. esterification of waste oils).* There will be a small amount of energy consumption during the preparation of the biomass residues. This preparation includes mechanical treatment or transportation only, and the mechanical treatment includes such as cutting and sheaving. Except for these, the proposed project will not have significant consumption of fossil fuels.

Therefore, ACM0006 is applicable to the proposed project.

B.3. Description of the sources and gases included in the project boundary:

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Emission sources:

For the proposed project, the following emission sources shall be included:

- CO_2 emissions from on-site fossil fuel and electricity consumption that is attributable to the project activity. This includes fossil fuel co-fired in the project plant, fossil fuel used for on-site transportation of shredders ,forklift tor other equipment, as well as many other sources that are attributable to the project activity;
- CO_2 emissions from the electricity consumption in the biomass residues pretreatment
- CO_2 emissions from off-site transportation of biomass residues that are combusted in the project activity
- CH_4 emissions due to combustion of biomass residues for electricity and heat generation in the project activity

According to the approved methodology ACM0006, the emission sources and GHGs in the project boundary are listed in the following table.

Table B-1 Overview on emissions sources included in or excluded from the project boundary

	Source	Gas		Justification / Explanation
Baseline	Electricity generation	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Heat generation	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Uncontrolled burning or decay of surplus biomass	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH_4	Included	Main emission source
		N_2O	Excluded	Excluded for simplification. This is conservative.

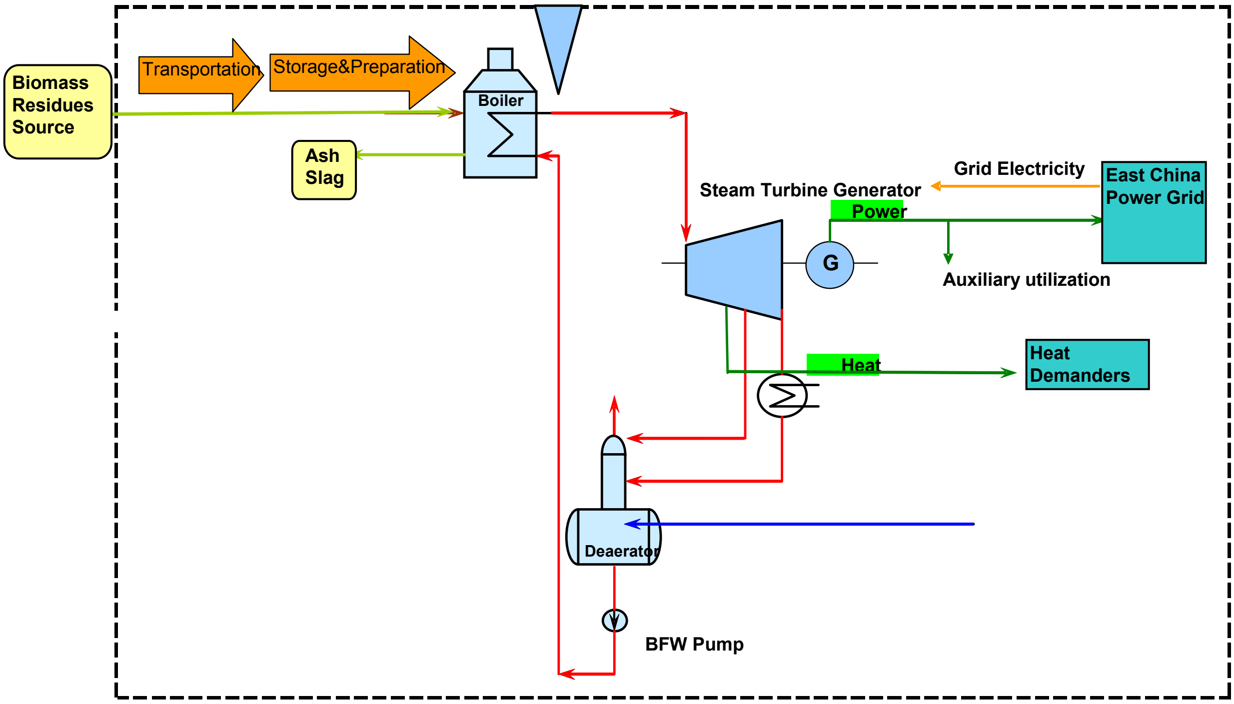
Project Activity	On-site fossil fuel and electricity consumption due to the project activity	CO_2	Included	May be an important emission source by the project activity
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Off-site transportation of biomass residues	CO_2	Included	May be an important emission source by the project activity
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Combustion of biomass residues for electricity and / or heat generation	CO_2	Excluded	It is assumed that CO2 emission from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH_4	Included	Since the CH_4 emissions of biomass residue are included in baseline, according to the methodology, this emission is included in project scenario.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Storage of biomass residues	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH_4	Excluded	Excluded for simplification. Since biomass is stored for not longer than one year, this emission source is assumed to be small.
		N_2O	Excluded	For simplification. This emission source is assumed to be very small.
	Waste water from the treatment of biomass residues	CO_2	Excluded	It is assumed that CO2 emission from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH_4	Excluded	No waste water generated during Biomass residue treatment. Therefore, no anaerobic treatment is involved during the treatment of biomass residues
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.

Spatial Extent of the Project Boundary:

The spatial extent of the project boundary encompasses

- The power plant at the project site;
- Heat users whose heat demand will be supplied by the proposed project;
- Transportation of biomass residues by trucks to the project site;
- All power plants connected physically to the ECPG, which covers Shanghai City, Jiangsu Province, Zhejiang Province, Anhui Province, and Fujian Province;

- The sites where the biomass residues would have been left for decay or dumped.



FigureB-1 Project Boundary

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

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According to the latest methodology ACM0006, "Combined Tool to identify the baseline scenario and demonstrate additionality"(Version02.2) should be used to identify the most plausible baseline scenario and demonstrate additionality.

This tool applies the following four steps:
STEP 1 Identification of alternative scenarios
STEP 2 Barrier analysis
STEP 3 Investment analysis (If applicable)
STEP 4 Common practice analysis

STEP 1. Identification of alternative scenarios

This step serves to identify all alternative scenarios to the proposed CDM project activity(s) that can be the baseline scenario through the following sub-steps:

Sub-step 1a. Define alternative scenarios to the proposed CDM project activity

Realistic and credible alternatives should be separately determined regarding:

- How power would be generated in the absence of the CDM project activity;
- What would happen to the biomass residues in the absence of the project activity;

- How the heat would be generated in the absence of the project activity.

For **power generation**, the realistic and credible alternatives may include, inter alia:

P1 The proposed project not undertaken as a CDM project activity.

P2 The continuation of power generation in an existing biomass residue fired power plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as (co-)fired in the proposed project.

P3 The generation of power in an existing captive power plant, using only fossil fuels.

P4 The generation of power in the grid.

P5 The installation of a **new** biomass residue fired power plant, fired with the same type and with the same annual amount of biomass residues as the Project, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the Project plant and therefore with a lower power output than in the Project case.

P6 The installation of a **new** biomass residue fired power plant that is fired with the same type but with a higher annual amount of biomass residues as the proposed project and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the proposed project. Therefore, the power output is the same as in the proposed project.

P7 The **retrofitting** of an existing biomass residue fired power, fired with the same type and with the same annual amount of biomass residues as the Project, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the Project plant and therefore with a lower power output than in the Project case.

P8 The **retrofitting** of an existing biomass residue fired power that is fired with the same type but with a higher annual amount of biomass residues as the proposed project and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the proposed project.

P9 The installation of a **new** fossil fuel fired captive power plant at the project site.

P2, P7 and P8 are excluded because the proposed project is a Greenfield project; therefore no continuation or retrofitting is plausible. P3 can also be excluded since there is no existing captive power plant, using fossil fuels near the project site.

P5 and P6 are excluded for a number of reasons. Firstly, biomass power plants including the lower efficiency ones are not common practice in the local area. Secondly, the installation of a new biomass residue fired power plant that is fired with the same type but with a lower efficiency of electricity generation is not feasible. A lower efficiency technology results in a less financially attractive project than the proposed project not undertaken as a CDM project activity.

Scenarios P2, P5, P6, P7 and P8 are therefore eliminated and scenarios **P1, P4 and P9** need further discussion.

For **heat generation**, the realistic and credible alternatives may include, inter alia:

H1 The proposed project not undertaken as a CDM project activity.

H2 The proposed project (installation of a cogeneration power plant), fired with the same type of biomass residues but with a different efficiency of heat generation (e.g. an efficiency that is common practice in the relevant industry sector).

H3 The generation of heat in an existing captive cogeneration plant, using only fossil fuels.

H4 The generation of heat in boilers using the same type of biomass residues.

H5 The continuation of heat generation in an existing biomass residue fired cogeneration plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as in the proposed project.
H6 The generation of heat in boilers using fossil fuels.
H7 The use of heat from external sources, such as district heat.
H8 Other heat generation technologies (e.g. heat pumps or solar energy).

H2 is excluded for a number of reasons. Firstly, because at present the technology of biomass cogeneration (including those with lower heat generation efficiency) in China is just started and are not common practice in China. Secondly, the installation of a new biomass residue fired power plant that is fired with the same type but with a lower efficiency of heat generation is not feasible. A lower efficiency technology results in a less financially attractive project than the proposed project not undertaken as a CDM project activity.

H3 and H5 are excluded because there is no fossil fuel fired cogeneration plant or any other cogeneration plant at or around the project site.

H4 is excluded as the biomass residues are dumped or burnt in an uncontrolled manner without utilizing it for energy purposes and there is no heat boiler using biomass residues in the local area, while using small coal-fired boiler is common practice in the local area for heating. Besides, it is not feasible for the individual enterprise to be equipped with expertise on the biomass collection biomass-boiler operation.

H7 is excluded since there is no district heat supply in the local area, heat sources from external sources such as district heating do not exist. Besides, as the annual average temperature of Suqian city 14.1℃, there is no plan to build district heat system in Suqian city.

H8 is excluded as due to the high investment cost for heat pumps or solar energy, neither solar energy nor heat pump to heat is feasible heat supply alternative for the Industry Area, besides, it is not easy for the heat pumps and solar energy to provide the heat that could meet the quality of the process heat in the Industrial Area.
Therefore, scenarios **H1 and H6** need further discussion.

For **the use of biomass residues**, the realistic and credible alternatives may include, inter alia:
B1 The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields.
B2 The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields.
B3 The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes.
B4 The biomass residues are used for heat and/or electricity generation at the Project site
B5 The biomass residues are used for power generation, including cogeneration, in other existing or new grid-connected power plants
B6 The biomass residues are used for heat generation in other existing or new boilers at other sites.
B7 The biomass residues are used for other energy purposes, such as the generation of biofuels
B8 The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry)

B2 is excluded, as the biomass residues utilized in the proposed power plant are currently dumped or left to decay under mainly aerobic conditions and burned in an uncontrolled way outside in the fields. The landfill plants seldom receive straws or rice husks.

B5 and B6 can be excluded because using biomass to generate electricity or heat is not common practice in this region. Moreover, near the project site, there are no existing power plants or boilers which can use rice husks or straws to generate energy.

B7 is excluded. Due to the high cost in the biofuels projects, the biofuel industry in China just started development and the biomass used for the biofuels are crops or non-crops plants mainly including the broomcorn, cassavas, sweet potato, coptis chinensis, hairy chestnut, tung tree, palm oil or waste cooking oil and/or waste fat from biogenic origin[3]. The biomass residues used in the proposed project are not common raw material to produce biofuel, and there is no biofuels production line near the proposed projects. Besides, according to Suqian city's future plan, there will be no biomass energy projects in Suqian.

Alternative B8 is excluded because, according to the biomass availability research report, there is only quite a little biomass residues used as fertilizer and feeding stuff for the livestock and the proposed project will not change the use of rice husk or the biomass straws as fertilizer or feedstock in process.

Therefore, for all the types of biomass residues mentioned above, scenarios **B1, B3 and B4** need further discussion.

Outcome of Step 1a:
As described above, the plausible alternative scenarios for the proposed project are **P1, P4** and **P9** for power generation, **H1 and H6** for heat generation and **B1**, **B3 and B4** for the biomass residues.

Sub-step 1b. Consistency with mandatory applicable laws and regulations:
In this sub step, alternative which is not compliance with laws and regulations will be eliminated:

Scenario P9 is not consistent with mandatory applicable laws and regulations. In 2006, the average annual utilization hours of Chinese fuel-fired power equipments are 5612 hours[4]. Considering the same annual electricity generation, the alternative baseline scenario for the proposed project should be a fuel-fired power plant with installed capacity of 26 MW. Furthermore, given that the proposed project is a grid-connected project, the alternative baseline scenario must be a grid-connected fuel-fired power project.

According to Chinese power regulations, fuel-fired power plants of less than 135MW[5] are prohibited to construct in the areas covered by large grids. The alternative of building a fossil fuel-

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[3]Interim Rules on management on demonstration non-food biofuels projects (Consultative Draft) Dated in 2007 issued by NDRC of China

[4] China Electric Power Yearbook 2007

[5] State Power Corporation of China. Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects. Beijing: China Electric Power Press, 2003

fired power plant with installed capacity of 26MW conflicts with Chinese regulations. Therefore, P9 is excluded.

Outcome of Step 1b:

The plausible alternative scenarios are compliance with laws and regulations: P1, P4, H1, H6, and B1, B3. In conclusion, the credible baseline scenarios are as follows:

Combined Scenarios	Baseline alternatives			Descriptions
	Electricty generation	Heat generation	Uses of biomass residues	
a	P1	H1	B4	The Project not undertaken as a CDM project activity
b	P4	H6	B1, B3	Purchasing electricity from the grid; generating heat from fossil fuel fired boilers; and dumping biomass residues (mainly includes rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw) to naturally decay. This is Scenario 2 in ACM0006

STEP 2. Barrier analysis

This step serves to identify barriers and to assess which alternatives are prevented by these barriers. Apply the following sub-steps:

Sub-step 2a. Identify barriers that would prevent the implementation of alternative scenarios:
The barriers that would prevent the implementation of alternative scenarios are not identified yet.

Outcome of Step 2a:
The barriers that would prevent the implementation of alternative scenarios are not identified yet.

Sub-step 2b. Eliminate alternative scenario which are prevented by the identified barriers:
Neither of the two combined scenarios is eliminated by step 2.

Outcome of Step 2b:
Neither of the two combined scenarios is eliminated by the step2. The two combined scenarios need to be further discussed in Step 3.

STEP 3. Investment analysis

According to the ACM0006 (Version 06.2), project participants shall identify the most plausible baseline scenario and demonstrate additionality using the latest approved version of the "Combined tool to identify the baseline scenario and demonstrate additionality".
However, Version 02.2 of the aforementioned tool establishes in footnote Nº2 (on the first page) that for project activities in which one or more alternatives are not available options to project participants (such as grid-connected power projects), a different procedure to demonstrate additionality and identify the baseline scenario must be followed. For example, methodologies that involve alternatives that is not under the control of project participants can continue to use, if desired, the additionality tool (provides benchmark and other tools that utilize information about the markets in which such projects might compete), and provide their own methods to develop and/or assess baseline scenario. Besides, "Guidance on the Assessment of Investment Analysis" issued in EB39 has clearly pointed that if the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.

According to the above, this PDD will use the Benchmark to analysis whether the proposed project activity is less economically or financially attractive than the alternatives without the revenue from CER. The investment analysis is conducted in the following steps:

Sub-step 3a. Apply benchmark analysis.
The financial benchmark rate of return (after tax) of Chinese Power Industries is 8% for the IRR of total investment.[3]

Sub-step 3b. Calculation and comparison of financial indicators.
1) Parameters needed for calculation of IRR
According to the Feasibility Study Report of the proposed project, parameters needed for calculation of IRR are as follows:

Table B-2 Parameters for calculation of IRR

Parameter	Value	Unit	Source
Installed capacity	24	MW	FSR
Project Lifetime	20	years	FSR
Net Power Generation output	126,720	MWh	FSR
Net Heat Generation output	541, 602	GJ	FSR
Static total investment	234,430,000	RMB	FSR
Tariff(excl. VAT) in first 15 years	547.01	Yuan/WMh	FSR
Tariff(excl. VAT) after the 15 years	333.33	Yuan/WMh	FSR
Annual O&M cost(including the fuel cost)	59,120,000	RMB	FSR
Heat price	29.85	Yuan/GJ	FSR
Biomass Purchase Price	240	Yuan/t	FSR
Income tax	25%		FSR
VAT for Electricity	17%		FSR
VAT for Heat	13%		FSR
Depreciation period	15	years	FSR
Residual Rate	4%		FSR
Expected CERs price	8	EUR	FSR

2) Comparison of the project IRR and the financial benchmark

In accordance with benchmark analysis, if the financial indicators of the proposed project, such as the project IRR, are lower than the benchmark, the proposed project is not considered to be financially attractive.

TableB-3 shows the project IRR with and without the income from CERs sale. Without the sales of CERs, the project IRR is 4.57% which is lower than the financial benchmark. Thus the proposed project is not financially acceptable. Taking into account the CDM revenues, the project IRR is 10.88% and higher than the financial benchmark. Therefore, the CDM revenues enable the project to overcome the investment barrier.

Table B-3 Comparison of IRR with and without the income from CERs sale

Item	Without CDM	Benchmark	With CDM
IRR	4.57%	8%	10.88%

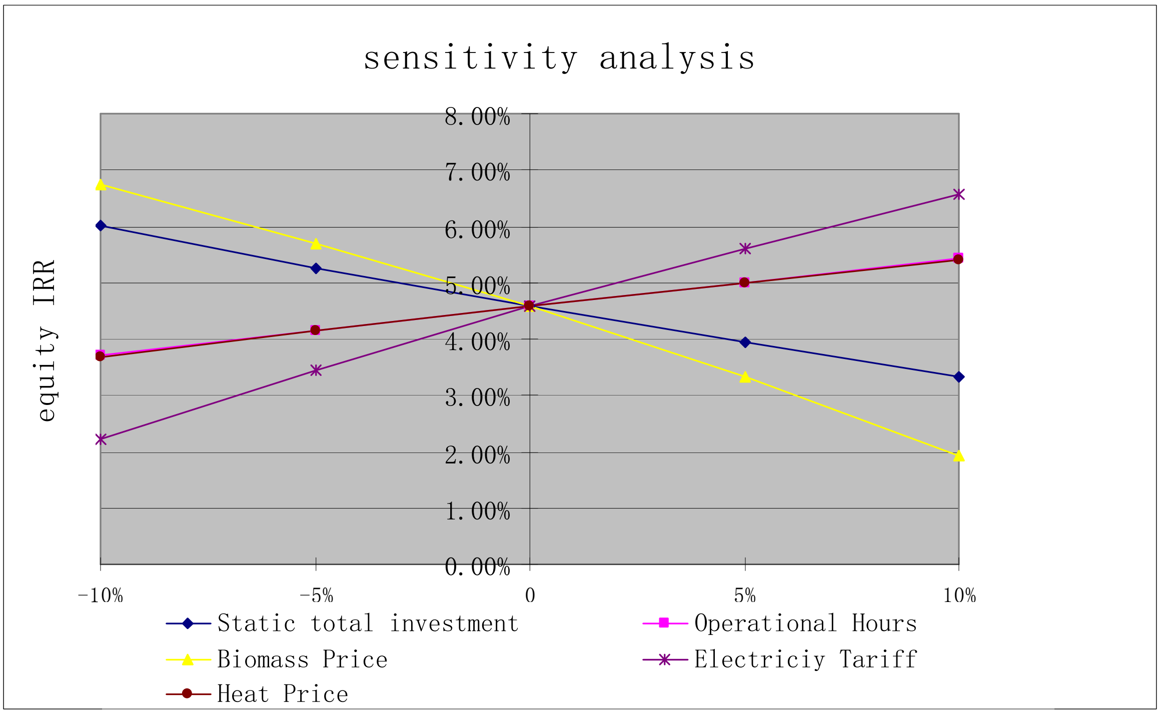
Sub-step 2d. Sensitivity analysis
For the proposed project, five parameters were selected as sensitive factors to check out the financial attractiveness:

1) Static total investment
2) Operation hours
3) Electricity tariff
4) Heat Price
5) Biomass Residue Price

Assuming the above five factors vary in the range of -10% to 10%, the project IRR (without the income from CERs sales) varies to different extents as shown in Table B-4 and Figure B-2 below.

TableB-4 Sensitivity analysis of the proposed project

	-10%	**-5%**	**0**	**5%**	**10%**
Static total investment	6.02%	5.27%	4.57%	3.93%	3.33%
Operational Hours	3.70%	4.14%	4.57%	5.01%	5.43%
Biomass Price	6.75%	5.71%	4.57%	3.33%	1.93%
Electriciy Tariff	2.21%	3.45%	4.57%	5.61%	6.58%
Heat Price	3.68%	4.14%	4.57%	5.00%	5.40%



FigureB-2 Sensitivity analysis of the proposed project

When the Static total investment, Operational Hours , Tariff, Heat Price and Biomass price are changing within the range of -10% to 10%, , the IRR of the proposed project is always lower than the investment benchmark, and lacking of financial attractiveness.
In summary, the project would be lacking of financial attractiveness without CER revenues.

Outcome of Step 3:
Based on the Investment Analysis above, the proposed project is not financially attractive without consideration of CERs sales revenues. Combined Scenario a "the proposed project not undertaken without being registered as a CDM project activity"is not feasible thus is eliminated.

So, the baseline scenario combination of the proposed project is Combined Scenario b (which belongs to Scenario 2 in the methodology).

Scenario	Power generation	Heat generation	Use of biomass residues
2	P4	H6	B1 or B3

STEP 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity.

According to the "Combined tool to identify the baseline scenario and demonstrate additionality", ECPG is selected as the relevant geographical boundary of the project activity, which covers Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, and Shanghai City and

includes more than 10 biomass residues power plants that are implemented or underway. Other biomass project activities within the boundary are shown in Table B-5:

Table B-5 Similar Project Activity[6]

Project	Capacity	Start Date	Comment
Zhongjieneng Jurong 2*12MW Biomass Direct Burning Power Plant Project	24MW	2005	Registered as a CDM project
Zhongjieneng Suqian 2*12MW Biomass Direct Burning Power Plant Project	24MW	2005	Registered as a CDM project
Biomass generation project, in Sheyang county, Jiangsu province, P.R. China	25MW	2006	Registered as a CDM project
Jiangsu Longyuan Donghai Biomass Power	24MW	2006	Applying for CDM registration
Straw-fired Power Generation Project in Chuzhou District, Huaian City, Jiangsu Province	33MW	2008	Applying for CDM registration
Gaoyou 4MW Biomass Power Generation Project	4MW	2007	Applying for CDM registration
Jiangsu Rudong Biomass Power Generation Project	25MW	2006	Applying for CDM registration
Jiangsu Lisen Biomass Power Project	20MW	2007	Applying for CDM registration
2*15MW biomass power generation project of Jiangsu Nantong Sun-green biomass power generation Co. Ltd.	30MW	2007	Applying for CDM registration
Jiangsu Guannan biomass cogeneration project	30MW	2007	Applying for CDM registration
Jiangsu Funing biomass cogeneration project	30MW	2007	Applying for CDM registration

[6] Data Source：
http://cdm.unfccc.int/Projects/registered.html
http://cdm.unfccc.int/Projects/Validation/index.html
http://cdm.ccchina.gov.cn/web/ItemList.asp

Biomass cogeneration project of Jiangsu Yancheng Fengjilu power Co. Ltd.	30MW	2006	Applying for CDM registration
Zhejiang Longyou 18MW biomass cogeneration project	18MW	2007	Applying for CDM registration
Anhui Anqing biomass power generation project	30MW	2007	Applying for CDM registration
Anhui Suzhou 2×12.5MW straw power generation project	25MW	2007	Applying for CDM registration
Anhui Hanshan biomass power generation project	30MW	2008	Applying for CDM registration
Anhui Shucheng biomass power generation project	30MW	2008	Applying for CDM registration
Fujian Kaisheng biomass cogeneration project	24MW	2007	Applying for CDM registration
Nanpingluxia town cyclic economy district biomass cogeneration project	Unknown	2008	Applying for CDM registration
Tongcheng Kaidi biomass power project	24MW	2008	Applying for CDM registration
Wuhe Kaidi biomass power project	24MW	2008	Applying for CDM registration
Wangjiang Kaidi biomass power project	24MW	2009	Applying for CDM registration

Sub-step 4b. Discuss any similar options that accruing.

These project activities will not lead to change the additionality of the proposed project. Because the projects mentioned above are also endeavour to become CDM projects or have been registered as CDM project to mitigate the financial risk.
If the proposed project can be successfully registered by EB, the CERs sales revenue will help the project owner to gain the investment return equivalent to that of the benchmark or more, and to reduce the risks associated with the uncertainty of the electricity tariff, heat price and biomass price. All of these are important insurances for the proposed project's successful implement.

To summarize, this project is not common practice and it is additional.

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 CDM project activity (assessment and demonstration of additionality):

>>
ACM0006 requires that the "Combined tool to identify the baseline scenario and demonstrate additionality" is used. Therefore, please refer to the section above where the additionality has been determined.

The CDM consideration and decision making process is presented as follows:
The project owner wanted to invest and develop biomass projects for a long time but due to the high cost, low profit of biomass power plants in China, the project owner found it is not feasible to invest in biomass project at that time. Then the project owner learned that some biomass projects were applying for CDM. The project owner began to learn about CDM and consider seeking help from CDM financing. The financial result in the FSR of internal similar project shows that with CER revenue, the IRR of the project is above benchmark, while the IRR is below benchmark without CER revenue. Therefore, the project owner determined to develop all biomass projects including this one as CDM project.

TableB-6 Milestones and Schedule in Project Implementation

September 2007	The FSR of other internal similar projects showed that those projects would be not financial attractive with out CER revenues, and carbon finance is strongly suggested. Thus, the management board decided to develop all their biomass residue projects including this one as CDM projects.
September 2007	EIA was finished
October 2007	EIA was approved by EPC of Jiangsu Province
October 2007	FSR was finished, which showed that without CER revenue, the project is not feasible and pointed out clearly to implement the project as CDM project can make the project financially attractive.
November 2007	CADA was signed with CAMCO
November 2007	Key Equipment Purchase agreement signed (Project Starting Date)
December 2007	Project was approved by DRC of Jiangsu Province
May 2008	Construction started
June 2009	Estimated Commission date

Based on the analysis in B.4 and the above description, the CDM was seriously considered and the proposed project is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

EMISSION REDUCTION

The Project reduces CO_2 emissions through substitution of power and heat generation with fossil fuels by energy generation with biomass residues. The emission reduction ER_y by the project during a given year y is the difference between the emission reductions through substitution of electricity generation with fossil fuels ($ER_{electricity,y}$), the emission reductions through substitution of heat generation with fossil fuels ($ER_{heat,y}$), project emissions (PE_y), emissions due to leakage (L_y) and, where this emission source is included in the project boundary and relevant, baseline

emissions due to the natural decay or burning of anthropogenic sources of biomass residues($BE_{biomass,y}$), as equation (1):

$$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y \quad (1)$$

Where,

ER_y = Emissions reductions of the Project during the year y (tCO_2/yr)

$ER_{heat,y}$ = Emission reductions due to displacement of heat during the year y (tCO_2/yr)

$ER_{electricity,y}$ = Emission reductions due to displacement of electricity during the year y (tCO_2/yr)

$BE_{biomass,y}$ =Baseline emissions due to natural decay or burning of anthropogenic source of biomass residues during the year y(tCO_2/yr)

PE_y = Project emissions during the year y (tCO_2/yr)

L_y = Leakage emissions during the year y (tCO_2/yr)

Lifetime aspects

According to ACM0006, for the scenario 2, only heat generation facilities in baseline should be considered the lifetime aspects. There are existing coal-fired boilers which would be replaced after the proposed project provides heat. There is also some emerging heat demand in the near future as the enterprises or plants move into the Industrial Area, which would be met by small-scale coal-fired boilers installed by the enterprises themselves. The normal lifetime of the small coal-fired boilers utilized in the local area is around 30 years.

The baseline, project, and leakage emissions are calculated respectively as following:

A. PROJECT EMISION

According the Table in B.3, the project emissions include:

- CO_2 emissions from transportation of biomass residues to the project site (PET_y),
- CO_2 emissions from on-site consumption of fossil fuels due to the project ($PEFF_y$),
- CO_2 emissions from consumption of electricity ($PE_{EC,y}$)
- Where this emission source is included in the project boundary and relevant: CH_4 emissions from the combustion of biomass residues($PE_{biomass,CH4,y}$)

Project emissions are calculated as follows:

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH4} \times PE_{Biomass,CH4,y} \quad (2)$$

Where,

PET_y = CO_2 emissions during the year y due to transportation of the biomass residues to the project site (tCO_2/yr)

$PEFF_y$ = CO_2 emissions during the year y due to fossil fuel consumption at the project site that is attributable to the project (tCO_2/yr)

$PE_{EC,y}$ = CO_2 emissions during the year y due to electricity consumption at the project site that is attributable to the project (tCO_2/yr)

GWP_{CH4}=Global Warming Potential for methane valid for the relevant commitment period

$PE_{biomass,CH4,y}$= CH_4 emissions from the combustion of biomass residues during the year y(tCH_4/yr)

a) Carbon dioxide emissions from combustion of fossil fuels for transportation of biomass residues to the project plant (PET_y)

Because the biomass residues will be transported to the power plant around the project site by trucks, CO_2 emissions from vehicles should be determined. According to the methodology ACM0006, it could be calculated by the following formula based on the distance and vehicle type (option 1):

$$PET_y = \frac{\sum_k BF_{T,k,y}}{TL_y} \cdot AVD_y \cdot EF_{km,CO2,y} \qquad (3)$$

Where,

PET_y = CO_2 emissions during year y due to transport of the biomass residues to the project plant (tCO_2/yr)

$BF_{T,k,y}$ = Quantity of biomass residue type k that has been transported to the Project site during the year y (tons of dry matter or liter)

TL_y = Average truck load of the trucks used (tons or liter) during the year y.

AVD_y = Average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the Project plant during the year y (km)

$EF_{km,CO2,y}$ = Average CO_2 emission factor for the trucks measured during the year y (tCO_2/km)

k = Types of biomass residues used in the project plant and that have been transported to the project plant in year y

b) Carbon dioxide emissions from on-site consumption of fossil fuels ($PEFF_y$)

According to the Feasibility Study Report, the fossil fuels (diesel oil) are only used for boiler start-up, the emissions from combusting fossil fuels are calculated as "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" as following:

$$PEFF_y = PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y} = \sum_i (FF_{projectplant,i,y} + FF_{projectsite,i,y}) \times COEF_{i,y} \qquad (4)$$

Where,

$PE_{FC,j,y}$ = CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2 / yr);

$FC_{i,j,y}$= Quantity of fossil fuel type *i* combusted at the project site that are attributable to the project activity duringthe year *y* (mass or volume unit per year)

$FF_{projectplant,i,y}$= Quantity of fossil fuel type *i* combusted in the biomass residue fired power plant duringthe year *y* (mass or volume unit per year)
$FF_{projectsite,i,y}$=Quantity of fossil fuel type *i* combusted at the project site for other purposes that are attributable to the project activity during the year *y* (mass or volume unit per year)

$COEF_{i,y}$ = CO_2 emission coefficient of fuel type i in year y (tCO_2 / mass or volume unit);

i = fuel types combusted in process j during the year y.

The "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" provides two procedures to determine $COEF_{i,y}$. The Option A requires carbon content and density of the diesel oil used in the project, however the data is not available now. Therefore the Option B is adopted as follows:

$$\mathrm{COEF}_{i,y} = NCV_{i,y} \times EF_{CO2,i,y} \quad (5)$$

Where,

$NCV_{i,y}$ = weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit); Diesel is used as the fossil fuel on-site. The National default value 42.652TJ/Gg is used here.

$EF_{CO2,i,y}$ = weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ); The IPCC default value 74,100 Kg/TJ is used here.

c) CO_2 emissions from electricity consumption ($PE_{EC,y}$)

CO_2 emissions from on-site electricity consumption ($PE_{EC,y}$) should be calculated using the latest approved version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". There is a little on-site electricity consumption will be consumed for the biomass residues treatment, except for auxiliary electricity consumption by the project plant. The emissions are calculated as Scenario A in Generic approach of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" as follows:

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \cdot EF_{EL,j,y} \cdot (1 + TDL_{j,y}) \quad (6)$$

Where,

$PE_{EC,y}$ = project emissions from electricity consumption in year y (tCO_2 / yr);

$EC_{PJ,j,y}$ = quantity of electricity consumed by the Project electricity consumption source j in year y (MWh);

$EF_{EL,j,y}$ = emission factor for electricity generation for source j in year y. (tCO_2/MWh)

$TDL_{j,y}$ = average technical transmission and distribution losses for providing electricity to source j in year y. The default value of 20% is used here.

j = source of electricity consumption in the proposed project.

In this case, refer to the description of project boundary, the only source of j is the ECPG

According to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"(Version 01), the proposed project belongs to Scenario A: Electricity consumption from the grid, so, we choose Option A1: Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the "Tool to calculate the emission factor for an electricity system" ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$).

d) Methane emission from Biomass residues combustion

Emissions from this source are caculated as follows:

$$PE_{Biomass,CH4,y} = EF_{CH4,BF} \cdot \sum_{k} BF_{k,y} \cdot NCV_{k} \qquad (7)$$

where:

$PE_{biomass,CH4,y}$: Project emissions from biomass controlled burning (tCH_4/yr)
$BF_{k,y}$: Quantity of biomass residue type *k* combusted in the project plant during the year *y* (ton of dry matter or liter)
NCV_k : Net calorific value of the biomass residue type *k* (GJ/ton of dry matter or GJ/liter)
$EF_{CH4,BF}$; CH_4 emission factor for the combustion of biomass residues in the project plant (tCH_4/GJ)

This PDD calculates EF_{CH4} using the following IPCC default data from Table4 and Table5 of the methodology. The biomass residues used in the proposed project are rice husk and straws which can be the best characterized as other solid biomass residues in line with relevant decisions by the Executive Board:

A	B	C	D	E
Waste type	**Default emission factor(kg CH4/TJ)**	**Assumed uncertainty**	**Conservativeness factor**	**Conservative EF,B×D(kg CH4/TJ)**
Other solid biomass residues	30	300%	1.37	41.1

Therefore, a conservative emission factor of 41.1 kg CH_4/TJ is obtained.

B. EMISSION REDUCTIONS DUE TO DISPLACEMENT OF ELECTRICITY

According to the methodology ACM0006, emission reductions due to the displacement of electricity are calculated by multiplying the net quantity of increased electricity generated with biomass residues as a result of the project activity (EG_y) with the CO_2 baseline emission factor for the electricity displaced due to the project ($EF_{electricity,y}$), as follows:

$$ER_{electricity,y} = EG_y \cdot EF_{electricity,y} \qquad (8)$$

Where,

$ER_{electricity,y}$ = Emission reductions due to displacement of electricity during the year y (tCO_2/yr)

EG_y = Net quantity of increased electricity generation as a result of the Project (incremental to baseline generation) during the year y (MWh)

$EF_{electricity,y}$ = CO_2 emission factor for the electricity displaced due to the Project during the year y (tCO_2/MWh)

In this case, all the electricity displaced is from the ECPG.

STEP 1: Determination of $EF_{electricity,y}$

The proposed project has been identified as the scenario 2 of ACM0006, i.e. the baseline of the power generation is P4 – "The generation of power in the grid", the emission factor for the displacement of electricity should correspond to the grid emission factor ($EF_{electricity,y} = EF_{grid,y}$). On the other hand, the installed capacity of the proposed project is more than 15MW, the $EF_{grid,y}$ shall be determined as a combined margin (CM), following the guidance in the section Baselines" in the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002). Refer to the relevant chapter of ACM0002, the combined margin (CM) should be calculated as the "Tool to calculate the emission factor for an electricity system" (hereafter referred to as the Emission Factor Tool).

Sub-step 1: Identify the relevant electric power system

According to the latest guidelines issued on 18th July, 2008 by China' DNA[7], the geographical boundary of ECPG covers, Jiangsu Power Grid, Zhejiang Power Grid, Anhui Power Grid, Fujian Power Grid, and Shanghai Power Grid.

Sub-step 2: Select an operating margin (OM) method

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

a) Simple OM

b) Simple adjusted OM

c) Dispatch data analysis OM

d) Average OM

Option b needs the annual load duration curve of the gird. The data required by this method is not publicly available in China. This option is not applicable.

Option c requires the detailed operating and dispatch data of power plants within the grid, but the dispatch data for the ECPG is not publicly available. This option is not applicable.

Option d can be only used when low-cost/ must run resources account for more than 50% of the total amount of grid power generation. As shown in table A1 of Annex 3, the ECPG is a coal-fired dominated power grid, where the installed capacity of low cost and must run plants account for 12.33%, 10.96%, 9.77%, 11.94% and 11.44% in 2002, 2003, 2004, 2005 and 2006 respectively. The fractions are all below 50%, so this option is not applicable.

Therefore the Simple OM is selected and the emission factor is calculated using the following data vintage:

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.

Sub-step 3: Calculate the operating margin emission factor according to selected method

[7] http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=2190

The Simple OM emission factor $EF_{grid,OM,y}$ 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-operating cost and must-run power plants/units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant/unit (Option A)
- 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)
- 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)

Data on fuel consumption, power generation and average efficiency of individual power stations is not publicly available in China. Therefore, in the proposed project activity, Option C is used and the following formula is used:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \cdot \times NCV_{i,k} \times EF_{CO2,i,y}}{EG_y} \quad (9)$$

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 (TJ/mass or volume unit)

$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type i in year y (tCO_2/TJ)

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 = 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)

Based on calculation from the China DNA (see Annex 3), the OM Emission Factor of the ECPG is 0.9540 tCO_2e/MWh.

Sub-step 4: Identify the cohort of power units to be included in the build margin (BM)

According to the tool to calculate the emission factor for an electricity system, the sample group of power units m used to calculate the build margin could consist of either:

(a) the set of five power plants 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 tool also states that project participants should use the set of power units that comprises the larger annual generation. In this case option (b) is used.

In terms of the vintage of the data Option 1 is chosen: For the first crediting period, the build margin emission factor is calculated 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.

Sub-step 5: Calculate the build margin emission factor

According to the tool, the build margin emission 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:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad (10)$$

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

m = Power units included in the build margin

y = Most recent historical years for which power generation data is available

Following guidance issued by the CDM Executive Board in response to a request for guidance from an accredited DOE on the determination of the Build Margin in methodology AM0005 in China[8], $EF_{BM,y}$ is calculated as the capacity weighted average emissions factor of new installed capacity rather than the generation weighted factor. Furthermore, it is suggested in the same guidance note that the efficiency level of the best technology commercially available in the provincial/regional or national grid of China is used as a conservative proxy for each fuel type in estimating the fuel consumption when calculating the Build Margin. The suggested approach is followed in the determination of the Build Margin for the purposes of this project.

Because capacities of technologies using coal, oil and gas cannot be separated from the total thermal power generation from available statistics, the following method is used for the calculation: first, use the recent one year available energy balance data and calculate percentages of CO_2 emissions of power generation using solid, liquid and gas fuel in the total CO_2 emission. Second,

[8]http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ

calculate grid thermal power emission factors, using the percentages (as weights) and emission factors of technologies corresponding to best available efficiencies. Lastly, the thermal power emission factor is multiplied by the percentage of thermal power in the newest 20% capacity in the grid, and the result is the Build Margin emission factor of the grid.

The steps and equations are as follows:

1. Calculate percentages of CO_2 emission of power generation using solid, liquid and gas fuel in total CO_2 emission.

$$\lambda_{Coal,y} = \frac{\sum_{i \in COAL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}} \quad (11)$$

$$\lambda_{Oil,y} = \frac{\sum_{i \in OIL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}} \quad (12)$$

$$\lambda_{Gas,y} = \frac{\sum_{i \in GAS,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO_2,i,j,y}} \quad (13)$$

Where,

$F_{i,j,y}$ = amount of fuel i (tce) consumed by power plants m in year y,

COAL, OIL and GAS refer to coal fuel, oil fuel and gas fuel in the subscript set.

2. Calculate thermal emission factor

$$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal,Adv} + \lambda_{Oil} \times EF_{Oil,Adv} + \lambda_{Gas} \times EF_{Gas,Adv} \quad (14)$$

Where,

$EF_{Coal,Adv}$, $EF_{Oil,Adv}$ and $EF_{Gas,Adv}$ are emission factors corresponding to commercially optimal efficient power generation technology using coal, oil and gas.

3. Calculate the BM of the Grid

$$EF_{Grid,BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal} \quad (15)$$

Where,

CAP_{Total} = new added total capacity,

$CAP_{Thermal}$ = new added thermal power capacity.

The data used to calculate OM and BM emission factors are all publicly available. The generation data and average self consumption rate data are from publicly available China Electric Power Yearbooks. The data of fuel consumption per electricity generated and net calorific values of fuels are from the China Energy Statistical Yearbooks. The $OXID_i$ and $EF_{CO2,i}$ data by fuels are from the "2006 IPCC Guidelines for National Greenhouse Gas Inventories," Volume 2 Energy.

According to the announcement "China's Regional Grid Baseline Emission Factors Renewed", the weighted average of coal consumption per kWh supplied of 30 new built 600 MW sub critical units in 2006 is adopted to determine the emission factor of the best advanced coal fired generation technology, which is 329.94gce/kWh. In other words, the efficiency of best advanced coal fired generation technology is 37.28%.

The maximum electricity supplied efficiency of oil and gas fired generation plants are regarded as approximate estimation of commercially optimal efficiency technology. Similarly, the fuel consumption per kWh supplied of best advanced oil and gas fired generation technology is determined to be 252 gce/kWh, which means a generation efficiency of 48.81%.

According to the Chinese DNA[9], the $EF_{Grid,BM,y}$ for the ECPG is 0.8154 tCO_2e/MWh. For the data source and the calculations, please see Annex 3.

Sub-step 6: Calculate the combined margin emissions factor

The combined margin emissions factor is calculated as follows:

$$EF_y = w_{OM} \cdot EF_{Grid,OM,y} + w_{BM} \cdot EF_{Grid,BM,y} \quad (16)$$

Where,

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,BM,y}$ = Build 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 defaults weights are used, i.e. each of the Operating Margin and Build Margin is weighted equally.

$w_{OM} = w_{BM} = 0.5$

In this case, for the first crediting period:

$EF_{grid,CM,y} = 0.5 \times EF_{grid,OM,y} + 0.5 \times EF_{grid,BM,y} = 0.8847$ tCO_2/MWh

STEP 2: Determination of EG_y

Where scenarios 2 apply, EG_y corresponds to the net quantity of electricity generation in the Project plant ($EG_y = EG_{project\ plant,y}$).

[9] http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf

C. EMISSION REDUCTIONS OR INCREASES DUE TO DISPLACEMENT OF HEAT

According to ACM0006, scenario 2 is applicable for the proposed project. As the identified baseline scenario is the generation of heat in boilers using fossil fuels, and then baseline emission can be calculated through the following formula:

$$ER_{heat,y} = \frac{Q_y \cdot EF_{CO2,BL,heat}}{\varepsilon_{boiler}} \qquad (17)$$

Where scenarios 2 apply,

$$Q_y = Q_{project\ plant,y} \qquad (18)$$

Where:

$ER_{heat,y}$: Emission reductions due to displacement of heat during the year y in tons of CO_2e.

$Q_{project\ plant,y}$: Net quantity of heat generated in the cogeneration power plant from firing biomass residues during the year y in GJ.

ε_{boiler} : Energy efficiency of the boiler that would be used in the absence of the project activity. The efficiency of boilers to be displaced is conservatively estimated as 100%.

$EF_{CO2,BL,heat,1}$: CO_2 emission factor of the fossil fuel type i used for heat generation in the absence the project activity (tCO_2/GJ). IPCC default value 0.0946 is used here.

According to the ACM0006, in case of scenario 2, the baseline scenario is that all heat generated by the cogeneration project plant would in the absence of the project activity be generated in fossil fuel fired boilers. Thus: $\boldsymbol{Q_y = Q_{project\ plant,y}}$

D. BASELINE EMISSIONS DUE TO NATURAL DECAY OR UNCONTROLLED BURNING OF BIOMASS RESIDUES

Step1 Determination of the quantity of biomass residues used as a result of the project activity ($EF_{PJ,k,y}$)

Where scenarios 2 apply, the total quantity of biomass residues used in the project plant ($\sum BF_{k,y}$) is attributable to the project activity and hence $EF_{PJ,k,y} = EF_{,k,y}$, namely the quanity of

biomass residues combusted in the project plant during the year y(tons of dry matter or liter)

Step 2 Estimation of methane emissions

Since the baseline scenario for biomass residue is uncontrolled burning or aerobic decay of the biomass residues, the emissions from avoided disposal of the biomass to be used by the project activity in year *y* can be calculated as:

$$BE_{biomass,y} = GWP_{CH4} \cdot \sum_k BF_{PJ,k,y} \cdot NCV_k \cdot EF_{burning,CHA,k,y} \qquad (19)$$

where:

$BE_{biomass,y}$: Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year *y* (tCO_2e/yr)

GWP_{CH4} : Global Warming Potential of methane valid for the commitment period (tCO_2e/tCH_4)

$BF_{PJ,k,y}$: Incremental quantity of biomass residue type *k* used as a result of the project activity in the project plant during the year *y* (tons of dry matter or liter)

NCV_k : Net calorific value of the biomass residue type *k* (GJ/ton of dry matter or GJ/liter)

$EF_{burning,CH4,k,y}$: CH_4 emission factor for uncontrolled burning of the biomass residue type *k* during the year *y* (tCH_4/GJ)

As lack of more accurate information, the IPCC value 0.0027tCH4 per ton of biomasss is used as default value for the product of NCV_k and $EF_{burning,CH4,k,y}$ which is recommended by the baseline methodology.
Furthermore, the uncertainty can be deemed to be greater than 100%, resulting in a conservativeness factor of 0.73, thus the emission factor of 0.001971t CH_4/t of biomass residue is used here.

E. LEAKAGE

Option L2 (ACM0006, Section Leakage) is used to demonstrate that there is an abundant surplus of the straws in the region of the project activity, and then the leakage can be neglected.
L2: Demonstrate that there is an abundant surplus of the biomass residue in the region of the project activity which is not utilized. For this purpose, demonstrate that the quantity of available biomass residue of type k in the region is at least 25% larger than the quantity of biomass residues of type k that are utilized, including the project plant.

As the project is still under construction, the biomass collections plan is not finalized yet. Originally, the collection area would cover a radius of 90 km around the project site as well as the Suqian city. Therefore, the above area is chosen as the geographical boundary to evaluate the leakage in the PDD.
If the biomass residues prices go up irrationally, the project owner may consider collecting the biomass residues in the villages nearby Suqian City as well. The real situation of leakage will be monitored once the project owner begins collecting biomass residues.

Based on the feasibility study report and the biomass residue availability research report, currently, the biomass residues used in the proposed project are: rice husk, wheat straw, rice straw, oil seed rape straw, corn straw, maize straw and cotton straw.

The leakage discussion for different types of biomass residues are as follows:
The rice husks consumed by the proposed project is estimated about 87,900tons, accounting for 41% of the total available rice husk (214,800 tons within Suqian city), accounting for 45% for the economic amount of rice husk that could supply (193,320 tons) ; The straws consumed by the proposed project are estimated about 97,800 tons, accounting for 3% of the total available straws (3,487,550tons within Suqian city) , accounting for 9% for the economic amount of straw that could supply(1,046,265 tons).
There is no specific amount of each type of straw that would be consumed by the proposed project, which will be monitored once the project owner begins collecting straws. The project owner will make sure that the consumption of each straw will not result in leakage.
Based the analysis above, we can find out that the quantity of available biomass residue in the evaluated geographical boundary for each type is far larger than 25% the quantity of biomass

residues of each type utilized including the project plant. Thus the utilization of the biomass residues by the project plant is considered to have no influence on the current biomass usage, and therefore the leakage of proposed project is considered 0. If there is any biomass residue that is not mentioned here, the project owner will monitor the project utilization amount and the availabilities once collecting it to evaluate its leakage.

In conclusion, the Project does not result increase of fossil fuel consumptions, i.e. the leakage is zero (L_y = 0 tCO_2e).

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

Data / Parameter:	*GWP_{CH4}*
Data unit:	tCO_2e/tCH_4
Description:	Global warming potential for CH_4
Source of data used:	IPCC 2006 Revised Guidelines
Value applied:	21 for the first commitment period. Shall be updated according to any future COP/MOP decisions.
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC 2006 default value
Any comment:	

Data / Parameter:	*$F_{i,y}$*
Data unit:	t (m^3)
Description:	Consumed quantity of fuel *i* in year(s) *y* by power plants in ECPG
Source of data used:	China Energy Statistical Yearbooks
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Detailed fuel consumption data of individual thermal power plants is not available to the public. The total consumption of various fuels is used instead.
Any comment:	None

Data / Parameter:	*$COEF_i$*
Data unit:	$tCO_2/t(m^3)$
Description:	CO_2 emission coefficient of fuel *i* (tCO_2 / mass or volume unit of the fuel)
Source of data used:	Calculated
Value applied:	Refer to Annex 3
Justification of the choice of data or description of	Calculated according to the methodology

measurement methods and procedures actually applied :	
Any comment:	None

Data / Parameter:	$GEN_{i,y}$
Data unit:	MWh
Description:	$GEN_{j,y}$ is the electricity (MWh) delivered to the ECPG from power plant using fuel *i* in year(s) *y* (Excluding low cost/must run power plants)
Source of data used:	China Electric Power Yearbooks
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Operation data of individual power plants is not available to the public. Summary data is adopted instead.
Any comment:	None

Data / Parameter:	$CAP_{i,y}$
Data unit:	MW
Description:	Installed capacity of power plants using fuel *i* in year(s) *y* in ECPG
Source of data used:	China Electric Power Yearbooks
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Operation data of individual power plants is not available to the public. Summary data is adopted instead.
Any comment:	None

Data / Parameter:	NCV_i
Data unit:	$TJ/t(m^3)$
Description:	Net calorific value of fuel *i*
Source of data used:	China Energy Statistical Yearbooks
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the requirement of methodology, country specific value is used.
Any comment:	None

Data / Parameter:	$OXID_i$
Data unit:	%

Description:	$OXID_i$ is the oxidation factor of the fuel *i*
Source of data used:	IPCC default value
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the requirement of methodology, IPCC default value is adopted.
Any comment:	None

Data / Parameter:	Eff_i
Data unit:	%
Description:	Power generation efficiency of commercially applicable technology of fuel *i* in ECPG at present time
Source of data used:	China CDM DNA
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the deviation method of EB, technology with maximum efficiency utilized can be the representative of such kind technology.
Any comment:	

Data / Parameter:	$EF_{CO2,i}$
Data unit:	tCO_2/TJ
Description:	Carbon content of fuel used for power generation
Source of data used:	IPCC default value
Value applied:	Refer to Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the requirement of methodology, IPCC default value is adopted.
Any comment:	

Data / Parameter:	$\mathbf{TDL_{j,y}}$
Data unit:	%
Description:	average technical transmission and distribution losses for providing electricity to source j in year y.
Source of data used:	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
Value applied:	20
Justification of the choice of data or	Because the data is not available within host country, the default value (20%) can be adopted for project emission calculation according

description of measurement methods and procedures actually applied :	to the Tool to calculate baseline, project and/or leakage emissions from electricity consumption. This is conservative.
Any comment:	

Data / Parameter:	$EF_{CO2,BL,heat}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of the fossil fuel type used for heat generation in the absence the project activity
Source of data used:	Default value from IPCC 2006. In the Project, the identified fossil fuel for heat generation is coal.
Value applied:	0.0946
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data is adopted from IPCC, this is conservative.
Any comment:	

Data / Parameter:	ε_{boiler}
Data unit:	
Description:	Average net energy efficiency of heat generation in the boiler that would generate heat in the absence of the project activity
Source of data to be used:	ACM0006
Value of data applied for the purpose of calculating expected emission reductions in section B.5	100%
Description of measurement methods and procedures to be applied:	Because the data is not available, the default value (100%) can be adopted according to the ACM0006. This is conservative
QA/QC procedures to be applied:	-
Any comment:	The data will be fixed during the crediting period which is conservative.

Data / Parameter:	$EF_{CH4,BF}$
Data unit:	tCH_4 /GJ
Description:	CH_4 emission factor for controlled burning of the biomass residue in the project plant
Source of data used:	IPCC 2006 Default Value ; ACM0006

Value applied:	30 for the first commitment period. Considering the conservativeness factor as 1.37, this should be adjusted as: $EF_{CH4,BF}$=30*1.37=41.1
Justification of the choice of data or description of measurement methods and procedures actually applied :	It is calculated using the conservative IPCC 2006 default values. The conservative factor is applied, as specified in the baseline methodology.
Any comment:	

Data / Parameter:	$NCV_k*EF_{burning,CH4,k,y}$
Data unit:	tCH_4/tonne
Description:	CH_4 emission factor for uncontrolled burning of the biomass residue
Source of data used:	IPCC 2006 Default Value ; ACM0006
Value applied:	0.001971
Justification of the choice of data or description of measurement methods and procedures actually applied :	The conservative factor is applied, as specified in the baseline methodology
Any comment:	

Data / Parameter:	$EF_{km,CO2}$
Data unit:	$kgCO_2e$/km
Description:	Average CO_2 Emission Factor for transportation of biomass with trucks
Source of data used:	IPCC 2006 default value from the Moderate Control index for the US heavy Duty Diesel Vehicle
Value applied:	1.011for the first commitment period
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC 2006 default value from the Moderate Control index for the US heavy Duty Diesel Vehicle
Any comment:	

Data / Parameter:	$EF_{CO2,diesel}$
Data unit:	$kgCO_2e$/TJ
Description:	Emission Factor of Diesel
Source of data used:	IPCC 2006 default value (Volume2.Chapter2.P16)
Value applied:	74,100 for the first commitment period
Justification of the choice of data or description of measurement methods	IPCC 2006 default value (Volume2.Chapter2.P16) for diesel

and procedures actually applied :	
Any comment:	

Data / Parameter:	NCV_i of fossil fuel combusted in Plant
Data unit:	TJ/tonne
Description:	Net Calorific Value(NCVi) of fossil fuel combusted in plant
Source of data used:	China Energy Statistical Yearbook
Value applied:	0.042652
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value for Diesel is used for estimation. If other fuels are to be used, the valued will be changed accordingly.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

Project emissions

a) Carbon dioxide emissions from combustion of fossil fuels for transportation of biomass residues to the project plant (PETy)

According to the Feasibility Study Report, the proposed project is designed to consume 87,900tons rice husk and 97,800 tons of straws annually (which mainly includes rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw), and the proposed vehicles for transportation these biomass residues are 3t, 5t, 8t, 10t -loading diesel trucks. The moisture content of rice husk is 12% and the average moisture content of straw is 20%.

The collection sites are still under consideration, not all determined yet. Preliminarily, the farthest distance the trucks travel will not farther than 90km away from the project site. Therefore, the longest distance and the smallest loading capacity is chosen, namely: AVD_y is adopted as 180km (2*90) and the loading per truck is adopted as 3t, which is conservative.

If the biomass residues prices go up irrationally, the project owner may consider collecting the biomass residues in the villages nearby Suqian City as well. The real average transportation distance and the average load will be monitored once the project owner begins to collect biomass residues.

The CO_2 emission factor for the trucks is 1.011 $kgCO_2e/km$, which is IPCC 2006 default value from the Moderate Control index for the US heavy Duty Diesel Vehicle (assuming the 3t-loading truck is diesel heavy truck). Refer to the equation (3), the emissions from biomass residues transportation are calculated as follow:

PET_y = 185,700 t / 3t * 180km * 0.001011tCO_2e/km = 11,265 tCO_2e.

The actual emissions from the transportation will be calculated according to monitored data.

b) Carbon dioxide emissions from on-site consumption of fossil fuels (PEFFy)

According to the project owner, the fossil fuel (diesel) is only used for boiler start-up, and the quantity of fossil fuel consumed in the project plant is estimated as 25t per year, and fossil fuel consumed for other purposes is assumed to be 0.

The $NCV_{i,y}$ and $EF_{CO2,I,y}$ are adopted IPCC default value. Therefore the $PEFF_y$ is calculated as follow:
$PEFF_y$ = 25t* 0.042652 TJ/t * 74.1tCO2e/TJ = 79tCO2e. The actual emissions will be calculated according to monitored diesel consumptions.

c) *<u>CO_2 emissions from electricity consumption ($PE_{EC,y}$)</u>*
There will be some electricity consumption in the bimass residues pretreatment, and it is estimated as 1,857MWh， thus the CO_2 emissions from electricity consumption (PEEC,y) can be calculated as:

$EF_{EL,j,y}$(=$EF_{grid,CM,y}$) is calculated in Annex 3 as 0.8847 tCO2e/MWh, where:
$PE_{EC,y}$ = 1,857MWh * 0.8847 tCO2e/MWh * (1+20%) = 1, 971 tCO2e

<u>d) Methane emission from Biomass residues combustion($PE_{biomass,CH4,y}$)</u>

According to the Feasibility Study Report and the project owner, the quantity of rice husk consumed annually is77,352t (dry weight), and the Net Calorific Value is 3100kal/kg(0.0130TJ/t),; the quantity of straws consumed annually is 78,240t(dry weight), and the average Net Calorific Value of the straws is 3000 kal/kg (0.0125TJ/t). Here, the biomass NCV is adopted as 3100 kal/kg for conservativeness.

CH_4 emission factor for controlled burning of the biomass residue in the project plant, $EF_{CH4,BF}$=41.1kgCH_4/TJ, which is calculated using the IPCC default values described in the methodology.So,
$PE_{biomass,CH4,y}$= (77,352+78,240)*0.0130*41.1kgCH_4/TJ=83tCH_4

Therefore the project emissions are calculated as:
PEy = PETy + PEFFy + PEEC,y +GWP_{CH4}* $PE_{biomass,CH4,y}$ = 11,265 tCO2e + 79tCO2e + 1, 971 tCO2e +21*83= 15,055tCO2e

Emission reductions due to displacement of electricity

<u>Step 1: Determination of $EF_{electricity,y}$</u>
Based on the description in B.6.1 and detailed calculation in Annex 3, the $EF_{electricity,y}$ = $EF_{grid,y}$ = 0.8847 tCO2e/MWh.

<u>Step 2: Determination of EG_y</u>
According to the Feasibility Study Report, the delivered electricity is 126,720MWh per year, i.e. EG_y = 126,720MWh. Therefore:
$ER_{electricity,y}$ = 126,720MWh * 0.8847 tCO2/MWh =112,109 tCO2e

Emission reductions or increases due to displacement of heat
According to the Feasibility Study Report, the proposed project is designed to supply 541,602GJ heat per year. The CO_2 emission factor of the fossil fuel type (coal) used for heat generation in the absence the Project is adopted from IPCC 2006, i.e. $EF_{CO2,BL,heat}$ = 0.0946tCO2e/GJ. The efficiency of the boiler is assumed to be 100% for conservativeness. Therefore:
$ER_{heat,y}$ = 541,602GJ * 0.0946tCO2e/GJ / 100% = 51, 236tCO2e

Uncontrolled burning or decay of biomass baseline emission
Step 1 Determination of the quantity of biomass residues used as a result of the project activity
The quantity of rice husk consumed annually in the proposed activity is 77,352t (dry weight) and the quantity of straws comsumed annually in the proposed acitivty is 78,240t(dry weight).

Step2 Estimation of methane emissions
As lack of more accurate information, the emission factor 0.001971 tCH_4/tonne biomass residue is used in the PDD, which is suggested by the baseline methodology.
So, Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year *y*,
$BE_{biomass,y} = GWP_{CH4} \cdot \sum_k BF_{PJ,k,y} \cdot NCV_k \cdot EF_{burning,CHA,k,y}$ =21tCH_4/tCO_2*(77,352t+78,240t) *0.001971 tCH_4/tonne=6,440 tCO_2e

Leakage
Based on the description in B.6.1, the leakage of the Project is not taken into account, i.e. L_y = 0tCO_2e

Emission Reductions
Refer to the equation (1), the emission reductions are calculated as:
$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y$ = 154,730 tCO_2e

The $ER_{heat,y}$ is not claimed in the year 2009.

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)
01/07/2009-30/06/2010	15,055	144,167	0	129,112
01/07/2010-30/06/2011	15,055	169,785	0	154,730
01/07/2011-30/06/2012	15,055	169,785	0	154,730
01/07/2012-30/06/2013	15,055	169,785	0	154,730
01/07/2013-30/06/2014	15,055	169,785	0	154,730
01/07/2014-30/06/2015	15,055	169,785	0	154,730
01/07/2015-30/06/2016	15,055	169,785	0	154,730
Total (tonnes of CO_2e)				1,057,490

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**$BF_{k,y}$**
Data unit:	Tons *of dry matter*
Description:	Quantity of biomass residue type *k* combusted in the project plant in year *y*.
Source of data to be used:	On-site measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*K=Rice husk: 77,352t* *K=Straws: 78,240t*
Description of measurement methods and procedures to be applied:	Use weight meters. Adjust for the moisture content in order to determine the quantity of dry biomass. The quantity shall be crosschecked with the quantity of electricity generated and any fuel purchase receipts. Continuously, prepare annually an energy balance
QA/QC procedures to be applied:	The meter will undergo calibration/maintenance subject to appropriate industrial standards. Direct measurements at the plant site will be cross-checked with an annual energy balance that is based on purchased quantities and stock changes
Any comment:	

Data / Parameter:	**$BF_{T,k,y}$**
Data unit:	Tone
Description:	Quantity of biomass residue type k that has been transported to the Project site during the year *y* where *k* are the types of biomass residues used in the project plant in year *y*.
Source of data to be used:	Measured data by weighbridge
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*The **wet quantity** is used here, which is more conservative.* *K=Rice husk: 87,900t* *K=Straws: 97,800t*
Description of measurement methods and procedures to be applied:	Each truck will be measured twice, loading weight and empty weight. The transferred biomass residues will be aggregated daily, monthly and yearly.
QA/QC procedures to be applied:	The measuring range of the weighbridge is from 0 to 30 tones, the minimum scale is 0.01 tones. The weighbridge will be calibrated and maintained according to relevant standards and regulars. The biomass residues purchase invoice will be kept for double check.
Any comment:	

Data / Parameter:	**Moisture content of the biomass residues**
Data unit:	% water content
Description:	Moisture content of each biomass residue type k

Source of data to be used:	On-site measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	12% for the rice husk 20% for the straws, including rice husk, wheat straw, rice straw, oil seed rape straw, maize straw, and cotton straw
Description of measurement methods and procedures to be applied:	Continuously monitored by moisture analyzer. Moisture content of the biomass residues will be both measured in collection points and in power plant.
QA/QC procedures to be applied:	The analyzers will be calibrated and undergo maintenance subject to appropriate industry standard annually
Any comment:	The moisture content of the biomass residues are taken into consideration in all the calculations of emission reductions. In case of dry biomass, monitoring of this parameter is not necessary.

Data / Parameter:	NCV_K
Data unit:	KJ/Kg
Description:	Net calorific value of the biomass residue of type k utilized in the project
Source of data to be used:	Feasibility Study Report
Value of data applied for the purpose of calculating expected emission reductions in section B.5	k=rice husk: 12958 k=straws (average): 12540
Description of measurement methods and procedures to be applied:	Measure the NCV based on the dry biomass. This parameter will be measured taking at least three samples (dry matter) for each measurement at a frequency of at least 6 months a time.
QA/QC procedures to be applied:	Measurements will be carried out at reputed laboratories and according to relevant international standards.
Any comment:	-

Data / Parameter:	AVD_y
Data unit:	km
Description:	Average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the Project plant during the year y
Source of data to be used:	On site records maintained at project site (log books)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*180*
Description of measurement methods and procedures to be	The data is recorded at the central collecting station for it is close to the project plant, based on the information given by the truck driver about the biomass supply site and the distance form the project.

applied:	
QA/QC procedures to be applied:	The data on distance of fuel supply site from the plant can be verified by cross checking data records on the distances available with information from other sources (e.g. maps)
Any comment:	If the biomass residues are supplied from different sites, this parameter will be taken from the longest distance.

Data / Parameter:	TL_y
Data unit:	Tonne
Description:	Average truck load of the trucks used during the year y
Source of data to be used:	Measured data by weightbridge and On site records maintained at project site (log books)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	3
Description of measurement methods and procedures to be applied:	Each truck will be measured twice, loading weight and empty weight. The loading data will be averaged monthly and yearly.
QA/QC procedures to be applied:	The weighbridge will be calibrated and maintained according to relevant standards and regulars. Check consistency of load records will be done frequently.
Any comment:	-

Data / Parameter:	$FF_{project\ plant,i,y}$
Data unit:	*In tonne or* m^3
Description:	Quantity of fossil fuel type *i* combusted in the project plant during year *y*
Source of data to be used:	On-site measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*25*
Description of measurement methods and procedures to be applied:	Use weight or volume meters.
QA/QC procedures to be applied:	The meter will under go calibration/maintenance subject to appropriate industrial standards. The consistency of metered fossil fuel consumption quantities can be cross checked with fuel purchased quantities and the stock change records
Any comment:	This should include fossil fuels co-fired in the project plant but not any other fuel consumption at the project site that is attributable to the project activity (e.g. for mechanical preparation of the biomass residues). There is only diesel used for start-up. If there is any other fossil fuel

	used, its quantity will be monitored too.

Data / Parameter:	$FF_{project\ site,,i,y}$
Data unit:	*Tonnes*
Description:	Quantity of fossil fuel type *i* combusted in the project site for other purposes that are attributable to the project activity during year *y*
Source of data to be used:	Use power plant and straw brokers daily operation record.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*0*
Description of measurement methods and procedures to be applied:	The power plant will collect diesel purchase receipt from fuel station and will document these ata monthly. The quantity of diesel combusted is equal to the quantity of stock at start of the month plus the purchased amount and then minus the stock at the end of the month.
QA/QC procedures to be applied:	Cross-check the measurements with an annual energy balance that is based on purchased quantities and stock changes
Any comment:	This should not include fossil fuels co-fired in the project plant but any other fuel consumption at the project site that is attributable to the project activity (e.g. for mechanical preparation of the biomass residues). If there is any fossil fuel used from shredders, forklift or other machines for the pretreatment of biomass residues, it will be recorded.

Data / Parameter:	$EC_{PJ,j,y}$
Data unit:	MWh/yr
Description:	The quantity of electricity consumed by the Project electricity consumption source j in year y
Source of data to be used:	Measured by meter
Value of data applied for the purpose of calculating expected emission reductions in section B.5	It is estimated as 1,857 MWh .
Description of measurement methods and procedures to be applied:	Hourly measurement and monthly recording; 100% of data will be monitored and electronic archived.
QA/QC procedures to be applied:	The accuracy of the meter is 0.5s and it will be calibrated and maintained according to relevant national regulations and/or standards. The electricity purchased invoice will be kept for double-checking. Data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.
Any comment:	

Data / Parameter:	**EGy**

Data unit:	MWh
Description:	Net quantity of increased electricity generation as a result of the Project (incremental to baseline generation) during the year y
Source of data to be used:	Measured by meters
Value of data applied for the purpose of calculating expected emission reductions in section B.5	126,720
Description of measurement methods and procedures to be applied:	Hourly measurement and monthly recording; 100% of data will be monitored and electronic archived.
QA/QC procedures to be applied:	The accuracy of the meter is 0.5s and it will be calibrated and maintained according to relevant national regulations and/or standards. The electricity sales invoice will be kept for double-checking. Data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.
Any comment:	

Data / Parameter:	**Q_y**
Data unit:	GJ/yr
Description:	Quantity of increased heat generation in the Project (incremental to heat generation in any existing cogeneration plants) that displaces heat generation in fossil fuel fired boilers during the year y
Source of data to be used:	Thermal meter
Value of data applied for the purpose of calculating expected emission reductions in section B.5	541, 602
Description of measurement methods and procedures to be applied:	The meter is installed on main heat supplying pipe. The meter will measure the flow, temperature and pressure individually and then calculate the supplied heat. The meter will measure the supplied heat continuously. Data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.
QA/QC procedures to be applied:	The heat sales invoice will be kept for double-checking.
Any comment:	

Data / Parameter:	-
Data unit:	Tons
Description:	Quantity of biomass residues of type k that are available
Source of data to be used:	Feasibility Study Report of the proposed project

Value of data applied for the purpose of calculating expected emission reductions in section B.5	k=rice husk: 214,800 t k=straws:3,487,550 t
Description of measurement methods and procedures to be applied:	Surveys or statistics from local agricultural bureau or other official public resource. If they are not available, the project owner will ask specialized institute to do biomass availability research.
QA/QC procedures to be applied:	This parameter will be reviewed annually according to the project data and official data.
Any comment:	This parameter is applicable since approach L_2 is utilized to rule out leakage.

B.7.2 Description of the monitoring plan:

This monitoring plan is to serve as a guideline for the project owner to monitor the emission reduction of the proposed project. The contents of the Monitoring Plan are highlighted as follows:

1. The CDM monitoring management

There is a CDM team underway for the proposed project comprising of personnel picked from the power plant who will perform the dual functions of power plant O&M and compliance with the CDM procedures as well as the personnel from Kaidi Holding Company's CDM department who will assist the project owner to monitor the project emission reductions and any leakage effects to make the project compliance with the CDM monitoring and verification requirements.

There will be a Chinese CDM project director and a CDM project manager in the CDM team. The respective of them are as follows:

Chinese CDM project director: Approving the monitoring and quality control manual, approving the monitoring report, appointing the monitoring manager.

CDM project manager: Reporting to the Chinese CDM project director, communicating with DOE and the buyers, organizing the relevant training, review all the documents related with the monitoring of the project, appointing the team members and their specific responsibilities.

2. Monitoring System Design

All the monitoring equipment installed is indicated in the following figure.

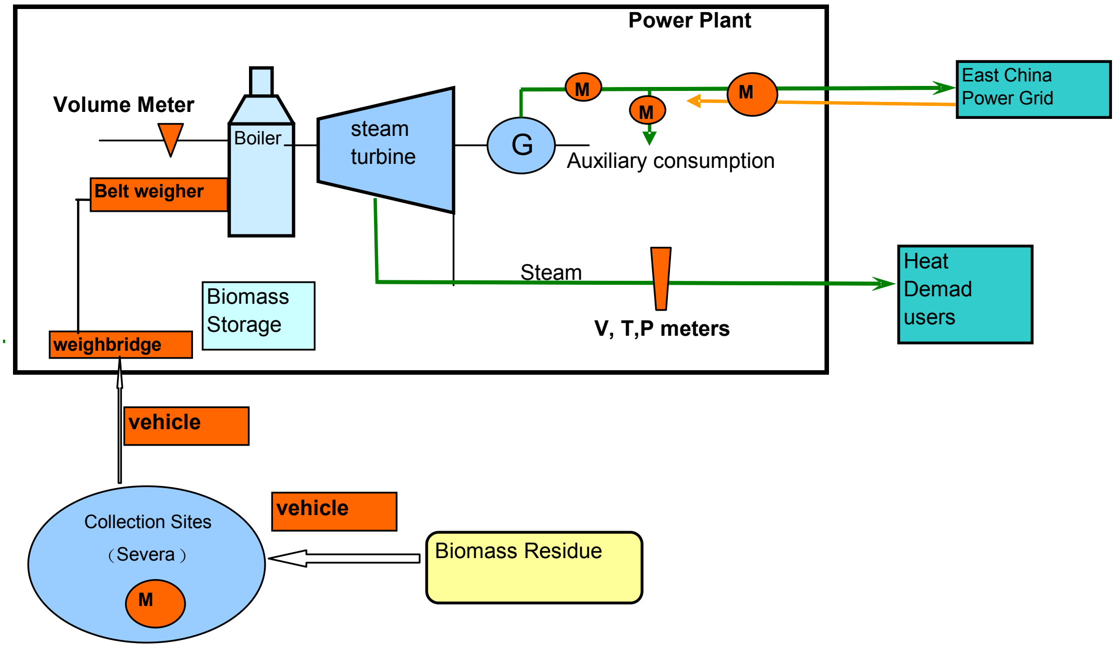


Figure B-3 Project boundary and monitoring map

2.1 Net electricity generation
There will be a meter installed on the project site monitoring the net electricity generation. The data of electricity supplied to the grid and purchased from the grid will be cross-checked by the invoices and the power transaction slip. The meter is 0.5 S double-way meters .The uncertainties of the meters are all less than 0.5 %.

In addition, a 10KV backup power supply will be available in site in the early time of the proposed project and the amount of electricity imported through this line will be checked by the invoice.

There will also be meters monitoring the gross electricity generated by the generators and the electricity consumed for auxiliary utilization. When the meter to monitor the net electricity generation goes wrong or the first data set is not within specified error limits, the net electricity could be calculated using the total electricity generated minus the auxiliary electricity consumed.

2.2 Heat supplied
There will be the heat supply meters including flow meter, pressure meter and temperature meter installed at power plant site when the project begins supplying heat.

The project owner will prepare backup procedures to deal with any errors occurred to the meters. In case of any errors happens, the heat supplied to the users by the proposed project shall be determined by the project owner and the users jointly according to the error handling procedures.

2.3 Biomass residues consumption
The amounts of each type of biomass residues collected at the collection sites, purchased at biomass procurement department of the power plant will be monitored by the weightbridge and the purchasing receipt. The biomass stock will be recorded monthly. The amount of the biomass residues combusted in the boiler will be monitored by the belt weigher. The moisture of the

biomass combusted will also be monitored. An energy balance will be recorded monthly to assist verifying the biomass combusted.

If significant difference among the data sources identified, the project developer will conduct further check the original records to find out reasons and correct. If the significant difference can't be resolved, the most conservative value of biomass utilized by the proposed project will be applied as monitoring results.

2.3 Fossil Fuel Consumption in the power plant
For fossil fuel used for starting up, flow meters will be equipped in the sucker and return pipe to monitor the quantity of diesel consumption.
Any fossil fuel used for the shredders, forklifts or any other machines for the biomass pretreatment in the project site will be monitored in weight or volume. This will be measured as follows:
"Fossil fuel combusted= Fuel purchased+ opening stock-Closing stock in fuel storage" and this data will recorded on a daily basis in the log books.

The purchase invoices will be used for cross-check, besides, if there is any data missing or significant error exists, the entire quantity of fossil fuel purchased in a particular monitoring period would be considered as combusted in the power plant.

2.4 Transportation of Biomass residues
The project developer of the proposed project will structure a recording and monitoring system within the biomass residues supply and management system covering all the biomass collection sites established by the proposed project. The quantity and type of biomass, transportation vehicle and transportation distance to the collection sites will be recorded by company staffs at the sites on a daily basis in the log books. The receipts and records regarding with biomass purchase by the proposed project will be documented and summarized for verification. The transportation of the biomass from the collection sites to the power plant will be monitored and documented by the project developer to determine the fossil fuel consumption by the biomass transportation activity. The transportation records will be documented and maintained for verification.

If data is missing for a particular truck load of biomass, the farthest distance recorded in the past would be assumed.
If the data is missing for a particular truck load of biomass, the smallest load recorded in the past would be assumed.

2.5 Electricity consumed on site
When the biomass residue is pretreated, the proposed project needs a certain amount of electricity from grid. This amount will be metered, and the record be kept for examination. It would be cross-checked by invoice if available.

If the monitoring data is missing, the data will be calculated conservatively as the project of the weight of straw smashed (in tons) and the electricity consumption factor (Kwh/ton). The electricity factor can be calculated as follows:
1) Collecting all the nameplate power (in Kw) and capacity (t/h)
2) Calculating the electricity factor corresponding to every shredders or forklifts which equals to power/capacity in Kwh/t)
3) Using the largest number as a conservative electricity factor for the calculation.

2.6 Leakage
Amount of biomass types consumed and Quantity of biomass types that is available in surplus in the counties that defined in Project Boundary will be monitored to check the leakage effect brought by the operation of the proposed project. This will be obtained from official information, such as agriculture statistics and survey of Counties defined within Project Boundary that supply biomass residues to the proposed project. If it is not available, the data will be calculated or estimated based on a survey conducted by project developer with the support from governmental entity or institute.

If any leakage occurs during the crediting period, the project developer will determine the parameters in terms of leakage effects according the definition in the PDD with the support from local government entity.

3. Calibration & Maintenance procedures

The meters or weighbridge installed in the monitoring system will be calibrated by a certified Party less than 3 years in accordance with the manufacturer's recommendations and National Regulations for ensuring reliability of the system. Calibrations shall be evidenced with certificates of calibration for the relevant meter(s) issued by a qualified body. A calibration and error log will be maintained to provide transparency and sound management.

4. Training, Record Keeping, Error or emergency handling and Reporting Procedures

4.1 Training

Members of staff who are involved in the CDM project will be given training on the CDM and reporting requirements, prior to registration of the project. New members of staff joining the CDM project team will also be given training in relation to their responsibilities. Full training procedures and a training plan will be detailed in the CDM Manual.

4.2 Record Keeping and Internal Reporting Procedure

The data associated with power generation and heat generation from proposed project will be measured continuously and automatically by the Distributed Control System (hereafter referred as the DCS) of the plant. Data will be recorded, collected, and archived every month by the CDM workgroup. Data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

The data associated with biomass collection, consumption, transportation as well as diesel consumption, on-site electricity will be recorded in operational log books. Data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

4.3 Error Handling Procedure

In the event that a meter has lost calibration over the allowable error limit then this shall be corrected at the earliest opportunity and re-calibrated and the data recorded from this meter since the last successful calibration shall be ignored.

In the event that there is uncertainty over the accuracy of the data, the conservative way to determine the data would be used.

The check of the CDM Project manager and then the third party verifier prior to issuance of the CERs is considered adequate for errors in the calculations. Where errors in the calculations are discovered by either of these Parties, the monitoring report shall be modified and the corrected version shall be resubmitted to the verifier.

4.4 External Reporting Procedure

After signing by the CDM Project manager, the report is sent to the 3rd party verifier who is contracted to verify the emissions reductions during the crediting period of the project.

4.5 Procedure for corrective actions arising

The CDM Project Director is responsible for identifying corrective actions arising from the above procedures and for liaising with the purchaser, the 3rd party verifiers and other stakeholders to take necessary steps to implement the corrective actions.

4.6 Emergency procedures

In the unlikely event of an emergency, set procedures will be followed. Details of the procedures to be followed are described in the relevant Operation Manuals. The key points include:

- The DCS will automatically shut off the boilers upon detecting an emergency.
- The operators can also remotely shut off the boilers if they find an emergency situation has occurred.

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

>>

Date of completion: 05/01/ 2008

Name of persons determining the baseline study and monitoring methodology:

Contact Information of the responsible person	**Is organisation a Project Participant *Yes/No***
Sun Li, Gong Jing, Liu Yanan Camco International Limited Floor 14, Lucky Tower A, No. 3 North Road, East 3rd Ring Road, Chaoyang District, Beijing, China 100027 Tel: (86 10) 8448 1623 Fax: (86 10) 8448 2432 email: lilian.sun@camcoglobal.com.cn kerry.gong@camcoglobal.com.cn melody.liu@camcoglobal.com.cn Website: www.camcoglobal.com.cn	Yes

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:

>>
06/11/2007 (Key Equipment Purchase Contract Signed Date, the construction begin date is 12/05/2008)

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

>>
20 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:

>>
01/07/2009

C.2.1.2. Length of the first crediting period:

>>
7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not applicable

C.2.2.2. Length:

>>
Not applicable

SECTION D. Environmental impacts

>>

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

The EIA of the proposed project was completed by Nanjing Environmental Insititute, Ministry of Environmental Protection approved by Jiangsu Environmental Protection bureau. The summary of this evaluation is as following:

1. Air

In the construction period, the waste gas resource is mainly from, such as the road dust during the transporting process, automobile emission, emissions from excavator and bulldozer, and so on. Some measures will be taken to reduce these negative effects: sprinkling to repress the dust, keep the ground humidity, and clear the soil daggered out in time.

After the project being implemented, there will be waste gas from the boiler. Then, the boiler waste gas will be treated by the bag filter, the dust removal efficiency of which is higher than 99.8%. Furthermore, the waste gas will be out though the high chimney (100m height, 2.5m internal diameter) to reduce the air pollution by the air diffusion and self-clean ability.

2. Waste Water

During construction, the waste water is mainly from: rainwater, wash water from all kinds of machinery and automobiles, and domestic wastewater. The wash water mainly contains the suspended sediment, and it will be collected by a simple drain, filter by grid, and then recovery and utilization after sedimentation. The domestic wastewater will be transmissioned by engineer sewage pipe network to the domestic sewage integration treatment equipment for treating.

When the project is operated, all kinds of waste water will be treated separately and reused after reach discharge standard: (1) acid-alkali wastewater will be neutralized and then reused as industrial water; (2) Oily wastewater will be separated the oil and water by the oil-water separator and then reused as industrial water; (3) Waste water from boiler and other clean system will be regulated PH, and then flocculated, clarified and then reused as industrial water; (4) The domestic waster water will be pretreated and then transmit into the industrial park sewage pipe network.

3. Noise

During construction, the project noise is mainly from: fixed and successive drilling, construction machinery noise, and fluid traffic noise. Generally, their noisy can be controlled between 80~110dB . According to the investigation to the environmental conditions in the neighboring region, there is no sound sensitive point around the project site, so the noise impact is not significant.

When the project is operated, the noise source is mainly from machinery noise and gas dynamic noise from the exhaust pipe. The noise control measures include: choosing the equipments with high efficiency and little noise, taking vibration reduction measures when fixing equipments,

taking sound proof measures to the noisy equipments, to control the noise in the standard range.

4. Solid Waste

The solid waste produced in the construction period is mainly the construction residues and the domestic waste from workers. The construction residues will be backfilled the site, and the domestic waste will be collected and sent to local environmental protection department for treatment.

During project operation, the solid waste is mainly: boiler ash residues, domestic waste, which are all common solid waste. The ash residues will be separated from the boiler by a clear system, and then transported for comprehensive utilization. The project owner has signed an agreement with Suqian Agricultural Bureau to reuse the ash residues. Both of them are responsible for collecting the ash residues for producing compound fertilizer. The domestic waste produce by this project is not so much, about 34t/a, and will be collected by the local environmental protection department for land filling.

5. Conclusion

After the above measurements performed, the negative impacts on environments will be minimized below the requirements of laws and regulations during the construction and implementation. Furthermore, as renewable power project, the proposed project can reduce the consumption of fossil fuel sources and GHG emission.

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:

>>

According to EIA, no significant environmental impacts are discovered by the project participants or the host party. Jiangsu Environmental Protection Bureau has approved the EIA in Oct., 23th, 2007.

SECTION E. Stakeholders' comments

>>

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

There are two ways utilized to invite the local stakeholders to give comments:

(1) By websites and posters
A summary of the project's introduction, EIA , questionnaires, contact information of the project was published on the website of the People's Government of Suqian City and the Administration office of Suqian Industry Area near the project site to invite the local stakeholder to give comments on the project during the EIA report compiling period.

(2) By questionnaires
In Jul., 2007, the project owner carried out the stakeholder comments investigation together with EIA organization in the neighboring area. The interviewees include the farmer, worker, official and other different occupation persons covering different age levels. Questionnaire was implemented by filling the stakeholder comments investigation form. 100 copies questionnaires were distributed and 98 of them were collected.
The basic information about the interviewee is described as following table:

Table E-1 Interviewee Statistics

Basic information	Classified items	Person number	Percentage（%）
Age	between 20 to 30 years old	4	4%
	between 30 to 40 years old	26	27%
	between 40 to 50 years old	60	61%
	older than 50 years old	8	8%
Occupation	Farmers	63	16%
	Workers	15	64%
	Officials	8	8%
	Teachers	4	4%
	Others	8	8%
Gender	Male	76	78%
	Female	22	22%
Education	Elementary school and below	3	3%
	Junior middle school	84	86%
	Senior middle school	9	9%
	Colleage and above	2	2%

The questions in the questionnaire including:

Are you familiar with the proposed project?
Are you satisfied with environmental quality status in the local area?
What is the environmental problem associated with the project that you are most concerned about?
What is the effect of the project on local ecologic environment?
Do you agree with the construction of the project?

E.2. Summary of the comments received:

>>

Among them, 37% interviewees are familiar with the proposed projects totally, 41% know partly, and 22% are not familiar. 44% are satisfied with the environmental quality status in the local area very much, 56% are satisfied, and none of them are not satisfied. 29% are most concerned about the air pollution, 31% think it's water pollution, 11% think noisy, 17% solid waste and 12% think no significant environmental problem. 59% of them think there is no impact on local ecologic environment, 39% think a little impact, 2% of them think it have some impacts on the environment, so none of them think there is no significant on the environment.

All of the interviees support the construction of the proposed project, and no negative suggestions were received.

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

>>

The residents and local government are all very supportive to the proposed project. No negative comments have been received on the project. However, there are few persons who express some concerns about environment. In fact, the proposed project is a renewable energy utilization project, and it has taken a serious consideration about the environmental problems. The Feasibility Study Report has supplied many specific measures and they are feasible through the technical and economical analysis. Furthermore, EIA has demonstrated that there is no significant impact on environment and also supplied many pollution treatment measures. So if these actions are effectively implemented, the environmental impacts can be easily controlled in an acceptable range.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Suqian Kaidi Green Energy Development Co., Ltd.
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URL:	
Represented by:	Jiang Song
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Salutation:	Mr.
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Middle Name:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding in the project activity.

Annex 3

BASELINE INFORMATION

According to the approved methodology ACM0002 and the document "China's Regional Grid Baseline Emission Factors Renewed", released at http://cdm.ccchina.gov.cn/ on 18 July 2008, the $EF_{grid,CM,y}$, $EF_{grid,OM,y}$, and $EF_{grid,BM,y}$ of East China Power Grid could be calculated as following:

A. Electricity Generation of East China Power Grid (2002-2006)

Table A1. Electricity Generation of East China Power Grid (2002-2006)

Year	Electricity Generation (Unit：10^8 KWh)					Split of low-cost/must-run resources
	Total	Hydro	Thermal	nuclear	Others	
2002	3698.13	378.35	3242.04	56.12	1.63	12.33%
2003	4291.27	319.82	3821.12	149.24	1.09	10.96%
2004	4879.86	255.56	4402.92	219.88	1.50	9.77%
2005	5744.67	441.87	5058.55	226.12	18.13	11.94%
2006	6668.20	502.65	5905.41	236.30	23.84	11.44%

Sources: China Electric Power Yearbook 2003-2007

B. Calculation of Operating Margin Emission Factor ($EF_{grid,OM,y}$)

Table B1. Electricity Generation of East China Power Grid in 2004

	Electricity generation of fuel-fired power plants (MWh)	Auxiliary power ratio (%)	Total Electricity Supplied to the Grid (MWh)
Shanghai	71127000	5.22	67,414,171
Jiangsu	163545000	5.93	153,846,782
Zhejiang	95255000	5.68	89,844,516
Anhui	59875000	6.03	56,264,538
Fujian	50490000	6.07	47,425,257
Total			414,795,263

Sources: China Electric Power Yearbook 2005

Table B2. Electricity Generation of East China Power Grid in 2005

	Electricity generation of fuel-fired power plants (MWh)	Auxiliary power ratio (%)	Total Electricity Supplied to the Grid (MWh)
Shanghai	74606000	5.05	70,838,397
Jiangsu	211429000	5.96	198,827,832
Zhejiang	108110000	5.59	102,066,651
Anhui	62918000	5.9	59,205,838
Fujian	48600000	4.57	46,378,980
Total			477,317,698

Sources: China Electric Power Yearbook 2006

Table B3. Electricity Generation of East China Power Grid in 2006

	Electricity generation of fuel-fired power plants (MWh)	Auxiliary power ratio (%)	Total Electricity Supplied to the Grid (MWh)
Shanghai	72033000	5.06	68,388,130
Jiangsu	251258000	5.69	236,961,420
Zhejiang	140349000	5.62	132,461,386
Anhui	71867000	6.05	67,519,047
Fujian	55580000	4.51	53,073,342
Total			558,403,325

Sources: China Electric Power Yearbook 2007; China Energy Statistical Yearbook 2007

Table B4. Calculation of Operating Margin Emission Factor of East China Power Grid in 2004

Fuel	Unit	Shanghai A	Jiangsu B	Zhejiang C	Anhui D	Fujian E	Total F=A+B+C+D+E	Emission Factor[1] (tC/TJ) G	Oxidation[2] (%) H	Average Low Caloric Value[3] (MJ/t or km^3) I	CO_2 Emission (tCO_2e) J=G*H*I*F*44/12/1000 (mass) J=G*H*I*F*44/12/1000 (Volume)
Raw Coal	10^4t	2779.6	7601.9	4008.9	2906.2	2183.7	**19480.3**	25.8	100	20908	385,300,230
Cleaned coal	10^4t						**0**	25.8	100	26344	0
Other Washed Coal	10^4t		5.46			4.63	**10.09**	25.8	100	8363	79,826
Coke	10^4t						**0**	29.2	100	28435	0
Coke Oven Gas	10^8m^3	2.59					**2.59**	12.1	100	16726	192,198
Other Gas	10^8m^3	72.46					**72.46**	12.1	100	5227	1,680,380
Crude Oil	10^4t						**0**	20	100	41816	0
Gasoline	10^4t						**0**	18.9	100	43070	0
Diesel Oil	10^4t	2.69	27.17	6.23			**36.09**	20.2	100	42652	1,140,116
Fuel Oil	10^4t	58.52	55.07	202.89		23.26	**339.74**	21.1	100	41816	10,991,148
PLG	10^4t						**0**	17.2	100	50179	0
Refinery Gas	10^4t	0.77	0.55				**1.32**	15.7	100	46055	34,996
Natural Gas	10^8m^3		0.14				**0.14**	15.3	100	38931	30,576
Other Petroleum Products	10^4t	21.22	1.37	24.89			**47.48**	20	100	38369	1,335,957
Other Coking Products	10^4t						**0**	25.8	100	28435	0
Other Energy	10^4t tce	6.43		15.48			**21.91**	0	100	0	0
											Total CO_2 Emission : 400,785,429

Net electricity imported from Yangcheng, Shanxi Province (MWh)	**11,649,610**
Net electricity imported from Central China Grid (MWh)	**26,933,850**
Total emission of the East China Power Grid(tCO_2e)	**436,037,347**
Fossil power supply of the East China Power Grid(MWh)	**453,378,723**
OM emission factor of the East China Power Grid(tCO_2e/MWh)	**0.96175**

Sources: China Electric Power Yearbook 2005

1,2 2006 IPCC Guidelines for National Greenhouse Gas Inventories， Volume 2 Energy, chapter 1, page 1.21-1.24, table 1.3 and 1.4.

3 China Energy Statistical Yearbook 2007,Page 287

Table B5. Calculation of Operating Margin Emission Factor of East China Power Grid in 2005

Fuel	Unit	Shanghai A	Jiangsu B	Zhejiang C	Anhui D	Fujian E	Total F=A+B+C+D+E	Emission Factor[1] (tC/TJ) G	Oxidation[2] (%) H	Average Low Caloric Value[3] (MJ/t or km^3) I	CO_2 Emission (tCO_2e) J=G*H*I*F*44/12/1000 (mass) J=G*H*I*F*44/12/1000 (Volume)
Raw Coal	10^4t	2847.31	9888.06	4801.52	3082.9	2107.69	**22727.48**	25.8	100	20908	449,526,100
Cleaned coal	10^4t						**0**	25.8	100	26344	0
Other Washed Coal	10^4t						**0**	25.8	100	8363	0
Coke	10^4t			0.03			**0.03**	29.2	100	28435	913
Coke Oven Gas	10^8m^3	1.68	1.38		1.71		**4.77**	12.1	100	16726	353,971
Other Gas	10^8m^3	83.72	24.97	0.06	30		**138.75**	12.1	100	5227	3,217,676
Crude Oil	10^4t			27.01			**27.01**	20	100	41816	828,263
Gasoline	10^4t						**0**	18.9	100	43070	0
Diesel Oil	10^4t	1.25	16	4.52		1.67	**23.44**	20.2	100	42652	740,491
Fuel Oil	10^4t	59.39	13.22	153.22		7.45	**233.28**	21.1	100	41816	7,546,992
PLG	10^4t						**0**	17.2	100	50179	0
Refinery Gas	10^4t	0.57	0.83				**1.4**	15.7	100	46055	37,117
Natural Gas	10^8m^3	1.09	1.85	0.62			**3.56**	15.3	100	38931	777,514
Other Petroleum Products	10^4t	21	8.38	34.8			**64.18**	20	100	38369	1,805,850
Other Coking Products	10^4t						**0**	25.8	100	28435	0
Other Energy	10^4t tce	12.36		15.29			**27.65**	0	100	0	0
Total CO_2 Emission : 464,834,887											
Net electricity imported from Yangcheng, Shanxi Province (MWh)								**11,282,000**			
Net electricity imported from Central China Grid (MWh)								**27,039,000**			
Total emission of the East China Power Grid(tCO_2e)								**498,646,318**			
Fossil power supply of the East China Power Grid(MWh)								**515,638,698**			
OM emission factor of the East China Power Grid(tCO_2e/MWh)								**0.96705**			

Sources: China Electric Power Yearbook 2006

Table B6. Calculation of Operating Margin Emission Factor of East China Power Grid in 2006

Fuel	Unit	Shanghai A	Jiangsu B	Zhejiang C	Anhui D	Fujian E	Total F=A+B+C+D+E	Emission Factor[1] (tC/TJ) G	Oxidation[2] (%) H	Average Low Calorific Value[3] (MJ/t or km^3) I	CO_2 Emission (tCO_2e) J=G*H*I*F*44/12/1000 (mass) J=G*H*I*F*44/12/1000 (Volume)
Raw Coal	10^4t	2744.45	10945.42	6065	3455.2	2369.63	**25579.7**	25.8	100	20908	505,940,068
Cleaned coal	10^4t						**0**	25.8	100	26344	0
Other Washed Coal	10^4t		150.54		23.06		**173.6**	25.8	100	8363	1,373,419
Coke	10^4t			39.07			**39.07**	29.2	100	28435	1,189,463
Coke Oven Gas	10^8m^3	1.71	3.13	0.23	0.71		**5.78**	12.1	100	16726	428,920
Other Gas	10^8m^3	84.64	106.54	3.28	25.12		**219.58**	12.1	100	5227	5,092,160
Crude Oil	10^4t			20.3			**20.3**	20	100	41816	622,501
Gasoline	10^4t						**0**	18.9	100	43070	0
Diesel Oil	10^4t	2.13	3.7	4.11	1.21	1.11	**12.26**	20.2	100	42652	387,305
Fuel Oil	10^4t	44.51	3.77	71.98	0.02	4.5	**124.78**	21.1	100	41816	4,036,838
PLG	10^4t						**0**	17.2	100	50179	0
Refinery Gas	10^4t	0.29	0.4		2.95		**3.64**	15.7	100	46055	96,505
Natural Gas	10^8m^3	3.2	13.5	9.18			**25.88**	15.3	100	38931	5,652,267
Other Petroleum Products	10^4t	18.82	3.57				**22.39**	20	100	38369	629,993
Other Coking Products	10^4t						**0**	25.8	100	28435	0
Other Energy	10^4t tce	6.66	2.8	27.45	3.21		**40.12**	0	100	0	0
											Total CO_2 Emission : 525,449,440

Net electricity imported from Yangcheng, Shanxi Province (MWh)	**11,150,820**
Net electricity imported from Central China Grid (MWh)	**24,029,150**
Total emission of the East China Power Grid(tCO_2e)	**555,969,044**
Fossil power supply of the East China Power Grid(MWh)	**593,583,295**
OM emission factor of the East China Power Grid(tCO_2e/MWh)	**0.93663**

Sources: China Electric Power Yearbook 2007; China Energy Statistic Yearbook 2007

Table B7. Weighted-average OM emission factor of East China Power Grid (2004-2006)

	2004	2005	2006	Weighted-average OM emission factor
Total Emission, tCO2	436,037,347	498,646,318	555,969,044	
Total power supply, MWh	453,378,723	515,638,698	593,583,295	
OM emission factor, tCO2/MWh	0.96175	0.96705	0.93663	**0.95396**

Therefore, the $EF_{grid,OM,simple}$ could be calculated as:

$EF_{grid,OM,simple}$ =（436,037,347+ 498,646,318+ 555,969,044）/ (453,378,723 + 515,638,698 + 593,583,295) = **0.95396** tCO_2e/MWh

C. Calculation of the Build Margin Emission Factor ($EF_{grid,BM,y}$)

Table C1 Emission Factor of Best Technology

	Variable	Electricity supply efficiency	Emission factor of fuel (tC/TJ)	Oxidation rate	Emission factor (tCO_2/MWh)
		A	B	C	D=3.6/A/1000*B*C*44/12
Coal-based power plants	$EF_{Coal,Adv}$	37.28%	25.8	1	0.9135
Gas-based power plants	$EF_{Gas,Adv}$	48.81%	15.3	1	0.4138
Oil-based power plants	$EF_{Oil,Adv}$	48.81%	21.1	1	0.5706

Sources: China's grid baseline BM calculation progress, NRDC

Table C2 The Proportion Of CO_2 Emission From Solid、Liquid、Gas Fuel For Generating Electricity

Fuel	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total	Caloric	Emission	Oxidatio	Emission
		A	B	C	D	E	F=A+…+E	G (KJ/kg)	H	I	J=F*G*H*I*44/12/100
Raw Coal	10^4 t	2744.45	6065	10945.4	3455.2	2369.63	25579.7	20908	25.8	1	505,940,068
Cleaned Coal	10^4 t	0	0	0	0	0	0	26344	25.8	1	0
Other Washed	10^4 t	0	0	150.54	23.06	0	173.6	8363	25.8	1	1,373,419
Briquette	10^4 t	0	0	0		0	0	20908	26.6	1	0
Coke	10^4 t	0	39.07	0	0	0	39.07	28435	29.2	1	1,189,463
Subtotal											**508,502,949**
Crude Oil	10^4 t	0	20.3	0	0	0	20.3	41816	20	1	622,501
Gasoline	10^4 t	0	0	0	0	0	0	43070	18.9	1	0
Kerosene	10^4 t	0	0	0	0	0	0	43070	19.6	1	0
Diesel Oil	10^4 t	2.13	4.11	3.7	1.21	1.11	12.26	42652	20.2	1	387,305
Fuel Oil	10^4 t	44.51	71.98	3.77	0.02	4.5	124.78	41816	21.1	1	4,036,838
Other Petroleum	10^4 t	18.82	0	3.57	0	0	22.39	38369	20	1	629,993
Other Coking	10^4 t	0	0	0			0	28435	25.8	1	0
Subtotal											**5,676,637**
Natural Gas	10^7 m^3	32	91.8	135	0	0	258.8	38931	15.3	1	5,652,267
Coke Oven Gas	10^7 m^3	17.1	2.3	31.3	7.1	0	57.8	16726	12.1	1	428,920
Other Gas	10^7 m^3	846.4	32.8	1065.4	251.2	0	2195.8	5227	12.1	1	5,092,160
PLG	10^4 t	0	0	0	0	0	0	50179	17.2	1	0
Refinery Gas	10^4 t	0.29	0	0.4	2.95	0	3.64	46055	15.7	1	96,505
Subtotal											**11,269,853**
Total											**525,449,440**

Sources: China Energy Statistical Yearbook 2007

Calculate with relevant data and formulae, the value for λ_{Coal} is 96.78%the value for λ_{Oil} is 1.08% and the value for λ_{Gas} is 2.14%.
Therefore,
$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal,Adv} + \lambda_{Oil} \times EF_{Oil,Adv} + \lambda_{Gas} \times EF_{Gas,Adv}$ =0.8991 tCO_2e/MWh.

Table C3 Installed capacity of the East China Power Grid in 2004

Installed Capacity	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fuel-fired	MW	12014.9	28289.5	21439.8	9364.5	8315.4	79424.1
Hydro	MW	0	126.5	6418.4	692.8	7180.1	14417.8
Nuclear	MW	0	0	3056	0	0	3056
Wind & Others	MW	3.4	17.5	39.7	0	12	72.6
Total	MW	12018.3	28433.5	30953.9	10057.3	15507.5	96970.5

Sources：China Electric Power Yearbook 2005

Table C4 Installed capacity of the East China Power Grid in 2005

Installed Capacity	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fuel-fired	MW	13113.5	42506.4	27688.1	11423.2	9345.4	104076.6
Hydro	MW	0	142.6	6952.1	749.8	8224.9	16069.4
Nuclear	MW	0	0	3066	0	0	3066
Wind & Others	MW	253.3	58.8	37.2	0	52	401.3
Total	MW	13366.8	42707.8	37743.4	12173	17622.3	123613.3

Sources：China Electric Power Yearbook 2006

Table C5 Installed capacity of the East China Power Grid in 2006

Installed Capacity	Unit	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Total
Fuel-fired	MW	14526	51776	35391	14134	13001	128828
Hydro	MW	0	136	8369	1001	8957	18463
Nuclear	MW	0	0	3066	0	0	3066
Wind & Others	MW	253	162	43	0	89	547
Total	MW	14550	51927	46863	15135	22047	150522

Sources：China Electric Power Yearbook 2007

Table C6. Calculation of BM Emission Factor of East China Power Grid (2004-2006)

	New Capacity 2004	New Capacity 2005	New Capacity 2006	New Capacity 2005-2006	Percentage of New Capacity Additions

	A	B	C	D=C-B	
Fuel-fired (MW)	79424.1	104076.6	128828	24751.4	90.70%
Hydro (MW)	14417.8	16069.4	18463	2393.6	8.77%
Nuclear (MW)	3056	3066	3066	0	0.00%
Wind and others(MW)	72.6	401.3	547	145.7	0.53%
Total	96970.5	123613.3	150904	27290.7	100.00%
Percentage of Year 2006	64.26%	81.92%	100%	–	–

$EF_{grid,BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal}$ =0.8991×90.70%=0.8154 tCO_2/MWh。

D．Calculation of the Baseline Emission Factor （$EF_{grid,CM,y}$）

$EF_{grid,CM,y}$ = 0.5 × 0.9540 + 0.5 × 0.8154 = 0.8847 tCO_2/MWh

Annex 4

MONITORING INFORMATION

No Supplement Information.