

B.7 Application of the monitoring methodology and description of the monitoring plan:
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B.7.1 Data and parameters monitored:

Data / Parameter:	EGy
Data unit:	MWh
Description:	Annual electricity delivered to the grid by the proposed project
Source of data to be used:	Electricity meter
Value of data applied for the purpose of calculating expected emission reductions in section B.5	126,500 MWh
Description of measurement methods and procedures to be applied:	This parameter will be hourly measured and monthly recorded. The relevant data will be kept during the crediting period and two years after. The electricity meter will be operated by the power distribution company and adjusted according to relevant national standard including “Technical administrative code of electric energy metering” DL/T 448-2000, “Verification regulation of electric energy metering appliance” SD 109-83, “Electricity Law”, “Metrology law of the PR China”. The accuracy of the metering equipment is 0.5s. The metering equipment will be calibrated annually. The net electricity delivered to the grid by the proposed project will be calculated as follows: $EGy = A - A' - B$, where A is the electricity delivered to the grid by the unit of the proposed project, measured by main ammeters. A' is the electricity consumed by the units from the grid, also measured through ammeter. B is measured by an ammeter connected with an emergence line to measure the electricity consumed by the proposed projects in case of emergence.
QA/QC procedures to be applied:	The data is monitored through the ammeter, and rechecked by comparing with the electricity sales receipt from power corporation monthly.
Any comment:	

Data / Parameter:	BF _{k,y}
Data unit:	tons
Description:	Quantity of biomass residue type <i>k</i> combusted in the project plant during the year <i>y</i>
Source of data to be used:	Power plant and the department who is responsible for the biomass residue collection and transportation.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	k=c and 123,100 tons
Description of measurement methods and procedures to be	The electrical weight (SCS/ZCS Electrical Weight) will be operated by staffs appointed by the project company to be responsible for the record and monitor of biomass residue purchased and consumed in the project plant, and build straws

applied:	account rechecked by comparing with the purchase receipt and stock change record. The record will be reported and documented monthly. The electrical weight will be calibrated annually according to related national standards (JJG555-96, or JJG539-1997, or JJG14-1997, or JJG13-1997 etc). The accuracy of weight will be class of III, or be subject to the above national standards.
QA/QC procedures to be applied:	The amount of biomass residue consumed will be recorded continuously and crosschecked by an annual energy balance that is based on purchased quantities and stock changes.
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	10%, From FSR
Description of measurement methods and procedures to be applied:	The moisture should be measured continuously and mean values will be calculated at least annually. The instrument is portable hay moisture tester.
QA/QC procedures to be applied:	Three samples should be analyzed at the same time and reported. And the average of moisture content of these samples should be used. The measurement type is HMT2 and the accuracy is class of 5.0, or should be subject to consist with related national standards.
Any comment:	

Data / Parameter:	FF _{project, plant, d, y}
Data unit:	Tons
Description:	Quantity of diesel combusted in the straw-fired boiler during the year y
Source of data to be used:	Power plant
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 build diesel account for each boiler and will be reported and documented monthly.
QA/QC procedures to	The amount of diesel consumed will be recorded monthly and crosschecked by

be applied:	an annual energy balance that is based on purchased quantities and stock changes.
Any comment:	

Data / Parameter:	FF _{project,site,d,y}
Data unit:	Tons
Description:	Quantity of diesel combusted in the straw forklift during the year y
Source of data to be used:	Power plant and straw brokers
Value of data applied for the purpose of calculating expected emission reductions in section B.5	24
Description of measurement methods and procedures to be applied:	The power plant will collect diesel purchase receipt from fuel station and will document these data monthly. The quantity of diesel combusted is equal to the quantity of stock at the start of the year plus the purchased amount and then minus the stock at the end of the year.
QA/QC procedures to be applied:	The amount of diesel consumed will be recorded monthly and crosschecked by an annual energy balance that is based on purchased quantities and stock changes of different straw brokers.
Any comment:	

Data / Parameter:	EC _{PJ,y}
Data unit:	MWh
Description:	On-site electricity consumption attributable to the project activity during the year y.
Source of data to be used:	Calculate
Value of data applied for the purpose of calculating expected emission reductions in section B.5	1231
Description of measurement methods and procedures to be applied:	This data will be calculated conservatively as the product 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) of every straw crackers, 2) calculating the electricity factor corresponding to each cracker which equals to power/capacity (in kWh/t), 3) using the largest number as a conservative electricity factor for the calculation.
QA/QC procedures to be applied:	Cross-check measurement results with invoices for purchased electricity if available.
Any comment:	

Data / Parameter:	AVD_v
Data unit:	km
Description:	Average round trip distance between biomass fuel supply sites and the project site
Source of data to be used:	Power plant and the department who is responsible for the straw collection and transportation.
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:	A staff will be appointed by the project company to be responsible for the record and monitor of recording average round trip for each trucks and the record will be reported and documented monthly.
QA/QC procedures to be applied:	Check consistency of distance records provided by the truckers by comparing recorded distances with other information from other sources (e.g. maps)
Any comment:	

Data / Parameter:	TL_v
Data unit:	Tons
Description:	Average truck load of the trucks used for transportation of biomass
Source of data to be used:	Power plant and the department who is responsible for the straw collection and transportation.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	1
Description of measurement methods and procedures to be applied:	A staff will be appointed by the project company to be responsible for the record of load for each trucks and the record will be reported and documented monthly.
QA/QC procedures to be applied:	Check consistency of load record with straws receipts.
Any comment:	

Data / Parameter:	DPK_v
Data unit:	L/km
Description:	The diesel consumption per km for the full-load truck in L/km
Source of data to be used:	Power plant and the department who is responsible for the straw collection and transportation.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.06
Description of	The DPK of each typical type of truck which will be used for straws

measurement methods and procedures to be applied:	transportation should be tested and recorded annually. The average DPK or nameplate DPK will be used for emission reduction calculation for conservative and simplification purpose.
QA/QC procedures to be applied:	This data should be tested and reported by qualified test institution with signature or tamped test report. The nameplate DPK also can be used for calculation. When using the tested data, at least three trucks should be tested for each major type and average value should be used in the ER calculation.
Any comment:	Only applicable when $EF_{km,CO_2,y}$ is calculated

Data / Parameter:	---
Data unit:	Tons
Description:	Quantity of available biomass residues of type k in the region
Source of data to be used:	Official surveys or statistics
Value of data applied for the purpose of calculating expected emission reductions in section B.5	845,000 from FSR
Description of measurement methods and procedures to be applied:	The data come from official information should be applied. If the data is not available, the calculation and estimation based on official information should be adopted. The quantity of surplus supply is the difference between available biomass and biomass used for other purposes than generation.
QA/QC procedures to be applied:	Uncertainty level of data is low, which can be rechecked by the planting area and output of cotton.
Any comment:	

Data / Parameter:	---
Data unit:	Tons
Description:	Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region.
Source of data to be used:	Official surveys or statistics
Value of data applied for the purpose of calculating expected emission reductions in section B.5	211,250
Description of measurement methods and procedures to be applied:	The data come from official information should be applied. If the data is not available, the calculation and estimation based on official information should be adopted. The quantity of surplus supply is the difference between available biomass and biomass used for other purposes than generation.
QA/QC procedures to be applied:	Uncertainty level of data is low, which can be rechecked by the planting area and output of cotton.
Any comment:	

Data / Parameter:	EF _{CH4,BF}
Data unit:	tCH4/TJ
Description:	CH4 emission factor for controlled burning of the straw.
Source of data to be used:	Version 04 of ACM0006
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.0411
Description of measurement methods and procedures to be applied:	This data will be collected from latest methodology or IPCC guidelines.
QA/QC procedures to be applied:	Uncertainty level of data is low,
Any comment:	

Data / Parameter:	EF _{km,CO2,y}
Data unit:	tCO ₂ /km
Description:	Average CO2 emission factor for the trucks during the year y.
Source of data to be used:	Conduct sample measurements of the fuel type, fuel consumption and distance traveled for all truck types. Calculate CO2 emissions from fuel consumption by multiplying with appropriate net calorific values and CO2 emission factors. For net calorific values and CO2 emission factors, use reliable national default values or, if not available, (country-specific) IPCC default values. See the previous three tables for detail. Alternatively, choose emission factors applicable for the truck types used from the literature in a conservative manner (i.e. the higher end within a plausible range).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.000159
Description of measurement methods and procedures to be applied:	Calculated by other parameters. This data will be calculated annually. Alternatively, choose emission factors applicable for the truck types used from the literature in a conservative manner (i.e. the higher end within a plausible range).
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	NCV _d
Data unit:	TJ/t
Description:	Net calorie value of diesel oil used for biomass residue transportation
Source of data to be	National default value

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.042652
Description of measurement methods and procedures to be applied:	The net calorific value of diesel oil should be collected from the latest China Energy Statistical Yearbook.
QA/QC procedures to be applied:	As a national specific value, the uncertainty is low.
Any comment:	

Data / Parameter:	NCV _i
Data unit:	TJ/t
Description:	Net calorific value of the fossil fuel type <i>i</i>
Source of data to be used:	National default value
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.042652 For on-site consumption of fossil fuels, except diesel, no other fossil fuel consumption during the startup and operation. Otherwise, the Net calorie value should be adopted.
Description of measurement methods and procedures to be applied:	The net calorific value of diesel fuels should be collected from the latest China Energy Statistical Yearbook.
QA/QC procedures to be applied:	As a national specific value, the uncertainty is low.
Any comment:	

Data / Parameter:	EF_d
Data unit:	tCO ₂ /TJ
Description:	Emission factor of diesel used for straws transportation and on-site fuel use
Source of data to be used:	IPCC default value
Value of data applied for the purpose of calculating expected emission reductions in section B.5	74.1
Description of measurement methods and procedures to be applied:	This data will be fixed or updated according to IPCC guidelines.
QA/QC procedures to be applied:	Uncertainty level of data is low,

Any comment:	
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Data / Parameter:	$EF_{\text{burning,CH}_4,k,y} * NCV_k$
Data unit:	tCH ₄ /t
Description:	CH ₄ emission factor for uncontrolled burning of the straw.
Source of data to be used:	Version 04 of ACM0006
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.001971 (This value will be fixed in the entire crediting period.)
Description of measurement methods and procedures to be applied:	This data will be fixed or updated according to IPCC guidelines.
QA/QC procedures to be applied:	Uncertainty level of data is low,
Any comment:	

Data / Parameter:	NCV _k
Data unit:	TJ/t
Description:	Net calorific value of biomass residue type <i>k</i> consumed by the proposed project
Source of data to be used:	Power plant and the department who is responsible for the biomass residue collection and transportation.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.01754
Description of measurement methods and procedures to be applied:	The net calorific value of biomass residues should be measured and reported by qualified test institution per six months. For each test, at least three samples should be measured and the average NCV should be used.
QA/QC procedures to be applied:	Three samples (dry matter) should be analyzed at the same time by the test institution and reported. And the average of NCV of these samples should be used in the emission reduction calculation. The analysis will be made every six months. In case the biomass residues are more than one type, NCV of all types of them should be tested.
Any comment:	

Data / parameter:	$EF_{\text{CO}_2,\text{LE}}$
Data unit:	tCO ₂ /GJ
Description:	CO ₂ emission factor of coal is the most carbon intensive fuel used in the country

Source of data to be used:	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: workbook”, Chapter 1, table 1-2.
Value of data applied for the purpose of calculating expected emission reductions in section B.5 Description of measurement methods and procedures to be applied:	0.092708 (coal) $25.8\text{tC/TJ} * 44/12\text{tCO}_2/\text{tC} * 0.001\text{TJ/GJ} * 0.98 = 0.092708 \text{ tCO}_2/\text{GJ}$ This data will be fixed or update according to IPCC guidelines..
QA/QC procedures to be applied:	Uncertainty level of data is low,
Any comment:	

Data / Parameter:	EF_{CO2,FF,i}
Data unit:	tCO ₂ /TJ
Description:	CO2 emission factor for fossil fuel type i
Source of data to be used:	IPCC default value
Value of data applied for the purpose of calculating expected emission reductions in section B.5 Description of measurement methods and procedures to be applied:	74.1 This data will be collected from latest methodology or IPCC guidelines.
QA/QC procedures to be applied:	Uncertainty level of data is low,
Any comment:	

B.7.2 Description of the monitoring plan¹:

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The proposed project adopted the approved baseline methodology Version 04 of ACM0006: Consolidated baseline methodology for grid-connected electricity generation from biomass residues. According to the description in B.7, the relative monitoring methodology Version 04 of ACM0006 is adopted, which is consolidated monitoring methodology for grid-connected electricity generation from biomass residues.

1. The requirements of monitoring plan

The project owner should build up a monitoring system. The system should be able to estimate, measure, collect and track data. When the emission abatement is verified by DOE, the system can show the monitoring process and supply the credible, transparent and true results. It ensures that the carbon dioxide emission abatement is verified to the CERS buyers.

The proposed project substitutes some electricity generated by general fossil fuels, and avoids the relative carbon dioxide emission. So the electricity amount supplying to grid is the key data what should be monitored. Besides the electricity amount, all the data relative to baseline emission, emission by the proposed project and leakage should be monitored.

2. Principal of the monitoring plan

The proposed project owner is responsible the monitoring plan. Moreover some relative people are needed. The project owner should appoint a Chinese CDM project director and a monitoring manager. Their respective responsibilities are as follows:

Chinese CDM project director: Receive the report from monitoring manager; manage the CDM project jointly with CERs buyer; Coordinate with the Chinese Government and stakeholders; submit the monitoring report to DOE and deliver to CERs.

Monitoring manager: Based on monitoring manual guideline, records the net electricity supplied monthly and aggregately annually, prepares the monitoring report, etc. Monitoring manager is responsible to the Chinese CDM project director.

The two managers should audit interior reports regularly in order to offer high quality data. The audit interiorly is helpful to find some operational false and adjust in time.

If one person changes his work in project life-time, the new must be qualified and be trained before going to post.

In case deviations in the monitoring data are found, the Monitoring manager should study the operating parameters to identify the reason for the deviation and take remedial measures.

Monitoring report will be prepared by the monitoring manager and submit to Chinese CDM project director for final review, who will submit the report to the DOE.

3. Meters installation

The meters installed at transformer substation are used to monitor net electricity delivered to the grid. There are two systems for meters operation and maintenance. One is hold by ECPG, the other is hold by project owner. The two instruments system can record data from long distance and record accumulated electricity amount. The two sides have the right to record the two meters data. ECPG should provide the main meters system data to the project owner every month.

The meters are installed as following figure. They can record the electricity amount from two directions. They are 0.2S level. Once the project activities are halted, the grid will supply electricity to the plant. The electricity amount is also record in the same two meters.

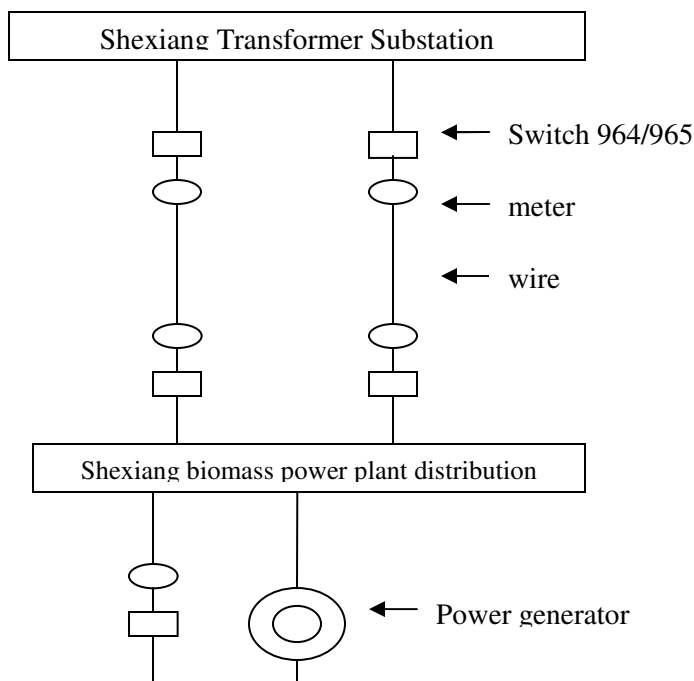


Figure: The meters recording electricity amount are installed as demonstration

4. Calibration and measure

The project owner will sign an agreement with ECPG, which stipulate the process of quality control in measure and calibration in order to make the data more precise.

The meters should be enough precise so that any error using these meters is not larger than +0.2% of the whole scale.

The two meters installed system should be inspected and enclosed by project owner and ECPG.

The calibration is implemented by ECPG, and the relative record should provide to project owner. These records are holds by Project Owner or the appointed third side.

5. Monitoring

The monitoring plan will supervise the following data:

5.1 straw weight and humidity

The trucks conveying straws should be weighted every time. The humidity instrument is also used to measure straw.

5.2 electricity delivered

Power delivered to grid is measured by the meter installed in transformer substation, is also onsite measured and recorded by computer system at control centre.

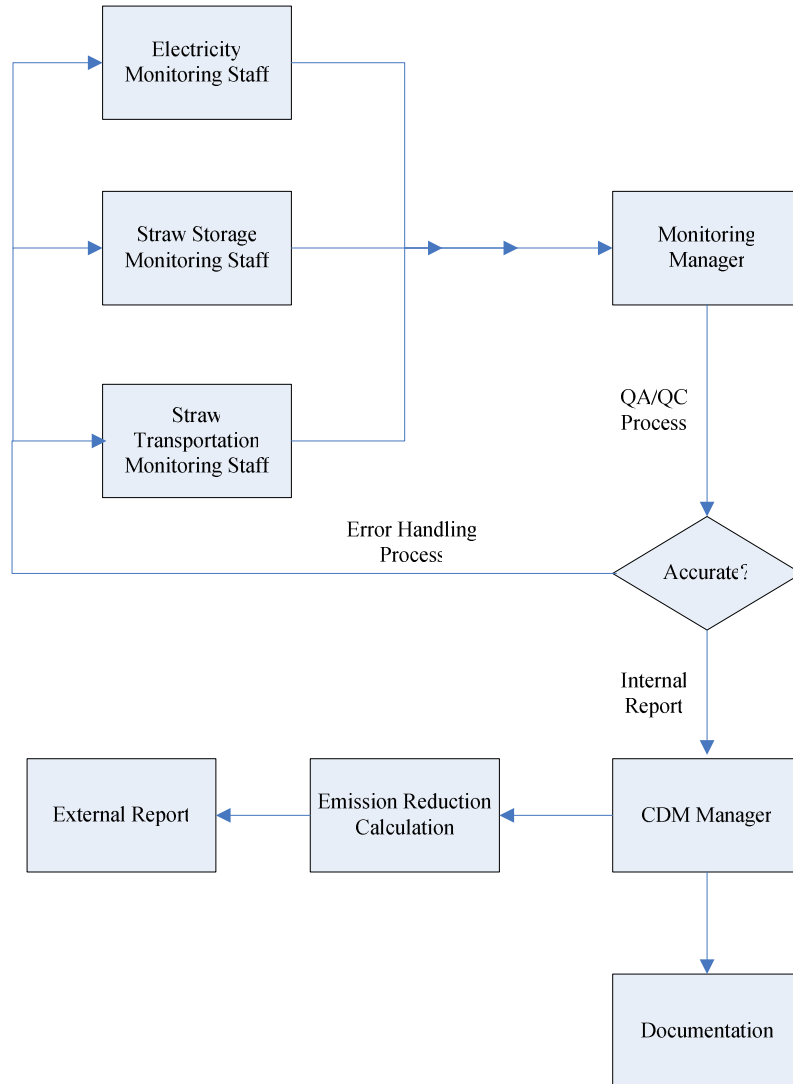
It should ensure DOE to gain conveniently the records of meters and calibration records.

5.3 quality ensure and quality control

The quality assurance and quality control for data records, maintenance and document should revised and improved according to the requirements of CDM project and the actually operation.

As B.7.1, the net electricity output will be continually measured and monthly recorded which will be rechecked by electricity sale invoice. Record frequency for other data could be found in B.7.1

This monitoring plan will be implemented by professional staff authorized by the project sponsor. The management structure is illustrated as follows:



6. Disposal of urgency

If the fossil fuel is needed, the species and amount of the fossil fuel should be recorded in detail. The leakage led by this scenario should be calculated precisely and clearly.

7. Data management system

The proposed system is used to collect the data from monitoring process and keep them in paper archives and in the electric archives.

All the information and data collected in the whole process should be kept in archives with paper documents and in the electric archives, from original data source to final calculation data. These relevant data should be kept during the crediting period and two years later. Some hand recorded

data should be also kept.

If the DOE asks some requirements in verification, the project owner has the responsibility to provide extra and necessary data to DOE in time.

8 verification

The verification is a necessary part of all CDM projects. The main object of verification is to check independently the PDD report finished and greenhouse gas emission abatement estimated. The frequency of verification is one time per year.

A person especially assigned by the project owner for contact with DOE will be charge of monitoring and verification.