

VER Monitoring Report

Project Activity Title:	Gansu Huanghe Bingling Hydropower Station Project
UNFCCC Registration Number:	1985
Date of registration:	12/02/2009
Monitoring Period:	04 Aug. 2008 - 11 Feb. 2009
Report Version:	2.0
Completion date:	21/12/2009
Project developer:	Gansu Diantou Bingling Hydropower Development Co., Ltd.

1. General description and implementation status of the project

The Gansu Huanghe Bingling Hydropower Station Project locates at the main stream of the Yellow River at the border of Yongjing County and Jishishan County of Linxia Hui Autonomous Prefecture in Gansu Province, China. It connects to North West China Power Grid with capacity of 240MW.

A more detailed description is available in the PDD.

The main construction activities of this project started in November 2004. During this monitoring period 3 units of turbine-generator became operational, respectively in August 2008, November 2008 and January 2009. The project was normally operated without any emergency event. The net power supply during this period is 167,225.526 MWh.

2. Monitoring methodology and plan

2.1 Monitoring methodology

Approved consolidated baseline and monitoring methodology ACM0002 (Version 6): "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources".

2.2 Monitoring plan

In accordance with the methodology ACM0002 (version 6) and registered PDD, the following parameters are monitored:

Table 1. Monitored parameters

ID	Data variable	Data unit	Recording frequency	Measured (m) calculated (c) estimated (e)
EG_y	Net electricity supplied to the grid by the project	MWh	Hourly measurement and monthly recording	Calculated
Surface area reservoir	Surface area at full reservoir level	m ²	At start of the project	Measured
Operational hours of emergency back-up diesel generator	Annual hours that the emergency back-up diesel generator is running either for the purpose of commissioning/maintenance or actual emergencies	Hours / year	Once used	Estimated

EG_y was monitored by both project entity at project site and grid company at the grid side:

The electricity supplied to the grid and the electricity imported from the grid through the two main lines (Line 1 and Line 2) were hourly measured by the project entity with two bidirectional meters M2a and M2b installed at the project site. They were also measured by two bidirectional meters M3a and M3b installed at the grid side. Besides, the electricity imported from the grid is also imported from a back-up power line which was hourly measured by the project company with the meter M4 installed at the project site and by the grid company with the meter M5 installed at grid side. The above data were recorded monthly by the project entity and then were used to calculate EG_y.

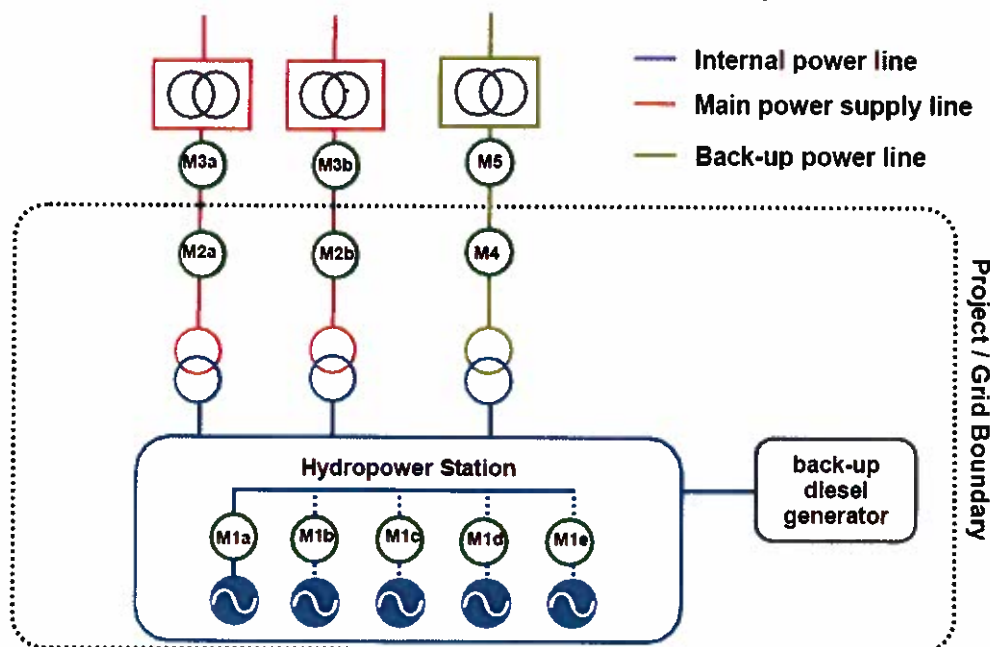
The grid company settled the power supply to the grid from the project as well as power imported by the project from the grid on sales receipts or statements and these electricity sold records were given to the project entity each month to cross check.

The reservoir surface area was monitored as well by the project entity. It was measured by a qualified entity that was commissioned to by the project entity. Detailed description is as follows in section 4.4.1 of this report.

In accordance with the applied methodology, the operational hours of emergency back-up diesel generator were also monitored. The number of operational hours were recorded once the generator was used. Detailed description of this parameter's monitoring is in section 4.4.2.

The indicative locations of all above metering instruments are showed in the diagram below.

Indicative electric connection diagram of the project activity:



2.3 Monitoring procedures

The monitoring activities were carried out according to the scheme below. The General Manager held the overall responsibility for the monitoring process. A monitoring officer was appointed and was responsible for verification of the measurement, collection of sales receipts and of billing receipts of the power supplied by the grid to the project.

Internal audit procedures were formulated to assess the accuracy of the monitored variables. The periodical audits covered:

- Monitored data collection and management procedures
- Quality of metering / calibration records
- Quality and accuracy of the monitored data

Monitored variables was collected and recorded in a monthly log sheet. At the end of each month the monitoring officer collected all daily logs and archived a copy of the logs with the CDM monitoring information. The monitoring officer sent a copy of monthly readings to Caspervandertak Consulting or Gansu Tonghe Investment Project Consulting Co., Ltd for an external quality control and quality assurance.

3. Quality Control (QC) and Quality Assurance (QA)

3.1 QA/QC procedures

Table 2. QA/QC procedures

ID	Uncertainty level of data (high/medium/low)	QA/QC procedures
EGy	Low	<i>These data will be directly used for calculation of emission reductions. Sales record to the grid and other records are used to ensure the consistency.</i>
Surface area reservoir	Low	<i>The power density of the project is well above 10 W/m2 and therefore substantial deviations from the calculated design surface area will not affect the calculation of emission reductions by the project. Therefore no further QA/QC procedures will be applied. No further QA&QC procedures are considered necessary</i>
Operational hours of emergency back-up diesel generator	Low	<i>The actual annual emissions associated with the operation of the emergency back-up diesel generator amount to about 0.0019% of total emission reductions and are therefore considered negligible. In case of actual emergencies the project entity will not claim emission reductions (see section B.7.2 in the registered PDD). Further QA/QC procedures are therefore not considered necessary.</i>

3.2 Roles and responsibilities

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with Gansu Diantou Bingling hydropower Co., Ltd.

- Mr. Chen Guangli, the monitoring officer, is the director of Planning & Contract Department, is responsible for the Verification of measurement & calculation of emission reductions;
- Mr. Li Peiyi, the general manager is responsible for Review / Internal audit

3.3 Calibration

Table 3. Calibration information of meters

Meter	Model Number	SN	Accuracy Class	Date of callbration	Calibration carried out by
M2a	SL7000	36139071	0.2S	2008-03-21 2009-03-20	Electric Energy Metrology Center of Gansu Electric Power Corporation
M3a	SL7000	36088323	0.2S	2007-09-19 2008-07-10	Electric Energy Metrology Center of Gansu Electric Power Corporation
M3b	SL7000	36139070	0.2S	2008-03-21 2009-03-20	Electric Energy Metrology Center of Gansu Electric Power Corporation
M2b	SL7000	36139068	0.2S	2008-03-21 2009-03-20	Electric Energy Metrology Center of Gansu Electric Power Corporation
M4	DTSD341	20070701110015	0.5	2008-7-1	Electric Energy Metrology Center of Gansu Electric Power Corporation
M5	DS862	00487911	0.5	2009-02-17	Yongjing County Quality and technical supervision Bureau
M5 previously used*	DSM9-1	0019179	0.5	2008-02-16	Yongjing County Quality and technical supervision Bureau

*The previously used grid side meter on backup line M5 (SN 0019179) was replaced by the currently used meter (SN 00487911) on 17th March 2009 due to periodically check reason by the grid company.

4. Calculation of emission reductions

4.1 Emission reductions calculation equation

In accordance with the methodology ACM0002 (version 6) and the registered PDD, the emission reductions of the project (ER_y , expressed in tCO₂e) are calculated according to the following formula:

$$ER_y = BE_y - PE_y - L_y$$

With:

- ER_y , emission reductions in year y
- BE_y , baseline emissions in year y
- PE_y , project emissions in year y
- L_y , leakage in year y

4.2 Baseline emissions (BE_y)

Baseline emissions of the project are calculated according to the following formula:

$$BE_y = EG_y \times EF_y$$

With:

- BE_y , the baseline emissions in year y , in tCO₂e
- EG_y , the electricity supplied by the project activity to the grid in year y , in MWh
- EF_y , the emission factor in year y , in tCO₂e/MWh

4.2.1 Calculation of baseline emission factor (EF_y)

The emission factor has in accordance with the Project Design Document been calculated on an ex-ante basis and is not updated during the crediting period.

$$EF_y = 0.8498 \text{ tCO}_2\text{e/MWh}$$

4.2.2 Calculation of electricity supplied by the project activity to the grid (EGy)

Table 4 Electricity exchange with the grid

Period		Electricity supplied to the Grid by the project (MWh)				Electricity imported from the Grid by the project (MWh)					
		Through main line			Through main line			Through back-up line			
		Meter reading in total (M2a+M2b)	Grid Data in total (M3a+3b)	Conservative value	Meter reading in total (M2a+M2b)	Grid Data in total (M3a+3b)	Conservative value	Meter reading (M4)	Grid Company's Data (M5)	Conservative value	
		A	B	C=Min(A,B)	D	E	F=Max(D, E)	G	H	I=Max(G,H)	J=F+I
year 2008	04/08-31/08	11,415.360	10,483.550	10,483.550	4.620	4.644	4.644	0	0	0	4.644
	01/09-30/09	16,565.340	16,010.610	16,010.610	5.280	5.304	5.304	0	0	0	5.304
	01/10-31/10	19,259.460	18,620.294	18,620.294	0.000	0.000	0.000	0	0	0	0.000
	01/11-30/11	20,894.280	20,398.488	20,398.488	34.320	34.344	34.344	0	0	0	34.344
	01/12-31/12	39,518.160	38,580.718	38,580.718	29.040	29.064	29.064	0	0	0	29.064
	Subtotal	107,652.600	104,093.660	104,093.660	73.260	73.356	73.356	0	0	0	73.356
year 2009	01/01-31/01	44,874.060	44,264.740	44,264.740	104.280	104.664	104.664	0	0	0	104.664
	01/02-11/02	19,797.360	19,074.462	19,074.462	29.700	29.912	29.912	0	0	0	29.912
	Subtotal	64,671.420	63,339.202	63,339.202	133.980	134.576	134.576	0	0	0	134.576
Total		172,324.020	167,432.862	167,432.862	207.240	207.932	207.932	0	0	0	207.932

Table 5. Calculation of net electricity supply to the grid by the project

Period	Electricity supplied to the grid by the project (ESy, MWh)	Electricity Imported from the grid to the project (EDy, MWh)		Net electricity supplied to grid by the project (EGy, MWh)
	Through main line	Through main line	Through back-up line	
04/08/2008-31/12/2008	104,093.660	73.356	0	104,020.304
01/01/2009-11/02/2009	63,339.202	134.576	0	63,204.626
Total 04/08/2008-11/02/2009	167,432.862	207.932	0	167,224.930

4.2.3 Calculation of baseline emission (BE_y)

Baseline Emissions are calculated by multiplying the Baseline Emission factor by the electricity supplied by the project activity to the grid by the project as prescribed below:

$$BE_y = EG_y \cdot EF_y$$

Table 6 Calculation of baseline emission

Period	Net electricity supplied by the project (EG_y , MWh)	EF (tCO ₂ /MWh)	Baseline Emission(BE_y)(tCO ₂)
04/08/2008-31/12/2008	104,020.304	0.8498	88,396
01/01/2009-11/02/2009	63,204.626		53,711
Total over monitoring period 04/08/2008-11/02/2009	167,224.930		142,107

4.3 Emergencies

During the monitoring period there have been no occurrences of emergencies.¹

4.5 Project emissions

Gansu Huanghe Bingling is a new hydro electric power project, and thus project emissions shall be taken into account if any based on the Methodology ACM 0002.

4.4.1 Surface area of the reservoir

The project entity commissioned Gansu Provincial Territorial Resources Planning Institute (hereinafter referred to as the Institute) to measure the reservoir surface area. In July 2009 the Institute issued the "Reservoir Water Area Measurement Report for Gansu Huanghe Bingling Hydropower Station". In this report it's indicated that Bingling reservoir water area is 2,871,999.3 m² at the full capacity water level. The power density calculated accordingly is 83.57 W/m² which is still sensibly higher than 10 W/m². Thus the emissions from the reservoir do not have to be taken into account according to the methodology.

4.4.2 Operational hours of emergency back-up diesel generator

The emergency back-up diesel generator on site has a capacity of 400 kW and its operation hours during the whole VER period are recorded as 6.33hours.

According to the PDD, for the emission factor of the diesel generator we refer to the AMS.ID (version 10) methodology which provides emission factors for diesel generator systems. We apply the highest value listed in the methodology which is 2.4 kg CO₂e/kWh (generators below 15 kW), which is conservative considering the size of the generator used on-site. We estimate the annual emissions by the diesel generator as below:

Table 7 Calculation of diesel generator ER

Period	Installed Capacity of the Diesel Generator(kW)	Measured Operation Hours	EF for the Diesel Generator (kg CO ₂ /kWh)	Emission of the Diesel Generator (tCO ₂)
04/08/2008-31/12/2008	400	5	2.4	5
01/01/2009-11/02/2009		1.33		2
Total over monitoring period 04/08/2008-11/02/2009		6.33		7

¹ Emergencies are defined here as "conditions under which the project entity has not been able to monitor due to unexpected accidents".

4.5 Leakage

This project only gives rise to emissions mainly from the station construction. According to the methodology ACM0002 Version 6 here applied, these emissions do not need to be considered as leakage.

Therefore

$$L_y=0$$

4.6 Calculation of emission reductions (ER_y)

Table 8 Calculation of baseline emission

Period	Project Emissions (tCO ₂)	Baseline emissions (tCO ₂)	Leakage (tCO ₂)	Emission Reductions (tCO ₂)*
04/08/2008-31/12/2008	5	88,396	0	88,391
01/01/2009-11/02/2009	2	53,711	0	53,709
Total over monitoring period 04/08/2008-11/02/2009	7	142,108	0	142,100

Therefore emission reductions during the period **04/08/2008 – 11/02/2009**, are calculated as **142,100 t CO₂e**.

5. Comparison of the actual emission reductions with estimate in the registered PDD

The monitoring period is from 04/08/2008 to 10/02/2009 which contains 192 days. The actual emission reductions achieved during this period was 142,100 tCO₂e, leading to annual amount of 270,139 t CO₂. According to the annual emission reductions in the PDD, the expected emission reductions during this monitoring period should be 764,452 tCO₂e, meaning that the actually achieved emission reductions during this monitoring period is 64.6% less than the estimate in registered PDD.

The reason for this is the project was not put into operation with full capacity until July 2009. Detailed operation start date of each unit is showed in the table below:

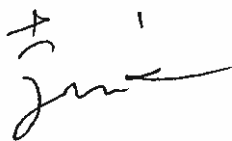
Turbine-generator unit Number	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Power supply start date	8 th Jan 2009	8 th , Dec. 2008	7 th July. 2009	23 rd , May 2009	4 th , Aug. 2008
Length of time the unit is operational for until end date of the monitoring period (11 th Feb 2009)	1 month	2 months	not operational	not operational	6 months

It can be seen from the table that only 3 sets of the 5 were put into operation before the end date of this monitoring period, of which 2 have been supplying power to the grid for 2 months. Thus the actual amount of power supply is much less than the estimate in registered PDD and therefore the emission reductions could not reach the expected amount in registered PDD.

6. Submission and authorization

This monitoring report has been prepared and submitted by Gansu Diantou Bingling Hydropower Development Co., Ltd. The below officer declares that the contents of the report provide an accurate representation of the monitoring results.

On behalf of Gansu Diantou Bingling Hydropower Development Co., Ltd.

A handwritten signature in black ink, appearing to be 'Li Peiyi' with a stylized flourish at the end.

Name: Li Peiyi
Title: General Manager
Date: 24/07/2009

Appendix to Monitoring report
VCS2007 additional requirements:

1. Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

The main objective of the project is to generate power from clean renewable clean power in Gansu Province and contribute to the sustainability of power generation of the North West China Power Grid. The project will reduce GHG emissions through the displacement of mainly fossil-fuel based grid connected power generation. The project does not involve in the creation of any greenhouse gas emissions, which demonstrates that it was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

2. Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

If the project has created another form of environmental credit, the proponent must provide a letter from the program operator that the credit has not been used and has been cancelled from the relevant program.

The project does not take part in emission trading programs besides their status under CDM. However, the VERs claimed is related to a different period (before the start of the CDM Crediting Period) and therefore there is no double counting. Besides, Gansu Diantou Bingling Hydropower Co., Ltd. confirmed in a separate statement provided to the verifier that it "has the full ownership rights in and to any VER to be generated and issued by the Project" and that is "has not sold, transferred, assigned, licensed, disposed of, granted or otherwise the contract VER in favor of any third party" and that "the VER will only be sold once.", it is clear that the emission reductions generated by the project during the monitoring period will be sold only once. This statement is provided to DOE.

3. Project rejected under other GHG programs (if applicable):

Projects rejected by other GHG programs, due to procedural or eligibility requirements where the GHG program applied have been approved by the VCS Board; can be considered for VCU but project proponents for such a project shall:

- clearly state in its VCS PD all GHG programs for which the project has applied for credits and why the project was rejected, such information shall not be deemed commercially sensitive information; and
- provide the VCS verifier and Registry with the actual rejection document(s) including explanation; and
- have the project validated against VCS program requirements.

Gansu Huanghe Bingling Hydropower Station Project has never applied to any other greenhouse gas programs outside of the CDM. The buyer of the pre-CDM emission reduction credits is the exclusive buyer of these credits, as will be evidence by the VER ERPA document once agreed upon and signed by both project owner and buyer.

4. Please provide proof of title.

Please find the following documents showing the proof of ownership:

1. Copy of Business License

2. Copy of Equipment Purchase agreement

5. Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

Project proponents of projects that reduce GHG emissions from activities that:

- are included in an emissions trading Program; or
- take place in a jurisdiction or sector in which binding limits are established on GHG emissions;

shall provide evidence that the reductions or removals generated by the project have or will not be used in the Program or jurisdiction for the purpose of demonstrating compliance. The evidence could include:

- a letter from the Program operator or designated national authority that emissions allowances (or other GHG credits used in the Program) equivalent to the reductions/removals generated by the project have been cancelled from the Program; or national cap as applicable or;
- purchase and cancellation of GHG allowances equivalent to the reductions/removals generated by the project related to the Program or national cap.

A separate statement provided to the verifier from Gansu Diantou Bingling Hydropower Co.,Ltd certifies that "The carbon credits related to the pre-cdm registration have been developed in accordance with the Voluntary Carbon Standard (www.v-c-s.org) and neither the VER nor the GHG emissions have been used by the seller or any third party to meet any international, federal state or local requirement, renewable energy procurement, renewable portfolio standard and other mandate", thus we can conclude that the PP is not included in any additional emission trading system.
