
VERIFICATION REPORT AND CERTIFICATION STATEMENT

**Caspervandertak Consulting (Beijing) Co.,
Ltd.**

**Gansu Huanghe Bingling Hydropower
Station Project**

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Date of Issue:		Project Number:	
18-01-2010		CCP.VOL0704B	
Project Title:			
Gansu Huanghe Bingling Hydropower Station Project			
Organisation:		Client:	
SGS United Kingdom Limited		Caspervandertak Consulting (Beijing) Co., Ltd.	
Publication of Monitoring Report:			
Monitoring Period:		04/08/2008 - 11/02/2009	
First Monitoring Report Version and Date:		Version 1.0 dated 24/07/2009	
Final Monitoring Report Version and Date:		Version 2.0 dated 21/12/2009	
Summary:			
SGS United Kingdom Ltd has performed the verification of the VCS 2007.1 project Gansu Huanghe Bingling Hydropower Station Project (UNFCCC Ref. No. 1985 & SGS Ref. No. CCP.VOL0704B). The verification includes confirming the implementation of the monitoring plan of the registered CDM PDD version 2.2 dated 10/02/2009 and the application of the monitoring methodology as per ACM0002 version 06. A site visit was conducted to verify the data submitted in the monitoring report. Gansu Huanghe Bingling Hydropower Station Project is a new reservoir hydropower plant. The installed capacity of the project is 240 MW consisting of five hydro turbines and five generators with unit capacity of 48 MW. The electricity generated by the project is supplied to North West China Power Grid. SGS confirms that the project is implemented in accordance with the validated Project Description. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and validated project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 142,100 tCO₂e Emission Reductions during period from 04/08/2008 up to 11/02/2009.			
Subject:			
VCS 2007.1 Project Verification			
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Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
MP	Monitoring Plan
MRR	Meter Reading Record
MR	Monitoring Report
NWCPG	Northwest China Power Grid
PP	Project Participant
PPA	Power Purchase Agreement
SGS	SGS United Kingdom Ltd
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS PD	VCS Project Description
VCU	Voluntary Carbon Unit

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1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by Caspervandertak Consulting (Beijing) Co., Ltd. to perform an independent verification of its VCS project "Gansu Huanghe Bingling Hydropower Station Project". The verifiers have reviewed the GHG data collected to date for the period between 04/08/2008 and 11/02/2009.

The purposes of this verification exercise are, by review of objective evidence, to independently review:

- Whether the project has resulted in emission reductions as declared by the organisation or GHG project's GHG assertion;
- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

This engagement covers verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the Gansu Huanghe Bingling Hydropower Station Project.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the defined reporting period.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 VCS project Description

Gansu Huanghe Bingling Hydropower Station Project is a new reservoir hydropower plant. The installed capacity of the project is 240 MW consisting of five hydro turbines and five generators with unit capacity of 48 MW. The electricity generated by the project is supplied to North West China Power Grid.

1.4 Level of assurance

The level of assurance of the verification report is reasonable assurance engagements as selected by the Client. Materiality for the project is 5%.

1.5 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Gansu Huanghe Bingling Hydropower Station Project
SGS Reference No:	CCP.VOL0704B
Monitoring Period Covered in this Report:	From 04/08/2008 to 11/02/2009
Project Owner:	Gansu Diantou Bingling Hydropower Development Co., Ltd.
Location of the Project Activity:	Yongjing County, Linxia Hui Autonomous Prefecture, Gansu Province, PR China

The five generators started generating and supplying electricity to the grid on 04/08/2008, 08/12/2008, 08/01/2009, 23/05/2009 and 07/07/2009, respectively. The net electricity supplied to the grid by the project covering the period from 04/08/2008 to 11/02/2009 was used to calculate the emission reductions achieved by the project in this monitoring period.

2. Methodology

2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Verification checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

Name	Role	SGS Office
Ginger Jiang Yuan	Lead Assessor	SGS China
Michael Wu	Assessor	SGS China
Yolanda Zheng	Local Assessor/Expert	SGS China

2.3 Means of Verification

2.3.1 Review of Documentation

The registered PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 7 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed by Michael Wu and Yolanda Zheng

Location: Yongjing County, Linxia Hui Autonomous Prefecture, Gansu Province, People's Republic of China	
Date: 29/07/2009 to 31/07/2009	
Coverage:	Source of Information / Persons Interviewed
1. Visual inspection on key physical components and spatial configuration of the operating and monitoring system of the entire project	Mr. Li Yang; Gansu Diantou Bingling Hydropower Development Co., Ltd.
2. A review of the Monitoring Report, meter reading records, invoices, ETNs and turbine generation logbooks;	Mr. Wang Tianlin; Gansu Diantou Bingling Hydropower Development Co., Ltd.
3. An interview with project participants, including reviewing the Key Physical Components of the Project, monitoring plan and staff training records;	Mr. Xia Tian; Caspervandertak Consulting (Beijing) Co., Ltd.
4. Collection of the calibration certificates of the metering system and the accreditation certificate for the calibrating entity;	Ms. Zhao Yonghong; Gansu Tonghe Investment Project Consulting Co., Ltd.
5. Inspection of the control room, instrument room and step-up substation	Ms. Yu Rong; Gansu Tonghe Investment Project Consulting Co., Ltd.
6. Review of calculations and assumptions made in determining the GHG data and emission reductions;	Ms. Wei Lixian; Gansu Tonghe Investment Project Consulting Co., Ltd.
7. Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.	

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;
- II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

FARs may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and Clarification Requests are detailed in Verification Checklist. The Project Developer is given the opportunity to “close” outstanding CARs and respond to CLs and FARs.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 Project Documentation and Compliance with the registered PDD and VCS PD

Based on the information available from the UNFCCC website, <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1217926221.96/view>, the project was registered against the approved consolidated methodology ACM0002 version 06 on 12/02/2009 under the UNFCCC Reference Number 1985 (/2/). The first CDM crediting period is from 12/02/2009 to 11/02/2016 (renewable). This report involves the verification of the emission reductions achieved by the project before CDM registration covering the period from 04/08/2008 to 11/02/2009. The start date of the project was 04/08/2008 which was the day when the project began reducing GHG emissions and the end date of the project is the day before the CDM registration date. Related requirements of VCS 2007.1 are validated in Appendix 1 of the report.

The project was registered against the approved consolidated methodology ACM0002 version 06 dated 19/05/2006 (/3/). The monitoring methodology has been correctly applied and the documents for the monitoring period are complete and transparent. The project boundary is consistent with the registered PDD (/1/). Management and operational system is in place. QA/QC procedures stipulated in the registered PDD have been followed.

The project involves the installation of five hydro turbines and five generators with unit capacity of 48 MW. The total installed capacity of the project is 240 MW. The electricity generated by the project is supplied to North West China Power Grid.

As per Table A.2 in page 5 of the registered PDD, the type of the turbines was GZ(741)-WP-625 with the capacity of 48 MW and the type of the generators was SFWG48-56/. The nominal water flow of the turbine was 332 m³/s and the turbine run-away rotation speed was 267.8 rpm. Through onsite visit, it is verified that the type of the turbine is GZHK-1RT-WP-620 with the capacity of 49 MW and the type of the generator is SFG48-56/6700. The turbine nominal water flow was 335 m³/s and the turbine run-away rotation speed was 330 rpm. **CAR #2 was raised** requesting PP to clarify the reason for the changes and the affect of the changes to the additionality, applicability of the methodology. The reason for the change was clarified and the PDD was revised according to the actual status. The impact of the changes to the (i) additionality of the project activity; (ii) scale of CDM project activity; (iii) applicability and application of Approved Baseline Methodology under which the project activity has been registered have been discussed and validated in Appendix 2 of the verification report. In our opinion, the changes from the project activity as described in the revised PDD have no impact on the three aspects mentioned above. **CAR #2 was closed.**

3.2 Monitoring Results

As per pages 31 to 35 of the registered PDD version 2.2 dated 10/02/2009, the net electricity supplied to the grid by the project (EG_y), surface area at full reservoir level (Surface area reservoir) and annual hours that the emergency back-up diesel generator is running either for the purpose of commissioning/maintenance or actual emergencies (Operational hours of emergency back-up diesel generator) are the three parameters that need to be monitored.

3.2.1 EG_y: net electricity supplied to the grid by the project

As per pages 31 to 35 of the registered PDD, electricity supplied to the grid by the project (ES_y) and electricity imported from the grid by the project (ED_y) need to be monitored for the calculation of net electricity supplied to the grid by the project (EG_y).

As per figure B.3 in page 31 of the PDD, the electricity supplied to and imported from the grid through the two main lines (Line 1 to the 110kV Transformer Substation and Line 2 to the 330 kV Transformer Substation) are monitored by two main meters (M3a on line 1 and M3b on line 2) which are used for electricity transaction purpose and two backup meters (M2a on line 1 and M2b on line 2). The electricity imported from the grid through the backup line (Line 3 from the 35 kV Transformer Substation) is monitored by the main meter (M5) and by the backup meter (M4).

As per page 12 and 13 of the PPA signed with the grid company (/8/), the transaction of electricity supplied to the grid is based on the meter reading of the meters at the Transformer Substation and the meters installed at the project site. Through on site survey, it is verified that all the meters mentioned above have been installed as stated in the registered PDD (/7/). Detailed parameters of the meters are as follows:

Meters	Lines	SN	Type	Accuracy
M2a	1	36139071	SL7000	0.2S
M2b	2	36139068	SL7000	0.2S
M4	3	20070701110015	DTSD341	0.5
M3a	1	36088323	SL7000	0.2S
M3b	2	36139070	SL7000	0.2S
M5 (previous) *	3	0019179	DS862	0.5
M5		00487911	DSM9-1	

* Note: M5 (SN: 0019179) was replaced with a new meter (SN: 00487911) on 17/03/2009. The Meter Replacement Record was provided and it was verified that the replacement was carried out by local power company due to periodic replacement reason.

As per page 31 of the registered PDD, the metering instruments will be calibrated annually by the grid company or a certified company appointed by the grid company in accordance with the "Technical administrative code of electric energy metering (DL/T448 - 2000).

CL #3 was raised for the lack of information about the meters monitored by the grid company (M3a, M3b and M5) and their calibration in the Monitoring Report version 1. PP clarified by providing the related information in the MR version 2. Detailed calibration information is as follows:

Meters	Calibration Date	Certificate Number
M2a	21/03/2008	QJJL-NAS08-036
	20/03/2009	QJJL-XBJ09-1078
M2b	21/03/2008	QJJL-NAS08-040
	20/03/2009	QJJL-XBJ09-1076
M4	01/07/2008	QJJL-XBJ08-1067
M3a	19/09/2007	QJJL-NAS07-133
	10/07/2008	QJJL-XBJ09-1011
M3b	21/03/2008	QJJL-NAS08-038
	20/03/2009	QJJL-XBJ09-1075

The above five meters were calibrated by Electric Energy Metrology Center of Gansu Electric Power Corporation which was accredited by Gansu Province Quality and Technology Supervision Bureau. Metrological Authorization Certificate No.: (Gan) Metro(2006)62055 valid from 05/01/2006 to 04/01/2011.

M5 (previous)	16/02/2008	08020018
M5 (new)	17/02/2009	09020016

The above two meters were calibrated by Yongjing County Quality and Technical Supervision Bureau which was accredited by Gansu Province Quality and Technology Supervision Bureau. Metrological Authorization Certificate No.: (Gan) Metro(2005)62152 valid from 29/12/2005 to 28/12/2010.

The calibration certificates (/11/13/) and Metrological Authorization Certificates of the calibration entities (/12/14/) were present for verification. It is verified all the meters have been calibrated annually by accredited third party as per the description in the registered monitoring plan. **CL #3 was closed.**

ES_y and ED_y are hourly measured by the meters M2a, M2b and M4 and monthly recorded into Meter Reading Records (MRRs) (/9/) by designated personnel of the project company on agreed date. Designated personnel of the grid company read and record the meter reading of M3a, M3b and M5 on the same day. After confirming the data of monthly ES_y and ED_y by each party, sale receipts for the electricity supplied to and imported from the grid by the project are issued by corresponding parties.

The data of ES_y and ED_y in MRRs were used to calculate the net electricity supplied to the grid by the project (/4/). Sale receipts (/10/) were used for cross check. The difference between the data recorded by the Project Company and grid company was verified to be within reasonable range considering the line loss and the more conservative

data were used to calculate the baseline emissions (/5/). Data in the operational log of the project was randomly checked for assurance.

The reported PO's data of electricity supplied to the grid by the project in November 2008 (20,936.520 MWh) and reported Grid's data of electricity imported from the grid in January 2009 (101.664 MWh) in MR version 1 were verified to be incorrect. **CAR #4 was raised** in this regard. PP clarified that the difference was caused by a mistake when transferring the data. **CAR #4 was closed** after the data were corrected to be 20,894.280 MWh and 104.664 MWh, respectively in the monitoring report version 02.

3.2.2 Surface area reservoir: Surface area at full reservoir level

As per page 31 of the registered PDD and the ACM0002 version 06, surface area at full reservoir level will be monitored at the start of the project.

The surface area at full reservoir level was measured and calculated by Gansu Provincial Territorial Resources Planning Institute (/16/). The surface area measurement report and the accreditation certificate issued by Gansu Provincial Bureau of Surveying and Mapping (/17/) were provided for verification. It is verified that the surface area at full reservoir level was calculated based on the design schematics and area maps of the project as well as the measurement carried out by the Institute. The reported value of surface area at full reservoir (2,871,999.3 m²) was verified to be consistent with the data in the measurement report.

The measured surface area at full reservoir was smaller than the estimation in the registered PDD. The reason for the difference was clarified in the monitoring report and was verified to be reasonable as per the description in the measurement report. The difference was caused by the building of the protection embankments which decreased the submerged area.

The power density of the project is verified to be 83.57 W/m² which is higher than 10 W/m². Thus, the project emission from the reservoir can be considered zero as per ACM0002 version 06.

3.2.3 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

As per page 30 of the registered PDD, The project will install an on-site diesel generator with a capacity of at most 400 kW which will be maintained for emergency purposes in case all power connections to the grid are cut off. As per the monitoring plan, the project entity will record the operational hours of the emergency backup diesel generator in the daily operation logs.

Through on site visit, it is confirmed that a backup diesel generator with the capacity of 400 kW has been installed at the project site as per the registered PDD and the monitoring procedure has been established. Designated personnel of the project company record the start time and stop time of each running of the diesel generator and calculate the operational time. The operational time will be accumulated in each monitoring period.

The operational logs of the diesel generator (/15/) were provided for verification. It was verified that no emergency occurred in this monitoring period and the generator only operated for several minutes each time for maintenance purpose.

CAR #5 was raised because the operational hours of emergency back-up diesel generator in this monitoring period in the monitoring report version 1 was verified to be different from the data verified by the assessors. The PP corrected the operational hours in the MR version 2. The operational hours in MR version 2 (5 hours from 04/08/2008 to 31/12/2008 and 1.33 hour from 01/01/2009 to 11/02/2009) was verified to be consistent with the data from the daily operational log of the backup diesel generator. **CAR #5 was closed.**

The emission from the operation of the backup diesel generator in this monitoring period was verified to be 7 tCO₂e (5 tCO₂e in 2008 and 2 tCO₂e in 2009) using the full load factor of the diesel generator (400kWh) and the highest emission factors for diesel generator systems listed in the methodology (AMS.I-D) which is 2.4 kg CO₂e/kWh for conservativeness. The emission from the operation of backup diesel generator was deducted in the calculation of emission reductions in the MR version 2. The calculation was checked and found to be consistent with the registered PDD and applied methodology.

3.3 Remaining Issues, CAR's, CL's from Previous Validation or Verification

This is the first VCS verification for the project. There are no remaining issues from previous validation (/16/).

3.4 Project Implementation

Project was implemented and equipments were installed as described in the registered PDD.

3.5 Completeness of Monitoring

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable.

3.6 Accuracy of Emission Reduction Calculations

CAR #4 and CAR #5 were raised regarding the calculation of baseline and project emissions and they were closed. The details of the reported and the verified values for all parameters are listed in section 4.

The calculation of emission reductions in this monitoring period in the monitoring report was checked and confirmed to be consistent with the registered PDD and applied methodology. The reported emission reductions in the MR version 2 are verified to be accurate, complete and conservative.

The emission reductions in the monitoring period was verified to be 142,100 tCO₂e, while the emission reductions for the corresponding period was calculated to be 764,452 tCO₂e as per the annual estimation in the registered PDD. The actual emission reductions in this monitoring period are much lower than the estimation in the PDD, which was due to the fact that only three out of the five hydro turbine generators were installed and the project was not under full operation in this monitoring period.

3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed above in section 3.2 above. All the data recorded is in compliance with the monitoring report.

3.8 Management and Operational System and Quality Assurance

Management system and quality assurance procedures have been stipulated in the monitoring plan and have been implemented during daily operation (/18/). The monitoring staff were trained as per the training plan (/19/). This has been verified by on-site visit and document review. Therefore we can affirm that the management system of the VCS project is in place; with the responsibilities properly identified and in place.

3.9 Data from External Sources

According to the description in Section B.6.1 of the PDD version 2.2 dated 10/02/2009 and page 11 of the validation report dated 10/02/2009, the baseline emission factor is determined ex-ante and fixed for the first crediting period. The value of the baseline emission factor used in the monitoring report version 2.0 dated 21/12/2009 is 0.8498 tCO₂e/MWh. It complies with the calculated value of the baseline emission factor in the registered PDD version 2.2 dated 10/02/2009.

As per page 30 of the registered PDD and AMS-I.D version 10, the emission factor of the backup diesel generator is 2.4 kgCO₂e/kWh (generators below 15 kW). It was verified that the emission factor of the diesel generator in the monitoring report version 2 was consistent with the PDD and AMS-I.D.

4. Calculation of Emission Reductions

Parameter 1	ES _y : Electricity supplied to the grid by the project	
Period	Reported Value (MWh)	Verified Value (MWh)
04/08/2008*-31/08/2008	10,483.550	10,483.550
01/09/2008-30/09/2008	16,010.610	16,010.610
01/10/2008-31/10/2008	18,620.294	18,620.294
01/11/2008-30/11/2008	20,398.488	20,398.488
01/12/2008-31/12/2008	38,580.718	38,580.718
Subtotal	104,093.660	104,093.660
01/01/2009-31/01/2009	44,264.740	44,264.740
01/02/2009-11/02/2009*	19,074.462	19,074.462
Subtotal	63,339.202	63,339.202
Total	167,432.862	167,432.862

Parameter 2	ED _y : Electricity imported from the grid by the project	
Period	Reported Value (MWh)	Verified Value (MWh)
04/08/2008*-31/08/2008	4.644	4.644
01/09/2008-30/09/2008	5.304	5.304
01/10/2008-31/10/2008	0	0
01/11/2008-30/11/2008	34.344	34.344
01/12/2008-31/12/2008	29.064	29.064
Subtotal	73.356	73.356
01/01/2009-31/01/2009	104.28	104.664
01/02/2009-11/02/2009*	29.7	29.912
Subtotal	133.980	134.576
Total	207.240	207.932

* Note: The meter readings on 11/02/2009 were recorded and used to calculate the electricity supplied to and imported from the grid in the period from 01/02/2009-11/02/2009. The confirmation statement of the electricity supplied to and imported from the grid for corresponding period was obtained from the grid company and provided to the verification team for cross check.

Parameter 3	EG _y : Net electricity supplied to the grid by the project	
Period	Reported Value (MWh)	Verified Value (MWh)
04/08/2008-31/12/2008	104,020.304	104,020.304
01/01/2009-11/02/2009	63,205.22	63,204.626
04/08/2008 -11/02/2009	167,225.62	167,224.930

Parameter 4	Emission Reductions					
Period	EG _y (MWh)	EF _y (tCO ₂ e/ MWh)	BE _y = EG _y * EF _y (tCO ₂ e)	PE _y (tCO ₂ e)	Ly (tCO ₂ e)	ER _y = BE _y – PE _y – Ly (tCO ₂ e)
04/08/2008-31/12/2008	104,020.304	0.8498	88,396	5	0	88,391
01/01/2009-11/02/2009	63,204.626	0.8498	53,711	2	0	53,710
04/08/2008-11/02/2009	167,224.930	0.8498	142,107	7	0	142,100

5. Recommendations for Changes in the Monitoring Plan

No recommendation for changes in the monitoring plan was made during this periodic verification.

6. VCU Certification Statement

The scope of the verification

We, SGS have been engaged by Caspervandertak Consulting (Beijing) Co., Ltd. to certify that the greenhouse gas (GHG) emission reductions reported for Gansu Huanghe Bingling Hydropower Station Project (UNFCCC Reference No.: 1985) for the period from 04/08/2008 to 11/02/2009 in the verification report and a monitoring report version 2.0 dated 21/12/2009 are eligible for registration as Voluntary Carbon Units.

This engagement covers the verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the Gansu Huanghe Bingling Hydropower Station Project, as well as an additional confirmation of the compliance of the registered PDD with the requirements of VCS 2007.1.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the defined reporting period.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

Conclusions of the verification

(a) We are an entity accredited by the United Nations Framework Convention for Climate Change (UNFCCC) to undertake certification and verification services in the sector in which the Project is undertaken. The accreditation is accepted by VCS Board as indicated in Clause 9 of VCS 2007.1.

(b) The monitoring report, together with other information examined, was prepared in full substance and form as required by the Voluntary Carbon Standard version 2007.1, published by the Climate Group as approved by the Voluntary Carbon Standard Steering Committee on 18/11/2008.

(c) The information in the Project's monitoring report together with other information examined by us, including all the information necessary for us to determine that the emission reductions achieved have been determined correctly.

(d) Based on our examination of the monitoring report and other relevant information, the Project meets all the requirements of the Voluntary Carbon Standard verification criteria contained in the VCS 2007.1.

(e) Based on our examination of the monitoring report and other relevant information, the claiming emission reductions during the monitoring period from 04/08/2008 to 11/02/2009 are verified as 142,100 tonnes CO₂ equivalent.

Liability statement with regards to the accuracy of the verification statement

The management of the project, Gansu Diantou Bingling Hydropower Development Co., Ltd., is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions. SGS is responsible for verification and confirming emission reductions for the project, as described in the monitoring report.

Our examination includes an assessment of evidence, through desk review, and where necessary, interviews, stakeholder discussions and site visit, relevant to certifying the rightfulness of the amounts and disclosures in relation to the Project's GHG emission reductions.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of GHG emission reductions for the given period, prepared on the basis of the monitoring report, are fairly stated.

This assessment included:

- Collection of evidence supporting the reported data
- Checking whether the provisions of the Monitoring Plan in the VCS PD, were consistently and appropriately applied

- A site visit and interview of relevant staff

We have verified whether the information included in the monitoring report representing the emission reductions achieved has been determined correctly for the given period from the baseline figure.

Certification statements

Based on process and procedures conducted, in our opinion, the monitoring report Version 2.0 dated 21/12/2009 on emission reductions for Gansu Huanghe Bingling Hydropower Station Project during the reporting period from 04/08/2008 to 11/02/2009 is materially correct and is a fair representation of the GHG data and information and the emission reductions are fairly stated. All relevant facts have been found correct by our examination. The GHG emission reductions were calculated correctly on the basis of ACM0002 Version 06 dated 19/05/2006.

Therefore, SGS is able to certify that the project is in full compliance with the Voluntary Carbon Standard 2007.1, and the quantity of the reported emission reductions during below reporting period are completely, comparably, accurately and correctly reported.

Reporting period: From 04/08/2008 to 11/02/2009

Verified emission in the above reporting period:

Project emissions	7	t CO ₂ equivalents
Leakage	0	t CO ₂ equivalents
Baseline emissions	142,107	t CO ₂ equivalents
Emission reductions	142,100	t CO ₂ equivalents

Wherein:

Unit: tCO₂ equivalents

Reporting Period	04/08/2008 - 31/12/2008	01/01/2009 - 11/02/2009
Baseline emissions	88,396	53,711
Project emissions	5	2
Emission reductions	88,391	53,709

Statement of Confidentiality

SGS will hold all information confidential until the client instructs otherwise or until it has been released in accordance with the VCS 2007.1 modalities and procedures.

Signature of Authorised Signatory



Name of Authorised Signatory: Siddharth Yadav

7. Document References

- /1/ PDD version 2.2 dated 10/02/2009
- /2/ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218542816.05/view>
- /3/ ACM0002 version 06 dated 19/05/2006
- /4/ VCS project monitoring report version 1.0 dated 24/07/2009; version 2.0 dated 21/12/2009
- /5/ ER calculation spreadsheet for the project in this monitoring period.
- /6/ Validation report for the project dated 10/02/2009 Rev No. 4 report No. 1113873
- /7/ Installation schematic of the project
- /8/ Power Purchase Agreement (PPA) signed between the grid company and the hydropower company
- /9/ Meter Reading Records of the meters installed at the project site from 04/08/2008 to 11/02/2009
- /10/ Sales receipts for the electricity supplied and imported by the project from 04/08/2008 to 11/02/2009
- /11/ Calibration certificates of meters issued by Electric Energy Metrology Center of Gansu Electric Power Corporation
- /12/ Metrological Authorization Certificate of Electric Energy Metrology Center of Gansu Electric Power Corporation issued by Gansu Province Quality and Technology Supervision Bureau. (Metrological Authorization Certificate No.: (Gan) Metro (2006)-62055 valid from 05/01/2006 to 04/01/2011).
- /13/ Calibration certificates of meters issued by Yongjing County Quality and Technical Supervision Bureau
- /14/ Metrological Authorization Certificate of Yongjing County Quality and Technical Supervision Bureau issued by Gansu Province Quality and Technology Supervision Bureau. Metrological Authorization Certificate No.: (Gan) Metro(2005)62152 valid from 29/12/2005 to 28/12/2010.
- /15/ Operation logbooks of the emergency backup diesel generator
- /16/ Surface Area Measurement Report issued by Gansu Provincial Territorial Resources Planning Institute
- /17/ Accreditation certificate of Gansu Provincial Territorial Resources Planning Institute issued by the State Bureau of Surveying and Mapping. Certificate No.: YiCeZiZhi62101029 valid from 08/12/2004 to 07/12/2009
- /18/ CDM Monitoring Manual
- /19/ Training Plan and training records of the staffs

A.1 Appendix 1: Validation of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS PD

As per information available on UNFCCC website, the project was registered as a CDM project on 12/02/2009 (UNFCCC Ref. No.:1985) with the first CDM crediting period from 12/02/2009 to 11/02/2016 (/1/). The start date of the project was 04/08/2008 which was the day when the project began reducing GHG emissions and the final CDM validation report of the project was completed on 10/02/2009 (/3/), which is in compliance with the requirement that VCS 2007.1 validation shall be completed within two years of the Project Start Date for non-AFOLU projects as per Section 5.2.1 of Voluntary Carbon Standard 2007.1 dated 18/11/2008 (/8/).

The monitoring period covered by this verification is from 04/08/2008 (start date) to 11/02/2009 (the day before the start date of CDM crediting period) (/4/), which is consistent with the requirement that VCUs can be registered back to the project start date for projects registered under other VCS Program approved GHG Programs as per Further Guidance for Projects that are registered in Two GHG Programs dated 19/03/2008 (/10/). The start date of this monitoring period is after both 28/03/2006 and 10/02/2007 which is two years prior to the completion of the project validation.

Since the project was registered as a CDM project with validation completed on 10/02/2009, a further validation shall be completed of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template as per VCS Guidance Document: VCS Project Registration and VCU Issuance Process version 1.1 (/9/) and Further Guidance for Projects that are registered in Two GHG Programs dated 19/03/2008.

CL #1 was raised because requirements of VCS PD 1.12, 1.13, 1.14, 8.1 and 8.2 were not covered in the monitoring report version 1.0. PP clarified by providing MR version 2.0 (/2/) in which Clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template were discussed. **CL #1 was closed.**

Validation of Clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template pursuant to Section 4.1.4 of VCS Guidance Document: VCS Project Registration and VCU Issuance Process version 1.1 are included here. Requirement set out in Section 5.2.1 of Voluntary Carbon Standard 2007.1 is fulfilled.

Clauses 1.12: *Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.*

Through onsite visit, interviewing the project owner and reviewing the project design, it was confirmed that the project was implemented to generate electricity using renewable hydro resources and replace the electricity which would otherwise be generated by grid connected power plants. Therefore, it was not implemented to create any GHG emissions primarily for the purpose of its subsequent removal or destruction.

Clause 1.13: *Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).*

The project was registered as CDM project on 12/02/2009 and the start date of the first CDM crediting period is 12/02/2009. The project does not take part in emission trading programs besides their status under CDM. 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 (/7/) provided to the verifier that the emission reductions generated by the project during the monitoring period will be sold only once.

Through interview with the project owner and document review of the statement from the project owner confirming that the project does not create another form of environmental credit, it is validated that the project has not created another form of environmental credit.

Clause 1.14: *Project rejected under other GHG programs (if applicable).*

PP clarified that Gansu Huanghe Bingling Hydropower Station Project has never applied for any other greenhouse gas programs besides CDM. The buyer of the pre-CDM emission reduction credits is the exclusive buyer of these credits, which is evidenced by the VER ERPA agreed upon and signed by both project owner and buyer.

Through interview with the project owner and review of the UNFCCC website, it is validated that the project has been registered as a CDM project on 12/02/2009. It has been validated that the project has not been rejected under other GHG programs.

Clause 8.1: Proof of Title

Business licence of Gansu Diantou Bingling Hydropower Co., Ltd. (No. 6229231000313) dated 03/03/2005 (/5/) and the Letter of Approval (LoA) issued by the Chinese DNA on the UNFCCC website of the project (/6/) were provided to confirm the ownership of the project. It is clearly indicated in the LoA that the project owner is authorized as Chinese participant to voluntarily participate in and carry out the project activity. The Chinese DNA had examined the ownership of the project before it issued the LoA to the project participant. Thus, it was confirmed that the project owner has the ownership of the project.

Clause 8.2: Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable)

A statement provided to the verifier from Gansu Diantou Bingling Hydropower Co., Ltd confirms that “The carbon credits related to the pre-CDM registration have been developed in accordance with the Voluntary Carbon Standard 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”.

Through interview with the project owner, it is validated that the project owner is not included in another voluntary emission trading programme listed on the website of VCS during this monitoring period and the ERs generated from the project will be sold only once.

The project takes place in China, which has no emission reductions target and the project is not a micro or mega project. There are no mandatory emission trading programmes in China. The project is not a grouped one. The PP has confirmed that there is no financially sensitive information that is provided to the DOE.

The project helps improving local economy, increasing local financial income and promoting electricity utilization in the local area. The project is in compliance with all relevant local laws and regulations for environmental protection, energy conservation and sustainable development. The project has obtained approvals from relevant authorities. There are no risks that may substantially affect the project's GHG emission reductions.

VALIDATION STATEMENT: According to the validation report for the project for CDM registration and the above further validation of Clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS PD, it is validated that the Project “Gansu Huanghe Bingling Hydropower Station Project” is in compliance with the VCS Program requirements as set out in the VCS Rules.

Document References

- /1/ <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218542816.05/view>
- /2/ VCS project monitoring report version 1.0 dated 24/07/2009; version 2.0 dated 21/12/2009
- /3/ Validation report for the project dated 10/02/2009 Rev No. 4 report No. 1113873
- /4/ Power Purchase Agreement (PPA) signed between the grid company and the hydropower company
- /5/ Business license of the project owner issued by local government
- /6/ LoA from the Chinese DNA
- /7/ Statement from the project owner about the trading of the voluntarily emission reductions.
- /8/ Voluntary Carbon Standard 2007.1 dated 18/11/2008
- /9/ VCS Guidance Document: VCS Project Registration and VCU Issuance Process version 1.1
- /10/ Further Guidance for Projects that are Registered in Two GHG Programs

A.2 Appendix 2: Validation opinion of the changes from the registered PDD

A2.1 Changes from the registered PDD

Based on the information available from the UNFCCC website, <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1217926221.96/view>, the project was registered against the approved consolidated methodology ACM0002 version 06 (/5/) on 12/02/2009 under the UNFCCC Reference Number of 1985. The first crediting period is from 12/02/2009 to 11/02/2016 (renewable).

As per Table A.2 in page 5 of the registered PDD (/2/), the model of the turbines was GZ (741)-WP-625 with the capacity of 48 MW and the model of the generators was SFWG48-56/. The nominal water flow of the turbine was 332 m³/s and the turbine run-away rotation speed was 267.8 rpm. Detailed parameters of the generator and turbine in the original registered PDD were as follows:

Turbine	Type	Type number	Capacity	
	Bulb-type propeller	GZ (741)–WP-625	48 MW	
	Nominal water flow	Water head		
		Minimum	Nominal	Maximum
	332 m ³ /s	11.6 m	16.1 m	25.7 m
	Nominal revolutions		Run-a-way rotation speed	
	107.1 rpm		267.8 rpm	
Generator	Type		Capacity	Type number
	Horizontal integrated (in turbine bulb)		48 MW	SFWG48-56/
	Nominal voltage		Nominal current	Power factor (lag)
	13.8 kV		2114A	0.95
	Nominal revolutions		Frequency	
	107.1 rpm		50 Hz	

Through onsite visit and document review of the equipment purchase agreement, it is verified that the model of the turbine is GZHK-1RT-WP-620 with the capacity of 49 MW and the model of the generator is SFG48-56/6700. The turbine nominal water flow is 335 m³/s and the turbine run-away rotation speed is 330 rpm. Detailed parameters of the generator and turbine in the revised PDD (/1/) are as follows:

Turbine	Type	Type number	Capacity	
	Bulb-type propeller	GZ HK–1RT-WP-620	49 MW	
	Nominal water flow	Water head		
		Minimum	Nominal	Maximum
	335 m3/s	11.6 m	16.1 m	25.7 m
	Nominal revolutions		Run-a-way rotation speed	
107.1 rpm		300 rpm		
Generator	Type	Capacity	Type number	
	Horizontal integrated (in turbine bulb)	48 MW	SFG48-56/6700	
	Nominal voltage	Nominal current	Power factor (lag)	
	13.8 kV	2114A	0.95	
	Nominal revolutions	Frequency		
	107.1 rpm	50 Hz		

The changes are permanent changes from the registered project activity and the project has never been implanted in accordance with the description in the registered PDD.

A2.2 Validation of the changes from the registered PDD

A2.2.1 Additionality of the project activity

Investment analysis was used for the demonstration of additionality in the registered PDD and was validated to be appropriate (/3/). The original models of the turbine and generator were sourced from the feasibility study report for the project. Parameters used in the investment analysis were reassessed considering the changes of the models of the turbines and generators. Details of the changes to the parameters are listed below:

Parameter	Registered PDD	Revised PDD
Static total investment	1,584,670,000 RMB	1,643,633,650 RMB
Annual power supply	954,088,000kWh	954,088,000kWh
Annual O & M Cost (first 10 years)	37,566,000 RMB	38,303,000 RMB
Annual O & M Cost (after 10 years)	32,796,000 RMB	33,533,000 RMB
Expected power price (incl. VAT)	0.227	0.227
Value Added Tax (VAT)	17%	17%
Expected power price (after deduction of VAT)	0.194 RMB/kWh	0.194 RMB/kWh
Project operation period	30 years	30 years
Bank loan financing	1,267,736,000 RMB	1,314,906,920 RMB
Interest on bank loan	5.76%	5.76%
Income tax rate	33%	33%
Urban Construction tax (% over VAT payments)	7%	7%
Education tax (% over VAT payments)	3%	3%
Expected CER price	8.5 EUR /tCO ₂ e	8.5 EUR /tCO ₂ e

The followings steps were taken to assess the impact of the change to each parameters used in the investment analysis:

1) For statics total investment:

The statics total investment used in the PDD was calculated based on the cost of main equipments and other related expenses such as construction, installation and compensation, etc as per FSR. The cost on the main equipment was increased as a result of the change while the other expenses were not affected. The price of the turbine and generator used by the project now (¥ 61,988,730) as per the equipment purchase agreement was higher than that estimated in the FSR (¥ 50,196,000). The equipment purchase contracts (/7/) and FSR were provided for validation. It was validated that the actual cost on the turbines and generators were higher than the prices in the FSR.

Unit of turbine and generator	Cost/unit (RMB)	No. of units	Total cost (RMB)	Increase (RMB)
Actual situation	61,988,730	5	309,943,650	58,963,650
Estimated value in FSR	50,196,000	5	250,980,000	

As a result of the increased cost from the turbine and generator, the statics total investment was changed from ¥ 1,584,670,000 in the registered PDD to ¥ 1,643,633,650 in the revised PDD which was validated to be consistent with actual situation.

2) For annual power supply

The annual power supply in the PDD was estimated based on the annual utilization hours and generators' capacity as per the FSR. The annual utilization hour was determined by an accredited third party after analyzing hydrological data from 1919 to 2000. The installed capacity of the generator was not changed though the model of the generator has changed. Thus, it is validated that the annual power supply is not affected by the change.

3) Annual O & M Cost

As per the FSR of the project, the O&M cost consists of overhaul cost, insurance cost, materials cost, reservoir maintenance fund, reservoir area late period support fund and other costs. The overhaul cost was determined to be 1% of the fixed assets while the insurance cost was 0.25%, and thus they were affected by the change since the statics total investment was increased. The other costs were either fixed or related to the annual power supply, and thus were not affected by the change. Details of the change of the O&M were as follows:

Item	Registered PDD		Revised PDD	
	First 10 years	Subsequent years	First 10 years	Subsequent years
Repairs and maintenance	¥ 21,466,000	¥ 21,466,000	¥ 22,203,000	¥ 22,203,000
Labour cost and staff welfare	¥ 3,414,000	¥ 3,414,000	¥ 3,416,000	¥ 3,416,000
Cost of materials used	¥ 1,200,000	¥ 1,200,000	¥ 1,200,000	¥ 1,200,000
Reservoir maintenance expenses	¥ 5,725,000	¥ 954,000	¥ 5,724,000	¥ 954,000
Other costs	¥ 5,760,000	¥ 5,760,000	¥ 5,760,000	¥ 5,760,000
Total annual O&M costs	¥ 37,566,000	¥ 32,796,000	¥ 38,303,000	¥ 33,533,000

4) Value Added Tax

The value added tax was determined as per related guidance from the government as per the FSR. Thus, this parameter is not affected by the change.

5) Power price

The power price in the FSR was determined with reference to related notice from local government (Notice from the National Development and Reform Commission on June 18th, 2004), which was also confirmed in the validation report of the project. It is thus validated the power price is not affected by the changes of the models of the turbine and generator.

6) Project operation period

The project operation period was determined to be 30 years as per the FSR. The operation period is not expected to be changed since the main equipments were produced by the same manufacturer and the specifications were not dramatically changed.

7) Bank loan financing

As per the FSR, the bank load financing was expected to be 80% of the static investment. Thus, the bank load financing was changed from ¥ 1,267,736,000 in the registered PDD to be ¥ 1,314,906,920 in the revised PDD.

8) Interest on bank loan

The Interest on bank loan was determined as per related guidance from the government in the FSR. It was not affected by the changes of the models of turbine and generator.

9) Income tax rate

The income tax rate was determined as per related guidance from the government in the FSR. It was not affected by the changes of the models of turbine and generator.

10) Urban Construction tax

The urban construction tax was determined as per related guidance from the government in the FSR. It was not affected by the changes of the models of turbine and generator.

11) Education tax

The education tax was determined as per related guidance from the government in the FSR. It was not affected by the changes of the models of turbine and generator.

PP recalculated the IRR for the project based on the updated parameters:.

	IRR without CDM revenues	IRR with CDM revenues
Actual situation	6.29%	9.21%
Registered PDD	6.56%	9.54%

The updated IRR calculation spreadsheet (/4/) has been checked and it has been validated that IRR was calculated in the same procedures as that in the registered PDD. The IRR without CDM revenue (6.29%) is lower than that in the registered PDD (6.56%) and the benchmark (8%). Thus, it is of SGS's opinion that the changes from the registered PDD have no impact on the additionality of the project activity.

A2.2.2 Scale of CDM project activity

The capacity of the turbine in the registered PDD was 48 MW while the actually installed capacity is 49 MW. PP clarified that the 48 MW in the registered PDD was a written mistake and it was actually 49 MW in the Feasibility Study Report (FSR) (/6/) which was the source of information in the registered PDD. The FSR was provided for validation. It is validated that the capacity of the turbine was 49 MW on page 72 of the FSR. Thus, the capacity of the turbine and generator of the project was not changed from the original project design. The other parameters of the turbine and generator in the registered PDD were validated to be originated from the FSR.

The total installed capacity of the project in the registered PDD was 240 MW. The actual installed capacity of the project is verified to be the same as that in the registered PDD. The project is still a large scale CDM project activity. Thus, it is of SGS's opinion that the changes from the registered PDD do not influence the scale of the CDM project activity.

A2.2.3 Applicability and application of the Applied Approved Baseline Methodology

The project was registered against the approved consolidated methodology: Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources, ACM0002 version 6. The change of the models of turbine and generator does not affect the applicability and application of the applied approved baseline methodology due to the following facts:

- 1) The project is still a grid-connected renewable power generation project using renewable hydro energy.

The Power Purchase Agreement and Grid Connection Agreement signed with the grid company (/8/) have been reviewed by the assessment team to confirm that the project is connected to Northwest China Power Grid.

- 2) The power density of the project is greater than 4 W/m².

The surface area at full reservoir level has been measured at the start of the project activity by Gansu Provincial Territorial Resources Planning Institute. The surface area at full reservoir level is 2,871,999.3 m² in the *surface area measuring report* (/9/) and the power density is 83.57 W/m², which is higher than 4 W/m². The accreditation certificate of the Gansu Provincial Territorial Resources Planning Institute (/10/) was also provided for validation.

- 3) The project does not involve switching from fossil fuels to renewable energy at the site of the project activity.

The project is a hydro power project with a new reservoir. It has been validated the project does not involve switching from fossil fuels to renewable energy.

- 4) The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.

The geographic and system boundaries of NWCPG can be clearly identified and information on the characteristics of the grid is publicly available. NWCPG includes Gansu, Ningxia, Shaanxi, Qinghai and Xinjiang power grids. Relevant information can be obtained from the website of Chinese DNA (/11/).

A.2.3. Validation opinion

In conclusion, it is SGS's opinion that the changes from the project activity as described in the registered PDD have no impact on the following aspects:

- (i) Additionality of the project activity;
- (ii) Scale of CDM project activity;
- (iii) Applicability and application of Approved Baseline Methodology under which the project activity has been registered.

A2.4 Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ Revised PDD version 3.0 dated 04 November 2009

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /2/ Registered PDD version 2.2 dated 10th February 2009
- /3/ Validation Report dated 10th February 2009
- /4/ Updated IRR calculation spreadsheet for the project
- /5/ Consolidated baseline methodology for grid-connected electricity generation from renewable sources, ACM0002, version 06 dated 19th May 2006
- /6/ Feasibility Study Report for the project
- /7/ Equipment Purchase Agreement signed between the supplier and the project owner
- /8/ PPA and Grid Connection Agreement signed with the grid company
- /9/ *Surface area measurement report* issued by the Gansu Provincial Territorial Resources Planning Institute
- /10/ Accreditation certificate of Gansu Provincial Territorial Resources Planning Institute.
- /11/ http://qhs.ndrc.gov.cn/qjzjz/t20090703_289357.htm (website of the Chinese DNA)

A.3 Appendix 3: Findings Overview

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	3	2	0

Date:	31/07/2009	Raised by:	Michael Wu & Yolanda Zheng		
Type:	CL	Number:	CL #1	Reference:	1
Lead Assessor Comment:			Date: 31/07/2009		
Requirements of VCS PD 1.12, 1.13, 1.14, 8.1 and 8.2 were not covered in the monitoring report version 01. Please address these clauses in the MR and provide related evidences.					
Project Participant Response:			Date: 04/01/2010		
Clauses were addressed in the revised MR according to the mentioned VCS requirements. Related evidences were provided to the verifier as well.					
Documentation Provided as Evidence by Project Participant:					
Evid-1. Statement with regard to the Voluntary Emission Reductions generated by the Gansu Huanghe Bingling Hydropower Station Project issued by <i>Gansu Diantou Bingling Hydropower Development Co., Ltd</i>					
Evid-2. Copy of Business License					
Evid-3. Copy of Equipment Purchase agreement					
Information Verified by Lead Assessor:					
Clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of VCS PD were addressed in the monitoring report version 2.0. Related evidences have been provided and reviewed. It has been validated that the project meets the requirement of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of VCS PD and is qualified as a VCS project.					
Reasoning for not Acceptance or Acceptance and Close Out:					
CL #1 is closed.					
Acceptance and Close out by Lead Assessor:			Date: 05/01/2010		

Date:	31/07/2009	Raised by:	Michael Wu & Yolanda Zheng		
Type:	CAR	Number:	CAR #2	Reference:	1
Lead Assessor Comment:				Date: 31/07/2009	
The types of the hydro turbines and generators installed at the project site were verified to be different from the types indicated in page 5 of the registered PDD. Please clarify the changes including when the changes occurred and reasons for these changes and revise the PDD to be in compliance with the actual situation.					
Project Participant Response:				Date: 04/01/2010	
Turbine type number, generator type number and some other technical parameters in the registered PDD of this project are designed parameters cited from the project's Feasibility Study Report (hereinafter referred to as FSR), made by China State Electric Power Corporation North West Survey and Design Institute (hereinafter mentioned as Institute). The FSR was issued August 2004.					
The actually implemented parameters that were verified onsite are different from described in the PDD and these differences are showed in the table below:					
Parameters	In registered PDD	Actual implementation	Manufacturer		
Turbines type number	GZ (741)-WP-625	GZ HK-1RT-WP-620	Ha'erbin Electric Machinery Co., Ltd		
Turbine capacity	48 MW	49 MW			
Turbine nominal water flow	332 m³/s	335 m³/s			
Turbine run-away rotation speed	267.8 rpm	330 rpm			
Generator type number	SFWG48-56/	SFG48-56/6700			

When the Institute was writing type selection section in FSR, technical parameters of the turbine-generators were determined on in the first place by the Institute. Then based on their needed technical parameters the

Institute looked for appropriate turbine-generator in product inventories that they had at hand which were provided by certain equipment manufacturers for the Institute's reference. Once a turbine-generator with the Institute's required technical parameter in the inventory was found and this designed scheme was chosen as the referenced equipment and was written in the FSR together with its type number and some of its technical parameters.

Since hydraulic turbines and generators are not standardized in China (there is no standard where type number and corresponding specifications are well defined), when they are manufactured their type numbers and some specifications would be slightly modified or reset, thus the actual type number and certain parameters of the implemented equipments would be slightly different from those in the FSR. This is a common practise and will not impact equipments' performance. Therefore though actual type number is not same as described in registered PDD, the rated generation capacity in registered PDD and in actual implementation do not differ from each other.

The Turbine capacity mentioned in the PDD was 48 MW and it was written by mistake which should have been 49 MW according to FSR.

Besides, the actual price of the main equipment in the Equipment Purchase Contract is 61,988,730 Yuan RMB per unit of turbine-generator while the price estimated in FSR is 50,196,000 Yuan RMB. The table below gives details of the difference between actual cost and the estimated cost of turbine-generators.

Items	Cost/unit (Yuan RMB)	No. of units of turbine- generator	Total cost (Yuan RMB)	Cost difference (Yuan RMB)	IRR without CDM revenues	IRR with CDM revenues
Actual implemented based on the Equipment Purchase Contract	61,988,730	5	309,943,650	58,963,650	6.27%	9.18%
Estimated value in FSR	50,196,000	5	250,980,000		6.56%	9.54%

It can be seen from the table that the IRR with actual equipment cost taken into account is lower than the one in registered PDD and is also lower than the benchmark 8% indicated in registered PDD. Thus changes of type number of turbine-generator do not impact additionality of the project.

Furthermore, the installed capacity that is actually implemented is 240 MW and the rated generation capacity does not change, which is well consistent with described in registered PDD. Therefore the scale of project activity is not impacted.

Finally, the project still meets all the applicability criteria stated in the methodology applied ACM 0002 (version 6) given the above changes. Therefore the changes do not impact Applicability and application of Approved Baseline Methodology under which the project activity has been registered.

Documentation Provided as Evidence by Project Participant:

- Evid-4. Revised PPD both in track changes and PDF version.
- Evid-5. Pages where indicated turbine-generator type number, equipment price and other corrected parameters in the FSR.
- Evid-6. Pages where indicated turbine-generator type number and equipment price in the Equipment Purchase Contract
- Evid-7. Registered IRR calculation spreadsheet
- Evid-8. Revised IRR calculation spreadsheet

Information Verified by Lead Assessor:

The reason for the change was clarified and the PDD was revised according to the actual implementation status.	
The impact of the changes to the (i) additionality of the project activity; (ii) scale of CDM project activity; (iii) applicability and application of Approved Baseline Methodology under which the project activity has been registered have been discussed and validated. In our opinion, the changes from the project activity as described in the registered PDD have no impact on the three aspects mentioned above.	
Details of the validation please refer to Annex 2 of the verification report.	
Reasoning for not Acceptance or Acceptance and Close Out:	
CAR #2 is closed.	
Acceptance and Close out by Lead Assessor:	Date: 05/01/2010

Date:	31/07/2009	Raised by:	Michael Wu & Yolanda Zheng		
Type:	CL	Number:	CL #3	Reference:	3 – 1.1
Lead Assessor Comment:			Date: 31/07/2009		
The calibration information of the meters monitored by the grid company (M3a, M3b and M5 as indicated in the registered PDD) was not reported in the monitoring report version 1. Please present the calibration information in the MR and provide related evidences.					
Project Participant Response:			Date: 04/01/2010		
Calibration information of M3a, M3b and M5 were added to the revised monitoring report. Related evidence is provided to the DOE.					
Documentation Provided as Evidence by Project Participant:					
Evid-9. Calibration report of M3a dated 19 th Sep 2007 and 10 th July 2008.					
Evid-10. Calibration report of M3b dated 21 st March 2008 and 20 th March 2009					
Evid-11. Calibration report of previously used M5 (SN 0019179) dated 16 th Feb 2008.					
Evid-12. Calibration report of currently used M5 (SN 00487911) dated 17 th Feb 2009					
Evid-13. M5 replacement record dated 17 th March 2009 issued by Yongjing County Quality and technical supervision Bureau					
Evid-14. Metrological Authorization Certificate of Yongjing County Quality and technical supervision Bureau with validation from 29 th Dec. 2005 to 28 th Dec. 2010					
Information Verified by Lead Assessor:					
Calibration information of M3a, M3b and M5 was provided in the monitoring report version 2.0. Related calibration reports and qualification certificate of the calibration entity have been reviewed. It was confirmed that all the meters have been annually calibrated by qualified third party as per the requirement of the monitoring plan.					
Reasoning for not Acceptance or Acceptance and Close Out:					
CL #3 is closed.					
Acceptance and Close out by Lead Assessor:			Date: 05/01/2010		

Date:	31/07/2009	Raised by:	Michael Wu & Yolanda Zheng		
Type:	CAR	Number:	CAR #4	Reference:	3 – 1.1
Lead Assessor Comment:				Date: 31/07/2009	
The reported PO's data of electricity supplied to the grid by the project in November 2008 (20,936.520 MWh) and reported Grid's data of electricity imported from the grid in January 2009 (101.664 MWh) in MR version 1 were verified to incorrect. CAR #4 was raised in this regard.					
Project Participant Response:				Date: 04/01/2010	
The value of electricity supplied by the project to the grid through the main power line (ES _y) of PO data is obtained according to:					
$ES_y = ES_{M2a} + ES_{M2b}$					
Where:					
<i>ES_{M2a}</i> : electricity supplied by the project to the grid measured by meter M2a (MWh),					
<i>ES_{M2b}</i> : electricity supplied by the project to the grid measured by meter M2b (MWh).					
<i>ES_{M2a}</i> and <i>ES_{M2b}</i> are calculated by multiplying the meter's ratio by the difference between the end reading (reading at 24:00 on the last day) and the beginning reading (reading at 0:00 on the 1 st day) of the meter during the period considered. The formula can be showed below:					

$ES_{M2a} = M2a \text{ ratio} * (\text{End reading}_{M2a} - \text{Start reading}_{M2a}),$
 $ES_{M2b} = M2b \text{ ratio} * (\text{End reading}_{M2b} - \text{Start reading}_{M2b});$
 Thus, to calculate the value of electricity supplied by the project to the grid through the main power line (ES_y) of PO data in November 2008, the start readings and end readings of M2a and M2b shall be used. The start reading of M2a is that at 0:00 of 1st November 2008. As to M2b, since it started to be used on 20th November 2008, the start reading of M2b is that at 0:00 of 20th Nov. 2008 which was 0.016. It was mistakenly considered as 0 in the initial version of MR and ER calculation spreadsheet. Correction was made.
 The difference between the reported value and verified value of ES_y resulted from the mistake made when preparing the MR and ER calculation spreadsheet:
 The start reading of M2b on 1st November 2008 (M3a's reading at 0:00 on 1st November 2008) was wrongly considered as 0 while in fact it is 0.016. The daily log of M2b on 20th November 2008 is provided as evidence to the verifier as Evid 15.
 Besides, the grid data in total of power received from the grid by the project in January 2009 was actually 104.664 instead of 101.664 in the initial version of the MR. It was a typo error when drafting the initial version of MR.
 The project entity and consultants realized these mistakes when reviewing the original data/records of Bingling Hydropower Station Project after SGS issued this CAR in their findings. The data were corrected in the revised MR v 2.0.
 Both of the project entity and consultants will enhance the QA/QC in future's preparation of monitoring report.

Documentation Provided as Evidence by Project Participant:					
Evid-15 Meter M3a's log on 1 st November 2009					
Information Verified by Lead Assessor:					
It was verified that the data were corrected to be (20,894.280 MWh and 104.664 MWh) in the monitoring report version 2.0. It is confirmed that the data in the MR version 2.0 are consistent with data sources. The calculation of EGy has been checked to be correct.					
Reasoning for not Acceptance or Acceptance and Close Out:					
CAR #4 was closed.					
Acceptance and Close out by Lead Assessor:				Date: 05/01/2010	

Date:	31/07/2009		Raised by:	Michael Wu & Yolanda Zheng	
Type:	CAR	Number:	CAR #5	Reference:	1
Lead Assessor Comment:				Date: 31/07/2009	
The operational hours of emergency back-up diesel generator in the MR version 1 is verified to be different from the data verified by the assessors. Correction is requested.					
Project Participant Response:				Date: 04/01/2010	
The operational hours of back-up diesel generator in the MR version 1 was filled in the MR by mistake. The actual number of operational hours of the backup diesel generator was 6.33. This figure was corrected in the MR.					
PP will enhance internal quality control to avoid occurrence of such mistakes in the future.					
Documentation Provided as Evidence by Project Participant:					
Evid-16. Electronic records of Bingling hydropower station diesel generator operational hours					
Information Verified by Lead Assessor:					
The operational hours of back-up diesel generator was revised in the monitoring report version 2.0. The reported data in the revised MR was verified to be consistent with the data in the operational log of the diesel generator.					
Reasoning for not Acceptance or Acceptance and Close Out:					
CAR #5 was closed.					
Acceptance and Close out by Lead Assessor:				Date: 05/01/2010	

A.4 Appendix 4: Competency statements of team members

Statement of Competence

Name: Jiang, Ginger

SGS Affiliate: SGS China

Status

- Lead Assessor	☒	- Expert	☒
- Assessor	☒	- Financial Expert	☐
- Local Assessor	☒	- Technical Reviewer	☐

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	☒
<i>Sub scope(s): Hydro, Wind</i>	
2. Energy Distribution	☐
<i>Sub scope(s):</i>	
3. Energy Demand	☐
<i>Sub scope(s):</i>	
4. Manufacturing	☐
<i>Sub scope(s):</i>	
5. Chemical Industry	☐
<i>Sub scope(s):</i>	
6. Construction	☐
<i>Sub scope(s):</i>	
7. Transport	☐
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	☐
<i>Sub scope(s):</i>	
9. Metal Production	☐
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	☐
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	☐
<i>Sub scope(s):</i>	
12. Solvent Use	☐
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	☒
<i>Sub scope(s): Landfill Gas</i>	
14. Afforestation and Reforestation	☐
<i>Sub scope(s):</i>	
15. Agriculture	☐
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

04/11/2009

Statement of Competence

Name: **Wu, Michael** SGS Affiliate: **SGS China**

Status

- Lead Assessor	☒	- Expert	☒
- Assessor	☒	- Financial Expert	☐
- Local Assessor	☒	- Technical Reviewer	☐

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	☐
<i>Sub scope(s):</i>	
2. Energy Distribution	☐
<i>Sub scope(s):</i>	
3. Energy Demand	☐
<i>Sub scope(s):</i>	
4. Manufacturing	☐
<i>Sub scope(s):</i>	
5. Chemical Industry	☒
<i>Sub scope(s): Adipic acid production, Nitric Acid or Caprolactam Production</i>	
6. Construction	☐
<i>Sub scope(s):</i>	
7. Transport	☐
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	☐
<i>Sub scope(s):</i>	
9. Metal Production	☐
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	☐
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	☐
<i>Sub scope(s):</i>	
12. Solvent Use	☐
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	☐
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	☐
<i>Sub scope(s):</i>	
15. Agriculture	☐
<i>Sub scope(s):</i>	

Approved Member of Staff by: **Siddharth Yadav** Date: **04/11/2009**

Statement of Competence

Name: Zheng, Yolanda

SGS Affiliate: SGS China

Status

- Lead Assessor	☐	- Expert	☒
- Assessor	☒	- Financial Expert	☐
- Local Assessor	☒	- Technical Reviewer	☐

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	☒
<i>Sub scope(s): Hydro, Wind</i>	
2. Energy Distribution	☐
<i>Sub scope(s):</i>	
3. Energy Demand	☐
<i>Sub scope(s):</i>	
4. Manufacturing	☐
<i>Sub scope(s):</i>	
5. Chemical Industry	☐
<i>Sub scope(s):</i>	
6. Construction	☐
<i>Sub scope(s):</i>	
7. Transport	☐
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	☐
<i>Sub scope(s):</i>	
9. Metal Production	☐
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	☐
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	☐
<i>Sub scope(s):</i>	
12. Solvent Use	☐
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	☐
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	☐
<i>Sub scope(s):</i>	
15. Agriculture	☐
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

05/11/2009

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.

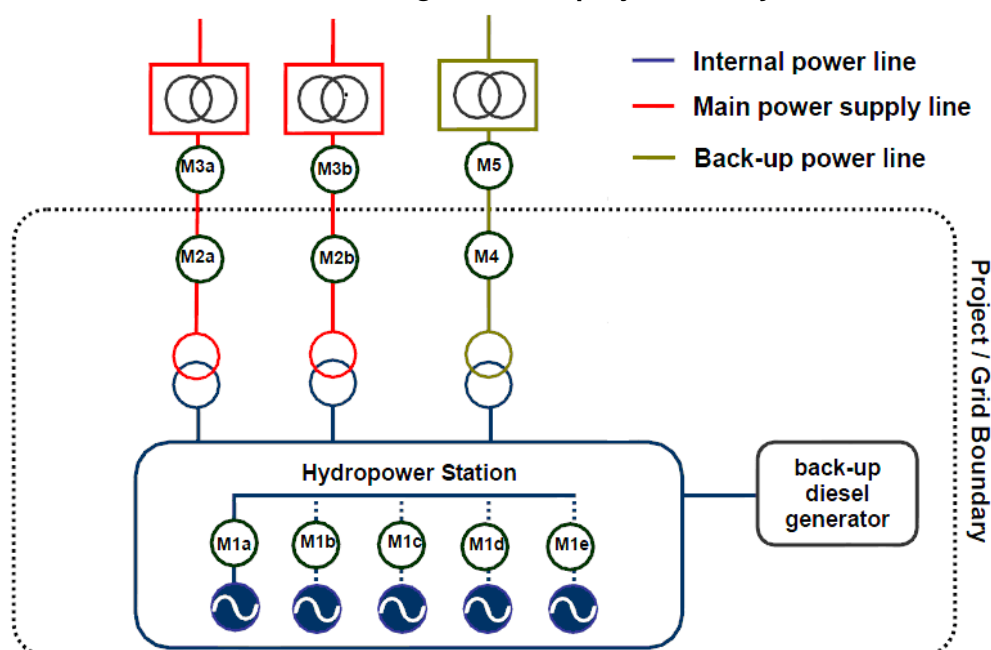
The grid company settled the power supply to the grid from the project as well as power imported by the project from the grid on sales receipts or statements and these electricity sold records were given to the project entity each month to cross check.

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 calibration	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			Conservative value
		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)	
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:

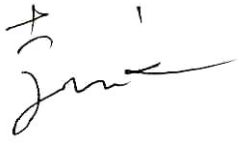
Turbine-generator unit Number	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Power supply start date	8 th Jan 2009	8 th , Dec. 2008	7 th July. 2009	23 rd , May 2009	4 th Aug. 2008
Length of time the unit is operational for until end date of the monitoring period (11 th Feb 2009)	1 month	2 months	not operational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



A.6 Appendix 6: Revised sections of the registered PDD

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

CONTENTS

- A. General description of project activity
- B. Application of a baseline and monitoring methodology
- C. Duration of the project activity / crediting period
- D. Environmental impacts
- E. Stakeholders' comments

Annexes

- Annex 1: Contact information on participants in the project activity
- Annex 2: Information regarding public funding
- Annex 3: Baseline information
- Annex 4: Monitoring plan

**SECTION A. General description of project activity****A.1 Title of the project activity:**

Project title: Gansu Huanghe Bingling Hydropower Station Project

PDD Version: 3.0

Completion date PDD: 04/11/2009

Revision History:

Version 1.0: Submitted for validation / global stakeholder comments

Version 2.0: Revised version / amendments in response to validation findings

Version 2.1: Revised version / amendments in response to EB completeness check findings

Version 2.2: Revised version / amendments in response to Request for Review based on minor issues

Version 3.0: Revised version / amendments in response to the first periodic verification findings

A.2. Description of the project activity:

Same as registered PDD

A.3. Project participants:

Same as registered PDD

A.4. Technical description of the project activity:

Same as registered PDD

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

The technology is standard hydropower technology which is sourced domestically and is appropriate for the development level of the region in which the project is located.

The project consists of a new hydro-electric facility with a low/medium head of 16.1 meters with limited storage capacity. The technology employed in the project is a conventional integrated dam-powerhouse design using the natural water flow of the river and low/medium water head.

The structure consists of a dam structure with a maximum height of 61 meters. The dam structure is composed of left and right water retaining concrete gravity dams and a central dam section. The central dam section is integrated with the power house structure which will be constructed at the base of the dam which allows the turbines to be installed in the river bed. The central dam structure furthermore includes 5 surface flood gates which will be constructed at the upper part of the dam and 3 sand sluices which are used to flush sand accumulated in the reservoir.

The hydropower station has limited active storage capability (less than one day). The reservoir will have a total surface area of 4,640,000 m². The power density of the project is 51.7 W/m² (see section B. for the calculation).



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The choice of turbines for this project reflects the low/medium head nature of the project. The turbines that will be installed are integrated bulb-type propeller turbines that are suitable for larger hydropower schemes with medium head. The project will install five turbine/generator sets with an individual capacity of 48 MW. The specific technical data of the turbines / generators are listed in Table A.2. The units will be manufactured by by Ha'erbin Electric Machinery Co., Ltd.

Table A.2 Technical data of the turbine / generator units (specifications are per unit)

Turbine	Type	Type number	Capacity	
	Bulb-type propeller	GZ HK-1RT-WP-620	49 MW	
	Nominal water flow	Water head		
		Minimum	Nominal	Maximum
	335 m3/s	11.6 m	16.1 m	25.7 m
	Nominal revolutions		Run-a-way rotation speed	
	107.1 rpm		300 rpm	
Generator	Type	Capacity	Type number	
	Horizontal integrated (in turbine bulb)	48 MW	SFG48-56/6700	
	Nominal voltage	Nominal current	Power factor (lag)	
	13.8 kV	2114A	0.95	
	Nominal revolutions	Frequency		
	107.1 rpm	50 Hz		

The project will also involve the construction of an on-site sub-station that will connect the Gansu Huanghe Bingling Hydropower Station Project to the grid through two feed-out lines. The project is connected by a 330 kV line to the Liujiaxia 330kV Switching Station and through a 110 kV power line to the 110kV Jishishan Transformer Station which both are connected to the Gansu Provincial Power Grid which is part of the North West China Power Grid.

Training and maintenance requirements:

The project entity has made arrangements for its staff to become familiar with the operation and maintenance requirements of a hydropower station. Staff of the project entity attended / will attend the below training sessions in order to operate and maintain the proposed project activity:

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:**

Same as registered PDD

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

Same as registered PDD

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

Same as registered PDD

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

Same as registered PDD

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):

The additionality of the project activity is demonstrated using the steps described in the 'Tool for the demonstration and assessment of additionality' (version 05). See UNFCCC website:

http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Same as registered PDD-

Step 2. Investment analysisSub-step 2a: Determine appropriate analysis method

The analysis will be analyzed through Option III of the additionality tool, i.e. benchmark analysis. This method is applicable because:

- Option I: Simple cost analysis, does not apply as the project generates economic returns through the sales of electric power to the grid.
- Option II: Investment comparison analysis is the returns of investing in the construction of one of the other identified alternatives did not play a role in the decision to go ahead with the proposed project activity.
- Option III: Benchmark analysis is used as the return on investment relative to the industry benchmark was crucial for the decision to go ahead with the project.

Conclusion: We conclude that option III is applicable to the project activity.

Sub-step 2b – Option III: Apply benchmark analysis

The project faces a barrier to implementation due to the poor returns on investment. To illustrate this, we performed a benchmark analysis in which calculate the Internal Rate of Return (IRR) of the project and compare this with a benchmark stated in the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, issued by the State Power Corporation of China. This publication provides an 8% Internal Rate of Return (IRR) benchmark as a guideline for investments in the power sector. The IRR is defined as a project IRR based on cash in- and outflows only, and does not take into account the source of financing.

Sub-step 2c: Calculation and comparison of financial indicators

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For the calculation of the financial indicators for the proposed hydropower project, we use the parameters listed in Table B.2. For the parameters for the Gansu Huanghe Bingling Hydropower Station Project realistic values at the time of the investment decision have been chosen.

The total investment, annual power supply, the annual operation and maintenance costs (O&M costs), expected power price are from the Feasibility Study. The investment horizon is assumed to be 30 years which is a common period for evaluation of larger investment projects in the power sector and in accordance with the feasibility study.

Table B.2 Parameters used in the calculation of the IRR

Gansu Huanghe Bingling Hydropower Station Project		
Parameter	Value	Source
Static total investment	1,643,633,650 RMB	Feasibility study and main equipment purchase contract
Annual power supply	954,088,000kWh	Feasibility study
Annual O & M Cost (first 10 years)	38,303,000 RMB	Feasibility study
Annual O & M Cost (after 10 years)	33,533,000 RMB	Feasibility study
Expected power price (incl. VAT)	0.227	Feasibility study
Value Added Tax (VAT)	17%	Standard tax rate
Expected power price (after deduction of VAT)	0.194 RMB/kWh	Feasibility study / calculated from above
Project operation period	30 years	Feasibility study
Bank loan financing	1,314,906,920 RMB	Feasibility study
Interest on bank loan ²	5.76%	Feasibility study
Income tax rate	33%	Standard tax rate
Urban Construction tax (% over VAT payments)	7%	Standard tax rate
Education tax (% over VAT payments)	3%	Standard tax rate
Expected CER price	8.5 EUR /tCO ₂ e	Assumed market price

Table B.3 provides a breakdown of the annual O&M cost for the sake of transparency.

Table B.3 Breakdown of annual O&M costs

Breakdown of annual O&M cost		
Item	First 10 years	Subsequent years
Repairs and maintenance	22,203,000 RMB	22,203,000 RMB
Labour cost and staff welfare	3,416,000 RMB	3,416,000 RMB
Cost of materials used	1,200,000 RMB	1,200,000 RMB
Reservoir maintenance expenses	5,724,000 RMB	954,000 RMB
Other costs	5,760,000 RMB	5,760,000 RMB
Total annual O&M costs	38,303,000 RMB	33,533,000RMB

² In this PDD, the information on bank loan repayment and interest rate is used only to calculate income tax payments, which are determined on the basis of net income (i.e. after deduction of interest payments and capital depreciation). Note that for the calculation of the Internal Rate of Return we do not deduct interest payments and capital depreciation charges from gross cash flows as the IRR is calculated as a project IRR, which does not take into account the source of financing other than through the impact of financing on tax payments.

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The investment analysis compares the internal rate of return (IRR) of the project with the benchmark defined in sub-step 2b. The main results of the investment analysis are presented in Table B.4, where the IRR for the Gansu Huanghe Bingling Hydropower Station Project has been calculated with and without CDM revenues.

Table B.4 Main results of the IRR calculations

Scenario	IRR
Project without revenues from the sale of CERs	6.29%
Project with CER revenues (at 8.5 EUR / tCO ₂)	9.21%

From the results in Table B.3 it is clear that the return on investment for the Gansu Huanghe Bingling Hydropower Station Project without the revenues from the sales of CERs is considerably lower than the 8% benchmark that applies to hydropower stations of this scale. This demonstrates that the proposed project activity is not a commercially viable option to supply power. The detailed spreadsheet calculations are available to the validator.

Sub-step 2d: Sensitivity analysis

The “Tool for the demonstration and assessment of additionality” requires that a sensitivity analysis is conducted to check whether the financial attractiveness remains unaltered for reasonable variations in the critical assumptions. The following parameters were used as critical assumptions:

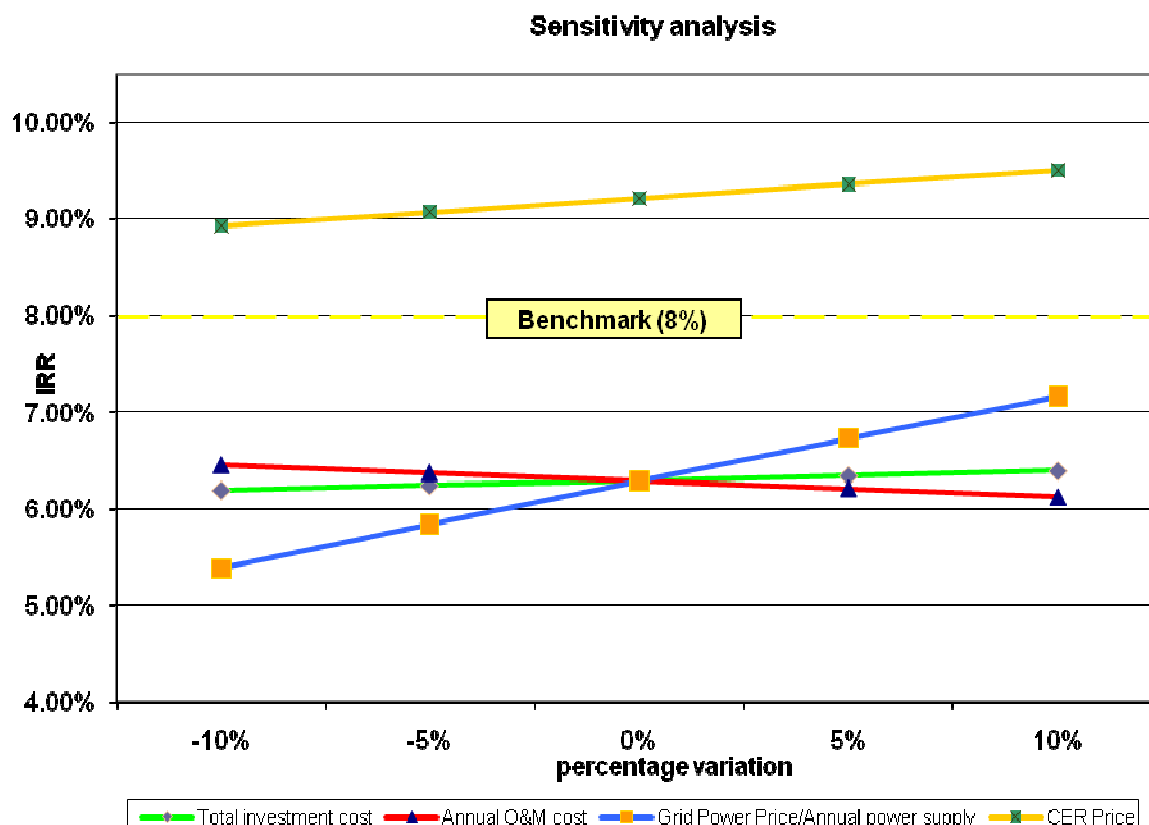
- Grid price
- Static total investment
- Annual O&M costs
- Annual power supply
- CER Price

In the sensitivity analysis, variations of $\pm 10\%$ have been considered in the critical assumptions. The results of the sensitivity analysis for the IRR are shown in Table B.5, while Figure B.2 provides a graphic depiction.

Table B.5 Results of the sensitivity analysis – impact of variations in critical assumptions on IRR.

Percentage Variation	-10%	-5%	0%	+5%	+10%
Critical assumption					
Total investment	6.19%	6.24%	6.29%	6.34%	6.39%
Annual Power Supply	5.44%	5.87%	6.29%	6.70%	7.10%
Annual O&M Cost	6.45%	6.37%	6.29%	6.21%	6.12%
Grid price	5.38%	5.84%	6.29%	6.73%	7.16%
CER Price (IRR with CDM revenues)	8.93%	9.07%	9.21%	9.36%	9.50%

Figure B.2 Results of the sensitivity analysis



The sensitivity analysis of the Internal Rate of Return confirms that the proposed project after realistic modifications to the critical assumptions remains commercially non viable. The Internal Rate of Return of the proposed project activity remains below the 8% benchmark.

The conclusion may be clear that with reasonable modifications in the critical assumptions, the main results remain unaltered. The results of the sensitivity analysis therefore confirm that the project faces significant economic barriers.

Step 3. Barrier analysis

Same as registered PDD

Step 4. Common practice analysis

Same as registered PDD

B.6. Emission reductions:

Same as registered PDD

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

Same as registered PDD

SECTION C. Duration of the project activity / crediting period

Same as registered PDD



SECTION D. Environmental impacts

Same as registered PDD

SECTION E. Stakeholders' comments

Same as registered PDD

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