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Validation Report

Carbon Asset Management Sweden AB

VALIDATION OF THE CDM-PROJECT:
CHINA TONGWAN HYDROPOWER PROJECT

REPORT NO. 988805

2008 January 24

TÜV SÜD Industrie Service GmbH

Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

Industrie Service

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Subject: Validation of a CDM Project

Accredited TÜV SÜD Unit:	**TÜV SÜD Contract Partner:**
TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 - 80686 Munich Federal Republic of Germany	Jiangsu TÜV Product Service Ltd. Shenzen branch Room A01, B01 & B02, 28th Anlian Building No. 4018 Jintian Road 518026 Shenzhen, China
Client: Carbon Asset Management Sweden AB Drottninggatan 92-94, 111 36 Stockholm, Sweden	**Project Site(s):** located at Tongwan Town, Zhongfang County, Huaihua City, Hunan Province, P.R.China. The project is 49 km away from Huaihua City. The geographical coordinates of project are 110°17'19" E and 27°35'02" N.

Project Title:	China Tongwan Hydropower Project		
Applied Methodology / Version:	ACM0002 / version 06	**Scope(s):**	1

First PDD Version:		**Final PDD version:**	
Date of issuance:	2007-01-27	Date of issuance:	2008-05-21
Version No.:	04	Version No.:	06
Starting Date of GSP	2007-03-02		

Estimated Annual Emission Reduction:	633 945 tons CO_{2e}

Assessment Team Leader:	**Further Assessment Team Members:**
Dr. Sven Kolmetz	Mr. Carl Zhou

Summary of the Validation Opinion:

☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board in case letters of approval of all Parties involved will be available before the expiring date of the applied methodology(ies) or the applied methodology version respectively.

☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. Hence TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board on this decision.

Abbreviations

ACM	Approved Consolidated Methodology
AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
GHG	Greenhouse gas(es)
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organisation
PDD	Project Design Document
PP	Project Participant
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The validation objective is an independent assessment by a Third Party (Designated Operational Entity = DOE) of a proposed project activity against all defined criteria set for the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and will finally result in a conclusion by the executing DOE whether a project activity is valid and should be submitted for registration to the CDM-EB. The ultimate decision on the registration of a proposed project activity rests at the CDM Executive Board and the Parties involved.

The project activity discussed by this validation report has been submitted under the project title:

China Tongwan Hydropower Project

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities the scope is set by:

- Ø The Kyoto Protocol, in particular § 12
- Ø Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Ø Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Ø Decisions by the EB published under http://cdm.unfccc.int
- Ø Specific guidance by the EB published under http://cdm.unfccc.int
- Ø Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodlogy (CDM-NM)
- Ø The applied approved methodology
- Ø The technical environment of the project (technical scope)
- Ø Internal and national standards on monitoring and QA/QC
- Ø Technical guideline and information on best practice

The validation 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.

Once TÜV SÜD receives a first PDD version, it is made publicly available on the internet at TÜV SÜD's webpage as well as on the UNFCCC CDM-webpages for starting a 30 day global stakeholder consultation process (GSP). In case of any request a PDD might be revised (under certain conditions the GSP will be repeated) and the final PDD will form the basis for the final evaluation as presented by this report. Information on the first and on the final PDD version is presented at page 1.

The only purpose of a validation is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual, an initiative of Designated and Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customised for the project. TÜV SÜD developed a "cook-book" for methodology-specific checklists and protocol based on the templates presented by the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), the discussion of each criterion by the assessment team and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below.

The completed validation protocol is enclosed in Annex 1 to this report.

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	***Reference***	***Comments***	***PDD in GSP***	***Final PDD***
The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further subdivided. The lowest level constitutes a checklist question / criterion.	*Gives reference to documents where the answer to the checklist question or item is found in case the comment refers to documents other than the PDD.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached. In some cases sub-checklist are applied indicating yes/no decisions on the compliance with the stated criterion. Any* ***Request*** *has to be substantiated within this column*	*Conclusions are presented based on the assessment of the first PDD version. This is either acceptable based on evidence provided (þ),* ***or a Corrective Action Request (CAR)*** *due to non-compliance with the checklist question (See below).* ***Clarification Request (CR)*** *is used when the validation team has identified a need for further clarification.*	*Conclusions are presented in the same manner based on the assessment of the final PDD version.*

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	***Ref. to table 1***	***Summary of project owner response***	***Validation team conclusion***
If the conclusions from table 1 are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 1 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the client or other project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 1, under "Final PDD".*

In case of a denial of the project activity more detailed information on this decision will be presented in table 3.

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	***Id. of CAR/CR 1***	***Explanation of the Conclusion for Denial***
If the final conclusions from table 2 results in a denial the referenced request should be listed in this section.	*Identifier of the Request.*	*This section should present a detail explanation, why the project is finally considered not to be in compliance with a criterion.*

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body ensuring that the required skills are covered by the team. The Certification Body TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Ø Assessment Team Leader (ATL)
- Ø Greenhouse Gas Auditor (GHG-A)
- Ø Greenhouse Gas Auditor Trainee (T)
- Ø Experts (E)

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team.

The validation team was consisting of the following experts (the responsible Assessment Team Leader in written in bold letters):

Name	Qualification	Coverage of technical scope	Coverage of sectoral expertise	Host country experience
Dr. Sven Kolmetz	**ATL**	þ	þ	þ
Mr. Carl Zhou	GHG-A	þ		þ

Dr. Sven Kolmetz is physicist and auditor at the department "TÜV Carbon Management Service" located in the head office of TÜV SÜD IS GmbH in Munich. Furthermore he is officially authorized expert in the verification of GHG emissions in the framework of the European Emission Trading Scheme. Before entering TÜV SÜD he worked as energy consultant for industrial companies and as consultant for the German Federal Government on instruments for the reduction of GHG emissions.

Mr. Carl Zhou is an environmental engineer and an auditor for environmental management systems (according to ISO 14001) at Jiangsu TUV Product Service Ltd. He is based in Shenzhen. In his position he is responsible for the implementation of validation, verification and certifications audits for management systems. He has received training in the CDM validation process and participated already in several CDM project assessments.

2.2 Review of Documents

The first PDD version submitted by the client and additional background documents related to the project design and baseline were reviewed as initial step of the validation process. A complete list of all documents and proofs reviewed is attached as annex 2 to this report.

2.3 Follow-up Interviews

In the period of July 11th, 2007 TÜV SÜD performed interviews on-site with project stakeholders to confirm selected information and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in the context of this on-site visit.

Name	Organisation
Mr. Shi Xuanling	Hongjiang city government
Ms. Song Zhengrong	Zhongfang county government
Mr. Zhou Hua	Zhongfang county government
Mr. Qu Jie	Zhongfang county government
Mr. Liu Anchang	Zhongfang county government
Mr. Xiang Pusu	Zhongfang county government

Mr. Yang Wenchang	Zhongfang county government
Mr. Ling Haiquan	Hunan province water power design institute
Mr. Bu Jikan	Hunan province water power design institute
Mr. Wu Yuehong	Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd.
Mr. Shu Keyou	Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd.
Mr. Zhan Xiaolong	Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd.
Mr. Bai Xiaohong	Xiangyi resettlement supervision company
Mr. Yu Qingdong	Xiangyi resettlement supervision company
Mr. Li Leyong	Hunan province CDM centre
Mr. Xie Lei	Carbon Asset Management Co. Ltd
Miss Xuman	Carbon Asset Management Co. Ltd
Miss Yang Mingming	Carbon Asset Management Co. Ltd
Mr. Xu Hengzhi	Hunan province CDM centre
Mr. Zhang Haiwen	Hunan province CDM centre
Miss Zou Zhifang	Hunan province CDM centre
Mr. Zhou Ruhong	Tongwan town Xinghua village
Mr. Xiao Xiaoming	Tongwan town Xinghua village
Mr. Zhang Changfu	Tongwan town Xinghua village
Mr. Tian Xiaohua	Tongwan town government
Mr. Zhou Qiqian	Tongwan town government
Mr. Zhou Zilian	Tongwan town Dayantou village
Mr. Zhou Nanfang	Tongwan town Dujiangpo village

2.4 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions and clarifications and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are summarised in chapter 3 below and documented in more detail in the validation protocol in annex 1.

2.5 Internal Quality Control

As final step of a validation the validation report and the protocol have to undergo an internal quality control procedure by the Certification Body “climate and energy”, i.e. each report has to be approved either by the head of the certification body or his deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one.

It rests at the decision of TÜV SÜD’s Certification Body whether a project will be submitted for requesting registration by the EB or not.

3 SUMMARY OF FINDINGS

As informed above all findings are summarized in table 2 of the attached validation protocol.

History of the validation process

The audit team has been provided with a draft PDD in January 2007. Based on this documentation a document review and a fact finding mission in form of an on-site audit has taken place. Afterwards the client decided to revise the PDD according to the CARs and CRs indicated in the audit process. The final PDD version submitted in October 2007 serves as the basis for the assessment presented herewith. Changes are not considered to be significant with respect to the qualification of the project as a CDM project based on the two main objectives of the CDM to achieve a reduction of anthropogenic GHG emissions by sources and to contribute to sustainable development.

Project description

The following description of the project as per the PDD could be verified during the on-site audit.

China Tongwan Hydropower Project is a new-built medium scale hydropower project, locating on Yuanshui River, Zhongfang County, Huaihua City, Hunan Province, P. R. China. The total installed capacity of the project will be 180 MW, the annual utilization time will be 3,950 h, and the annual net electricity generation will be 662,000 MWh. The surface area at the full reservoir level of the project will be 12 km^2, thus the power density of the project will be 15 W/m^2. The generated electricity will be delivered to regional power grid, i.e. Central China Power Grid (CCPG).

The purpose of the project is to generate electricity by using Yuanshui River water resources to alleviate electricity shortage in Central China. The project will contribute to the reduction of GHG emission by displacing part of the electricity from the fossil fuel fired power plants of the CCPG.

Findings

In total the assessment team expressed 14 Corrective Action Requests.

The main findings considered formal issues like information in the wrong section of the PDD(CAR 5) or specifying and adding required data (CAR 1,3 ,4, 7, 10, 11, 12). Additional material had to be

delivered to the DOE for clarification (CAR 8, 9).

A recalculation of the emission factors was required, to be in compliance with the calculations of the NDRC (CAR 2).

More alternatives to the project scenario had to be added to the PDD (CAR 6) and the conditions of the Environmental Impact Assessment and the Stakeholders Process have been clarified (CAR 13, 14). Considering these findings the PDD No.4 has been revised and the actual PDD version No.5 is in compliance with the CDM requirements.

Baseline calculation

For the BM calculation the PDD adopts modified methods agreed by the EB for the approved methodologies ACM0002. The emission factor of the thermal power plants is calculated by the proportion of the emissions of coal, gas and oil times the emission factor of the best available coal, gas and oil power plant as defined and published by the Chinese DNA. The new thermal capacity installation that exceeds 20% in the last years, for which data are available, is finally assessed with this factor.

The emission calculations for China were recalculated by TÜV SÜD and a discrepancy to the guidelines of NDRC occurred due to two values where the NDRC did not use the IPCC figures. The proposed project used the same approach resulting in correct but slightly higher emission factors compared to the NDRC values.

Additionality

The additionality has been evidenced by investment analysis. The IRR calculation will be uploaded together with the PDD. The figures of the calculation have been evidenced by the Preliminary Design Report (PDR). The document has been approved by the provincial authorities (see annex 2, ref. 6 and 7). The IRR in the PDD is slightly lower than in the PDR but both IRR are below the benchmark. The benchmark document is a document commonly used for almost all Chinese CDM projects and still valid. There are additional benchmark documents that could be used alternatively but would result in the same figure. The calculation of the IRR has been checked and is correct. The slight difference is caused by a necessary correction of the fixed asset value.

The consideration of CDM before construction has been confirmed by the Decisions of Board Meeting in November 2004 and CDM is specified in Preliminary Design Report.

The common practise analysis has been verified by cross checking the official statistics and web links.

Since all the open questions have been closed the project is in compliance with the CDM requirements.

Following Issues have been raised:

Issue 1

The DOE should confirm the data used for the common practice analysis and clarify the basis for its validation opinion.

AND

Issue 2

The DOE should confirm that the expected additional income from the CDM was essential for the decision to go ahead with the implementation of the project activity given that it was submitted for validation almost two years after the start date of construction.

Referring to Issue 1

Response by Project Participant
Additionality tool step 4 common practice analysis is described in the revised PDD:

The other activities similar to the proposed project activity are hydropower projects in the same region (Hunan Province), rely on a broadly similar technology (hydropower plants), are of a similar scale(50MW~250MW), and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing.

The common practice analysis is limited to the provincial level as the investment environment for each province differs (e.g. with regards to taxes, loan policy and electricity tariffs). The selected geographical area for the project, i.e. Hunan Province, is relatively large. Hunan Province is considerably larger than several countries. The policies and regulations in Chinese provinces are different with each other.

According to *Classification & Design Safety Standard of Hydropower Projects* (DL5180-2003), hydropower plants with capacity between 50 MW~300 MW are classified as medium size projects. The similar scale in PDD is defined as 50 MW~250 MW since there is no similar project existed between 250 MW~300 MW in Hunan Province.

The significant reform to Chinese electric power sector was taken place in 2002. The reform involved establishing State Grid Corporation of China and China Southern Power Grid Corporation[*]. The former State Power Corporation was restructured and separated into 5 national power generation companies[†]. Before the power industry restructure in year 2002, the hydropower plants are mainly developed by state-owned companies, provincial governments ensured that project entity of power plants can obtain sufficient return by providing guarantee electricity tariff[‡]. The national policy changed after 2002, the electricity tariff will be determined on the basis of average costs of power generators using the same advanced technology and built within the same period under the provincial power grid. Thus projects operated after 2002 are considered as similar projects to the proposed project since they were operated under a same policy scheme.

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[*] Notice of the State Council on Printing and Distributing the Plans Regarding the Restructuring of the Power Industry(Guofa [2002] No.5), issued by State Council on 10 February 2002

http://www.china5e.com/laws/index2.htm?id=200608080001

[†] Approval from State Development Planning Commission about Power Generation Asset Restructuring and Division Scheme of State Power Corporation, Guodianban (2002) No.952, 26 December 2002

http://www.365dq.com/Research/Info_View.asp?ContentID=1793

[‡] Ministry of Water Resources and Electric Power, State Economic Committee and State Price Bureau, Note on Implementing methods of Various Power Tariff (Shuidiancaizi[1987] No.101)

http://www.my.gov.cn/MYGOV/1505979644677980 16/20061201/138692.html

There is no hydropower plants with installed capacity between 50 MW~300 MW operated after 2002 is listed in publicly available *Yearbook of China Water Resources 2006* and *Yearbook of China Water Resources 2007*. In order for the completeness of common practice, the *Investigation Report on Hydropower Plants with Installed capacity above 15 MW Operational since 2002 in Hunan Province*, which is compiled by Grade A provincial design institute, Hunan Hydro & Power Design Institute, is used in common practice for the proposed project. There are total 4 similar projects operated after 2002 are listed in the table 8 of PDD.

In order to demonstrate and argue the difference between the proposed project and other 4 similar projects, we would like to list the 4 similar projects again:

Hydropower Station	Installed capacity (MW)	Operation (year)
Jinweizhou	63.18	2003
Zhuzhou Hangdian	140	2006
Hongjiang	225	2003
Wanmipo	240	2004

All the data and information described below are derived from *Investigation Report on Hydropower Plants with Installed Capacity above 15 MW Operational since 2002 in Hunan Province* unless otherwise stated expressly.

Jinweizhou Project obtained the Hunan Provincial Government's favorable support[*] in electricity tariff and tax and a bank loan with low interests from Austrian government[†]. The project owner only needs to repay foreign bank loan and part of domestic bank loan. Furthermore, the annual operation period of Jinweizhou Project amounts 4628 hours, which is much higher than the Tongwan Project (3950 h).

The Zhuzhou Hangdian Project is an inland waterways project financed by government financial support (RMB • 1.15 billion) and World Bank (US$ 0.1 billion of low-interest loan)[‡]. Furthermore, the annual operation period of Zhuzhou Hangdian Project amount s 4740 hours, which is much higher than the Tongwan Project (3950 h).

In general, investors will develop the hydropower plants with good technical and economic indicators, the Hongjiang Hydropower Plant was developed earlier with excellent natural conditions such as high water head and low construction costs. The annual operational time of Hongjiang Hydro-

[*] http://www.shp.com.cn/news/info/2002/7/22/17401657.html

[†] http://www.iwicn.com/view-zp.jsp?id=138

[‡] http://www.zzx.gov.cn/ReadNews.asp?NewsID=560

http://www.chinabidding.com/xmzx.jhtml?method=detail&docId=351178

power Plant is 4311 h*, which is higher than the proposed project (3950 h). The unit kW investment of Hongjiang Project is 7,569 RMB • /kW, which is 25% lower than the proposed project (10,128 RMB • /kW). Furthermore, the unit kWh investment of Hongjiang Project is 1.76 RMB • /kWh), which is 31% lower than the proposed project (2.56 RMB • /kWh).

Wanmipo Hydropower Plant was also developed earlier than the proposed project. The unit kW investment of Wanmipo Project is 6,292 RMB • /kW, which is 38% lower than the proposed project (10,128 RMB • /kW). Furthermore, the unit kWh investment of Wanmipo Project is 1.91 RMB • /kWh), which is 25% lower than the proposed project (2.56 RMB • /kWh).

The reasons for the high investment of the project are as follows:

(1) The project is located at the entrance of canyon. The width of riverbed merely meets the minimum layout requirement of overflow dam. Both the left-bank construction and the right-bank power house are required to be placed on the slope of the river banks. The river banks have to be dug more wider and the hill has to be dug to form a artificial slope with height of 120~150 m according to design to meet construction requirements. It can be found from the PDR that the earth and stone work quantity is as many as 3.4 million m^3. For the construction of the similar scale domestic hydropower projects, the height of artificial slope and earth work quantity for the project is extremely rare.

(2) The project is equipped with 4 sets of 45 MW horizontal bulb type turbines whose unit installed capacity is the biggest in China at the time of starting construction.Thus the transportation and installation of the turbine is very hard and need high investment.

According to above it is concluded that the project is not a common practice in Hunan Province.

Response by TÜV SÜD

Referring to “Issue1”: Chapters 2.2 to 2.5 of the validation report clarify that both a desk review and follow up interviews were performed to validate that all validation requirements, amongst them additionality (containing a common practice analysis) were fulfilled. We have confirmed in chapter 3 of our validation report and protocol and would like to reconfirm that TÜV SÜD reviewed all documents mentioned in the PDD under sub-step 4.a of the additionality tool and confirmed their completeness and relevance for evidencing the analysis of similar projects in the region of the CDM project. The assessment is based on official sources and further verification of these sources is considered being out of the scope of the CDM validation. As the figures used for the Common practice analysis are dating from the time of decision making for the project it can be confirmed that they are applicable in the context of the project activity.

There are three different criteria, which can be used as a filter for common practice analysis. First to name is the Geographical Boundary.

The investment climate and the environment in China differ from province to province. The general requirements of the Chinese government are the same, but local differences (e.g. electricity tariffs; taxes) influence local investment decisions.
The regulations of different provinces have been checked and compared by the DOE. The Hunan province can be considered as a place in a comparable environment. The geographical boundary

* http://www.dianli1000.com/Photo/hcssdz/200705/116.html

can be considered to be applicable.

The second criteria is the Capacity boundary.
The “China Tongwan Hydropower Project” will have a Capacity of 180 MW. According to the “Classification & Design Safety Standard of Hydropower Projects“(DL5180-2003) hydropowerplants with capacity between 50~300 MW are clarified as medium size projects. This report was published by the China Hydropower Engineering Consulting Group Co.(CHECC).
Thit document was checked and verified by the DOE and can be considered valid.

The third criteria is the historical boundary.
In 2002 the Chinese electric power sector was reformed. The former State Grid Corporation was restructed and separated into 5 national power generation companies. Before that provincial governments ensured that project entity of power plants can obtain sufficient return by providing guarantee electricity tariff.
After 2002 the electricity tariff will be determined on the basis of average costs of power generators using the same advanced technology and built within the same period under the provincial power grid. The risk for a hydropower operater is higher than before 2002. For that reason projects implemented after 2002 can be considered as similar.

Searching the “Yearbook of China Water Resources 2006, Yearbook of China Water Resources 2007“and the “Investigation Report on Hydropower Plants with Installed capacity above 15 MW Operational since 2002 in Hunan Province”, which is compiled by Grade A provincial design institute, Hunan Hydro & Power Design Institute, and excluding all projects according to the above mentioned, four similar projects remain.
We mention explicitly that the operational hours and the investment per Unit kWh of the other projects are listed in the respective source and that this source is official. Besides annual operation hour and unit kWh investment, Zhuzhou Hangdian and Jinweizhou projects have got favorable policies in bank loan or electricity tariff.
The request to validate the assumptions and parameters used for the other hydro projects is considered being outside the scope of the CDM validation.

Referring to issue 2

Response by project participant

The reference of serious CDM consideration has been in the PDD and it is concluded that CDM has been seriously taken into account before the start of the construction of the proposed project activity. We would like to take the opportunity to further describe in more details regarding the progress of the project implementation.

The whole timeline regarding the project is as follow:

Time	**Event**
12/07/2004	Learn about of CDM
October 2004	Preliminary Design Report (PDR) completed.
03/11/2004	The project owner decided to implement CDM application in board meeting.
23/02/2005	The project signed the LoI of CDM Project Development.
12/03/2005	PDR approved.
17/03/2005	Industrial & Commercial Bank of China Huaihua Branch agreed to provide bank loan due to CDM.
22/03/2005	Construction permission issued.
16/04/2005	Bank of China Huaihua Branch agreed the bank loan application due to CDM.

09/11/2005	Establishment of Hunan Province CDM Project Service Center (HNCDM).
23/06/2006	Letter of Intent of Emission Reductions Purchase signed.
29/09/2006	Emission Reductions Purchase Agreement signed.
January 2007	GSP PDD completed.
20/03/2007	On-site validation by DOE.
05/11/2007	Chinese LoA received.

As early as in July 2004, the project owner learned about the CDM during an on-site meeting regarding the Tongwan Project organized by the Deputy Governor of People's Government of Zhongfang County.

In the end of October 2004, the Preliminary Design Report (PDR) of Tongwan Hydropower Project was completed, in which the CDM was specified. The water regulation storage of the project is weak and the water head of the project is low, the project is significantly affected by upstream hydropower plant. It can be found from the PDR that the expected power supply (used for IRR calculation) of the project will be decreased if the upstream hydropower plant is put into operation. Due to the high investment of the turbines, generator and earth work engineering and low project IRR in PDR, the project owner decided to implement CDM application to overcome the financial barrier, lower investment risks and apply for bank loan in the board meeting on 3 November 2004 (Ref No.11 in final validation report).

On 23 February 2005, the project owner signed the LoI of CDM Project Development (Ref No.12 in final validation report) for CDM development and application with Hunan Science & Technology Information Research Institute (HNSTI), which is a public service unit belonged to Science & Technology Bureau of Hunan Province. Science & Technology Bureau is one of two CDM administration authority in China, another authority is Development & Reform Commission.

On 17 March 2005, the Industrial & Commercial Bank of China Huaihua agreed to offer loans to the proposed CDM project activity after seriously considering CDM incentives. (Approval Regarding the Bank Loan Application from Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd, Gongyinhuaihan [2005] No. 3, 17 March 2005)

On 22 March 2005, the project owner is permitted to start the construction of the proposed CDM project activity. (Ref No.10 in final validation report).

On 16 April 2005, the Bank of China Huaihua Branch agreed the bank loan application and required the project owner to speed up the CDM implementation process and the CDM revenue should be firstly used for bank loan repayment (Ref No.34 in final validation report).

From the milestones and key events above, it can be concluded that CDM incentives were essential for project owner to go ahead with the implementation of the project activity.

With the development of the CDM project activity, the project owner faced unexpected increasing investment which was not budgeted in PDR after project construction, such as two issues as follows:

(1) Land occupation compensation investment increased: The land compensation budget in Preliminary Design Report was calculated in accordance with original regulation. According to new <Land Compensation and Migration Resettlement Regulation for Large and Medium Scale Water Resources and Hydropower Construction> issued by State Council of the People's Republic of China in August 2006, the compensation standard is higher than the original regulation. The land requisition fee will increase of RMB • 22.84 million (Explanation of Increased Land Occupation Compensation

Investment, Hunan Xiangyi Resettlement Engineering Supervision Company, 20 September 2006). Furthermore, in order to resettle the migrations much better, the project owner will build infrastructure involving water supply, electricity supply and roads etc. These measures will increase migration resettlement budget greatly.

(2) Construction of Anjinag Flood Embankment: In order to prevent flood disasters, the project owner built Anjiang Flood Embankment which was not budgeted in PDR. According to *Engineering Construction Contract of Anjiang Flood Embankment* signed on 14 February 2007, the investment is RMB • 99 million.

The project is still under construction. All the increment of investment during the construction of the project activity makes the project activity much more financially unattractive and CDM is essential for the project owner to the decision to go ahead with the implementation of the project activity.

In the following section, we'll explain why the CDM development is delayed for such a long time.
The CDM development was entrusted to HNSTI, including PDD development, buyer search and so on.

HNSTI has been focused on CDM research since April 2004. Due to lack of English professionals and capable PDD writers as well as huge pressure from project owners and urgent demand of special CDM development team, the Science & Technology Bureau of Hunan Province approved to establish Hunan Province CDM Project Service Center (HNCDM) in July 2005 (Report of CDM Development in Hunan Province, HNSTI, Xiangkexin [2005] No.15, 5 July 2005). Finally, the HNCDM was officially established on 9 November 2005.

Thus the delay of Tongwan CDM development is due to the re-construction of CDM business in HNSTI and buyer search.

The HNSTI completed the draft PDD in June 2005. Due to the strong request from project owner, the experts of HNSTI went to project site for PDD writing in September 2005. In order for filling a complete PDD to present to CERs buyers, the experts of HNCDM went to project site again for PDD writing. The project owner signed the Letter of Intent of Emission Reductions Purchase with Carbon Asset Management Sweden AB on June 23 2006. In order for fully investigate the stakeholder's opinions regarding Tongwan Project, the project owner conducted the stakeholder consultation from 1 September 2006 to 30 September 2006 to collect opinions. Later the project owner signed the Emission Reductions Purchase Agreement with Carbon Asset Management Sweden AB on September 29 2006. Finally, the GSP PDD was completed in January 2007 and submitted to buyer for internal QA/QC. The on-site validation was conducted during 20-21 March 2007 by DOE. The revision history of PDD was described in Section A.1 of PDD.

The time difference between the decision making and the GSP start can be explained through the missing experiences using CDM, the missing clarifications from the Chinese government and the time needed to search for CER buyer. The low efficiency of PDD development, lack of DOE is a common problem in Chinese CDM industry.

Response by TÜV SÜD

We confirm the PP's comments. All the documents have been reviewed by us and they are deemed credible.

The consideration of CDM before the construction of the project is given through the CDM application decision in board meeting, dated on 03/11/2004. The DOE has checked and verified that it is a normal procedure for Hunan Zhongfang Tongwan Hydro & Power Development Co., Ltd to discuss and apply company decisions in board meetings and to prepare and archive minutes of this meetings. For this reason the evidence can be considered authentic. Further action implementing the project was done after this decision. On 25th November 2005 the Chinese government gave further guidance and clarification on the CDM implementation procedures “Measures for Operation and Management of Clean Development Mechanism Projects in China“. This facilitated the interest of CER buyers in CDM projects in China.

From above description, we confirm that the expected additional income from the CDM was essential for the decision to go ahead with the implementation of the project activity although it was submitted for validation almost two years after the start date of construction. The given explanation on this delay is suitable and not unusual for the host country environment.Furthermore, the project is still under construction now.

COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC website by installing a link to TÜV SÜD's own website and invited comments by Parties, stakeholders and non-governmental organisations during a period of 30 days.

The following table presents all key information on this process:

webpage: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=2851&Ebene1_ID=26&Ebene2_ID=787&mode=1	
Starting date of the global stakeholder consultation process: 2007-03-02	
Comment submitted by: none	**Issues raised:** -
Response by TÜV SÜD: -	

4 VALIDATION OPINION

TÜV SÜD has performed a validation of the following proposed CDM project activity:

China Tongwan Hydropower Project.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board.

An analysis as provided by the applied methodology demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions as specified within the final PDD version.

The validation is based on the information made available to us and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 2008-05-28

Certification Body “climate and energy”
TÜV SÜD Industrie Service GmbH

Munich, 2008-05-28

Assessment Team Leader

Industrie Service

ANNEX 1: VALIDATION PROTOCOL

Industrie Service

Table 1 Conformity of Project Activity and PDD

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
A. General description of project activity					
A.1. Title of the project activity					
A.1.1.	Does the used project title clearly enable to identify the unique CDM activity?	1,2	Yes. The project title is China Tongwan Hydropower Project. It includes the location of the project and the category of energy. So it can be clearly identify as an unique CDM activity.	þ	þ
A.1.2.	Are there any indication concerning the revision number and the date of the revision?	1,2	Yes. The version number is 04, and the revision date is Jan. 27 2007. **Corrective Action Request No.1.** Please provide a revision history of the PDD, and indicate the difference between version 01, 02, 03, and version 04 (GPS) of the PDD.	CAR1	þ
A.1.3.	Is this consistent with the time line of the project's history?	1,2	Yes. It's consistent.	þ	þ
A.2. Description of the project activity					
A.2.1.	Is the description delivering a transparent overview of the project activities?	1,2	Yes. The description includes the detailed location of the project (it's located on the Yuanshui River, Zhongfang County, Huaihua City, Hunan Province), the starting date of construction(in March 2005), the total installed capacity (180MW), the annual utilization time (3950 h), the annual net electricity generation (662,000 MWh) and the connected grid (the substation is Yangtang substation, the regional power grid is CCPG). The above data have been proven during the audit on site.	þ	þ
A.2.2.	What proofs are available demonstrating that the project description is in compliance with the actual situation or plan-	1,2,6,7, 8, 9	The planning is described in the preliminary design report. The project activity is the displacement of electricity generated by coal fired power plants with electricity generated by hydro power. The	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	ning?		following materials deliver evidences for the project activity: - The preliminary design report and its approval. - EIA and the approval of EIA - Project approval by the government department - Contract of connection to the grid This data have been proven during the audit.		
A.2.3.	Is the information provided by these proofs consistent with the information provided by the PDD?	1,2	Yes. It is.	þ	þ
A.2.4.	Is all information presented consistent with details provided by further chapters of the PDD?	1,2	Yes. There are no contradictions in the PDD.	þ	þ
A.3. Project participants					
A.3.1.	Is the form required for the indication of project participants correctly applied?	1,2	The form is correctly applied. Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. and Carbon Asset Management AB are the project participants.	þ	þ
A.3.2.	Is the participation of the listed entities or Parties confirmed by each one of them?	1,2	This has to be confirmed in the MoC.	Open issue	þ
A.3.3.	Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1,2	Yes. It is.	þ	þ
A.4. Technical description of the project activity					
A.4.1.	*Location of the project activity*				

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,2	Yes. It's provided a map. It shows the location of the project. The project is located at Tongwan town, Zhongfang county, Huaihua city, Hunan province. And the geographical coordinates of the project are 110°17•19•• E and 27°35•02•• N. They have been verified via Google Earth.	þ	þ
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	1,2, 6, 7, 8, 9	During the audit on site, the license of the company Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. and the approvals of the preliminary design report and EIA report were provided. These documents can demonstrate that the project proponents can implement the project at this site.	þ	þ
A.4.2. Category(ies) of project activity				
A.4.2.1. To which category(ies) does the project activity belonging to? Is the category correctly identified and indicated?	1,2	Yes, the project falls into Type 1-Renewable .Energy Project.	þ	þ
A.4.3. Technology to be employed by the project activity				
A.4.3.1. Does the technical design of the project activity reflect current good practices?	1,2	Yes. The preliminary design report is written by the survey and design institute for water conservancy and water power in Hunan province, dated in March 2005. The institute is the professional hydro power design organization. The approval of initial design report is issued by Hunan province water conservancy department, Xiangshuixu (2005)62, dated on March 12, 2005. This government department is in charge of the approval of hydro power in Hunan province. So the technical design of the project reflects current good practices..	þ	þ
A.4.3.2. Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse gas balance?	1,2,8	As the project is a hydro power project. It belongs to renewable energy project. Without doubt the project can implement the emission reduction of GHG.	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A.4.3.3. Does the implementation of the project activity require any technology transfer from annex-I-countries to the host country(ies)?	1,2	No, it doesn't. There is no technology transfer from annex-I countries to China by the proposed project.	þ	þ
A.4.3.4. Is the technology implemented by the project activity environmentally safe?	1,2	Yes. According to the approval of EIA, issued by Environmental Protection Bureau in Hunan province, Xianghuanping(2005)21, dated on March16 2005, there is no significant environment impact. So the technology implemented by the project activity is environmentally safe.	þ	þ
A.4.3.5. Is the information provided in compliance with actual situation or planning?	1,2	Yes. It is.	þ	þ
A.4.3.6. Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2	The common practice for electricity generation is still coal-fired power plant in the China. Hence, the project definitely would result in a better performance than the common practice.	þ	þ
A.4.3.7. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2	We do not expect that there will be a substitution because equipments have not been installed and expected generation electricity date is Jan. 1st of the year 2008. The life time of the project is under normal circumstances longer than the crediting period.	þ	þ
A.4.3.8. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2	Yes. The operation people should be trained extensively for operation management and maintenance of the hydropower station before the starting operation of the project.	þ	þ
A.4.3.9. Is information available on the demand and requirements for training and maintenance?	1,2	Yes. During the onsite visit the operation management manual and training materials have been provided to the DOE, in which the demand and requirements for training and maintenance are identified and defined.	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A.4.3.10. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2	The planning schedule in the past and for the future was clearly described by the project owner during the audit. The main contracts for the construction of the hydro power have already been signed and equipments have been purchased. There is no risk for delays. **Corrective Action Request No.2.** The time schedule of the implementation of the project should be included into the PDD, including the information of the construction parties.	CAR2	þ
A.4.4. Estimated amount of emission reductions over the chosen crediting period				
A.4.4.1. Is the form required for the indication of projected emission reductions correctly applied?	1,2	Yes. The form is correctly applied.	þ	þ
A.4.4.2. Are the figures provided consistent with other data presented in the PDD?	1,2	Yes. It is consistent.	þ	þ
A.4.5. Public funding of the project activity				
A.4.5.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	1,2	Yes. There is no public funding necessary. All costs are covered by bank loans and private equity.	þ	þ
A.4.5.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1,2	Yes. It is consistent.	þ	þ

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
B. Application of a baseline and monitoring methodology				
B.1. Title and reference of the approved baseline and monitoring methodology				
B.1.1. Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	1,2	Yes. The baseline methodology is ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 06, 19 May 2006) The monitoring methodology is ACM0002-Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources (Version 06, 19 May 2006)	þ	þ
B.1.2. Is the applied version the most recent one and / or is this version still applicable?	1,2	Yes. The most recent version is Version 06.	þ	þ
B.2. Justification of the choice of the methodology and why it is applicable to the project activity				
B.2.1. Is the applied methodology considered the most appropriate one?	1,2	Yes. The baseline and monitoring methodology ACM0002 is the most appropriate one.	þ	þ
B.2.2. Criterion 1: Type of capacity addition by renewable energy	1,2	Applicability checklist / Yes / No Criterion discussed in the PDD? Yes Compliance provable? Yes Evidences provided in the PDD? Yes Compliance verified? Yes	þ	þ
B.2.3. Criterion 2: Exclusion of fuel switching activities	1,2	Applicability checklist / Yes / No Criterion discussed in the PDD? Yes Compliance provable? Yes	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Evidences provided in the PDD? Yes Compliance verified? Yes		
B.2.4. Criterion 3: Defined electricity grid boundaries	1,2	Applicability checklist / Yes / No Criterion discussed in the PDD? Yes Compliance provable? Yes Evidences provided in the PDD? Yes Compliance verified? Yes	þ	þ
B.2.5. Criterion 4: Approved inclusion in other methodologies (if applied only)	1,2	Not applicable	þ	þ
B.3. Description of the sources and gases included in the project boundary				
B.3.1. Source: Fugitive Emissions from non-condensable gases (geothermal activities only) Gas(es): CO_2, CH_4 Type: Project Emissions		Boundary checklist / Yes / No Source and gas(es) discussed by the PDD? N/A Inclusion / exclusion justified? N/A Explanation / Justification sufficient? N/A Consistency with monitoring plan? N/A	þ	þ
B.3.2. Source: Emissions from combustion of fossil fuels (geothermal activities only) Gas(es): CO_2 Type: Project Emissions		Boundary checklist / Yes / No Source and gas(es) discussed by the PDD? N/A Inclusion / exclusion justified? N/A Explanation / Justification sufficient? N/A	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Consistency with monitoring plan? N/A		
B.3.3. Source: Emissions from the reservoir (new hydroelectric activities only) Gas(es): CO_2, CH_4 Type: Project Emissions		Boundary checklist: Source and gas(es) discussed by the PDD? Yes; Inclusion / exclusion justified? Yes; Explanation / Justification sufficient? Yes; Consistency with monitoring plan? Yes	þ	þ
B.3.4. Source: Emissions from electricity generation in fossil fuel fired power plants of the project electricity system Gas(es): CO_2 Type: Baseline Emissions		Boundary checklist: Source and gas(es) discussed by the PDD? N/A; Inclusion / exclusion justified? N/A; Explanation / Justification sufficient? N/A; Consistency with monitoring plan? N/A	þ	þ
B.3.5. Source: Emissions from electricity generation in fossil fuel fired power plants of any connected electricity system Gas(es): CO_2 Type: Baseline Emissions		Boundary checklist: Source and gas(es) discussed by the PDD? Yes; Inclusion / exclusion justified? Yes; Explanation / Justification sufficient? Yes; Consistency with monitoring plan? Yes	þ	þ
B.3.6. Source: Emissions from electricity generation in fossil fuel fired power plants of imported electricity Gas(es): CO_2	1,2	Boundary checklist: Source and gas(es) discussed by the PDD? No; Inclusion / exclusion justified? No; Explanation / Justification sufficient? No	CAR3	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	Type: Baseline Emissions		Consistency with monitoring plan? No **Corrective Action Request No.3.** The emission from power plants of imported electricity has to be included in the project boundary. If there are no imports to the Central China Grid please mention in annex 3.		
B.3.7.	Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	1,2	Yes. The project boundary for the proposed project is represented by the Central China Power Grid.	þ	þ
B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario					
B.4.1.	Is it clearly described that the baseline is represented by the combined margin of the grid the activity will be connected to?	1,2	Yes. The project is connected to CCPG, the geographic extent of the grid boundary includes Jiangxi Province, Henan Province, Hubei Province, Hunan Province, Sichuan Province and Chongqing Municipality. **Corrective Action Request No.4.** The alternative scenario should not be described in this section as the methodology allows only one baseline: grid connected electricity. Please copy the scenario consideration to section B.5.	CAR4	þ
B.4.2.	In case of any modification or retrofit of existing facilities: Is data available to determine the historic production level?	1,2	Not applicable	þ	þ
B.4.3.	In case of any modification or retrofit of existing facilities: Have conservative assumptions been applied in order to estimate the point in time when the existing equipment needs to be replaced?	1,2	Not applicable	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final 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):					
B.5.1.	Have realistic and credible alternatives been identified providing comparable outputs or services? (step 1a)	1,2,3	The realistic and credible alternative is identified. And it is alternative 3), i.e. Provision of equivalent amount of annual power output by the grid where the proposed project is connected with. The following alternatives of baseline scenario have been discussed in section B.4 • Construction of a fossil fuel-fired power plant with equivalent amount of installed capacity or annual electricity output; • The proposed project activity not undertaken as a CDM project activity; • Provision of equivalent amount of annual power output by the grid where the proposed project is connected with. **Corrective Action Request No.5.** The discussion of alternative: Construction of a power plant using other sources of renewable energy with equivalent amount of installed capacity is missing. But obviously version 2 of the additionality has been applied. Please change to version 3 and skip step 0 and 5. And see B.4.1.	CAR5	þ
B.5.2.	Is the project activity without CDM included in these alternatives? (step 1a)	1,2,3	Yes. It is. But see B.4.1.	þ	þ
B.5.3.	Is a discussion provided for all identified alternatives concerning the compliance with applicable laws and regulations? (step 1b)	1,2,3	Yes. A discussion is provided.	þ	þ
B.5.4.	In case the PDD argues that specific laws are not enforced in the country or region:	1,2,3	Not applicable.	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	Is evidence available concerning that statement? (step 1b)				
B.5.5.	In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	1,2,3	Yes. The benchmark analysis is applied.	þ	þ
B.5.6.	In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	1,2,3	NA	þ	þ
B.5.7.	In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2,3	NA	þ	þ
B.5.8.	In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2,3	Yes. The most suitable financial indicator IRR is clearly identified. According to "*Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project*" from State Electric Power Corporation in 2003, the financial benchmark rate of return (after tax) for Chinese hydropower projects is to be 8% of the total investment IRR. The evidence has been delivered to the DOE. It is the standard benchmark used in most of the Chinese CDM projects.	þ	þ
B.5.9.	In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	1,2,3	The calculation of financial figures for IRR is done for the project activity without the revenues from the sale of CERs. And it is 6.24%. **Corrective Action Request No.6.** The IRR with the revenues from the sale of CERs is missing. Please provide the figure.	CAR6	þ
B.5.10.	In case of Option II or Option III: Is the analysis presented in a transparent man-	1,2,3	**Corrective Action Request No.7.** The calculation table of IRR in the form of Excel should be deli-	CAR7	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	ner including publicly available proofs for the utilized data?		vered to the DOE.		
B.5.11.	In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?		NA	þ	þ
B.5.12.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?		NA	þ	þ
B.5.13.	In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?		NA	þ	þ
B.5.14.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	1,2,3	Yes. In table 5 there are 7 hydro power plants with installed capacity above 20MW completed after year 2002 in Hunan is shown. And their IRR were compared with the proposed project. **Corrective Action Request No.8.** Please deliver the evidences for table 5 and describe the differences between the proposed project and the existing projects that lead to the higher costs / lower IRR. Why there was no subsidy for the Tonwan project and how can it be excluded that there will be subsidies later on?	CAR8	þ
B.5.15.	If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	1,2,3	Through comparing the IRR of the similar projects it is demonstrated that the proposal project would not be implemented without the CDM component in spite of these similarities.	þ	þ
B.5.16.	Is it appropriately explained how the ap-	1,2,3	Yes. the CERs revenue will improve the project IRR and can	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
	proval of the project activity will help to overcome the economic and financial hurdles or other identified barriers?		make the project financially attractive. The investment risks for uncertainties and the electricity generation variations of the project will be decreased.		
B.6. Emissions reductions					
B.6.1. Explanation of methodological choices					
B.6.1.1.	Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1,2	The calculation of the emission reduction is applied according to the steps described in ACM0002: - Calculation of the Operating Margin Emission Factor - Calculation of the Build Margin Emission Factor - Calculation of the Combined Margin Emission Factor These steps are described in a transparent manner.	þ	þ
B.6.1.2.	Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	1,2	Yes. it is.	þ	þ
B.6.1.3.	Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2	Yes, leakages have been considered and calculated according to the emission reduced by the 3 existing power plants. **Clarification Request 1:** Please deliver the evidence for the maximum power generation of the 3 small power plants.	CR1	þ
B.6.1.4.	Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2	Yes They are correctly presented.	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
B.6.1.5. Is the choice of options to determine the emissions factor (OM, BM) justified in a suitable and transparent manner?	1,2	**Corrective Action Request No.9.** Please specify the choice of ex-ante or ex-post calculation of the grid factor.	CAR9	þ
B.6.1.6. In case of alternative weighing factors for the Combined Margin: Is the quantification of the alternative weighing factor justified in a suitable and transparent manner?	1,2	Not applicable. The default weights for hydro power projects in the 6th version of ACM0002 (OM 0.5 and BM 0.5 respectively) are used.	þ	þ
B.6.1.7. In case of alternative weighing factors for the Combined Margin: Is the guidance for the PDD concerning the acceptability of alternative weights considered in the discussion?	1,2	See B.6.1.6.	þ	þ
B.6.1.8. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2	No leakage is considered according to the methodology.	þ	þ
B.6.1.9. Are formulae required for the determination of emission reductions correctly presented?	1,2	Yes. They are correctly presented.	þ	þ
B.6.2. Data and parameters that are available at validation				
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?	1,2	Yes. A list of parameters is clearly presented according to ACM0002. **Corrective Action Request No.10.** The parameters mentioned in official published data, such as the captive power rate, unit energy consumption for advanced power technologies, imported power etc. ,	CAR10	þ
B.6.2.2. Is the choice of ex-ante or ex-post vintage	1,2	Yes, the ex-ante calculation of emission factors is chosen.	þ	þ

<table>
<tr><th colspan="2">CHECKLIST TOPIC / QUESTION</th><th>Ref.</th><th>COMMENTS</th><th>PDD in GSP</th><th>Final PDD</th></tr>
<tr><td colspan="2">of OM and BM factors clearly specified in the PDD?</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.6.2.3.</td><td>Parameter Title:
Annual electricity supplied to the grid prior to retrofit
(applicable only for retrofit and modification activities)</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N/A</td></tr><tr><td>Data unit correctly expressed?</td><td>N/A</td></tr><tr><td>Appropriate description of parameter?</td><td>N/A</td></tr><tr><td>Source clearly referenced?</td><td>N/A</td></tr><tr><td>Correct value provided?</td><td>N/A</td></tr><tr><td>Has this value been verified?</td><td>N/A</td></tr><tr><td>Choice of data correctly justified?</td><td>N/A</td></tr><tr><td>Measurement method correctly described?</td><td>N/A</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.2.4.</td><td>Parameter Title:
Emission factor of the grid (CM)</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>
See B.6.3. of the PDD</td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.2.5.</td><td>Parameter Title:
Operating margin (OM) emission factor of the grid</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
</table>

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes See B.6.3. of the PDD		
B.6.2.6. Parameter Title: Build margin (BM) emission factor of the grid	1	Data Checklist / Yes / No Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes See B.6.3. of the PDD	þ	þ
B.6.2.7. Parameter Title: fuel consumption of each power source	1	Data Checklist / Yes / No Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes	þ	þ

<table>
<tr><th>CHECKLIST TOPIC / QUESTION</th><th>Ref.</th><th>COMMENTS</th><th>PDD in GSP</th><th>Final PDD</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.6.2.8. Parameter Title:
emission coefficient of each fuel</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.2.9. Parameter Title:
electricity generation of each power source</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.2.10. Parameter Title:
surface area of full reservoir level
(for new hydroelectric activities only)</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
</table>

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes		
B.6.2.11. Parameter Title: fraction of time with low costs /must run plant at the margin (for simple adjusted OM only)	1	Data Checklist / Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided? N/A Has this value been verified? N/A Choice of data correctly justified? N/A Measurement method correctly described? N/A	þ	þ
B.6.2.12. Parameter Title: electricity imports	1	Data Checklist / Yes / No Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	See B.3.6.	þ

<table>
<tr><th>CHECKLIST TOPIC / QUESTION</th><th>Ref.</th><th>COMMENTS</th><th>PDD in GSP</th><th>Final PDD</th></tr>
<tr><td></td><td></td><td>See B.3.6.</td><td></td><td></td></tr>
<tr><td>B.6.2.13. Parameter Title:
CO_2 emission coefficient of fuels used in connected grids</td><td>1</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td colspan="5">B.6.3. Ex-ante calculation of emission reductions</td></tr>
<tr><td>B.6.3.1. Is the projection based on the same procedures as used for future monitoring?</td><td>1,2</td><td>Yes. It is.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?</td><td>1,2</td><td>Yes. the GHG calculation is documented in a complete and transparent manner.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.3.3. Is the data provided in this section consistent with data as presented in other chapters of the PDD?</td><td>1,2</td><td>Yes. it is.</td><td>þ</td><td>þ</td></tr>
<tr><td colspan="5">B.6.4. Summary of the ex-ante estimation of emission reductions</td></tr>
<tr><td>B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?</td><td>1,2</td><td>Yes. it will.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?</td><td>1,2</td><td>Yes, the form is correctly applied according to the PDD template.</td><td>þ</td><td>þ</td></tr>
</table>

<table>
<tr><th colspan="2">CHECKLIST TOPIC / QUESTION</th><th>Ref.</th><th>COMMENTS</th><th>PDD in GSP</th><th>Final PDD</th></tr>
<tr><td>B.6.4.3.</td><td>Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?</td><td>1,2</td><td>Yes. The estimated start date is Jan.1st 2008. it seems reasonable according to the implementation schedule.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.6.4.4.</td><td>Is the data provided in this section in consistency with data as presented in other chapters of the PDD?</td><td>1,2</td><td>Yes. it is.</td><td>þ</td><td>þ</td></tr>
<tr><td colspan="6">B.7. Application of the monitoring methodology and description of the monitoring plan</td></tr>
<tr><td colspan="6">B.7.1. Data and parameters monitored</td></tr>
<tr><td>B.7.1.1.</td><td>Is the list of parameters presented by chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?</td><td>1,2</td><td>Yes. EG_y is the parameter needed to be monitored. It will be measured onsite and checked with electricity sales receipts provided by Huaihua Electric Power Group.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.7.1.2.</td><td>Parameter Title:
Electricity supplied to the grid</td><td>1,2</td><td><table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table><u>Corrective Action Request No.11.</u></td><td>CAR11</td><td>þ</td></tr>
</table>

<table>
<tr><th>CHECKLIST TOPIC / QUESTION</th><th>Ref.</th><th>COMMENTS</th><th>PDD in GSP</th><th>Final PDD</th></tr>
<tr><td></td><td></td><td>Please indicate if the reference to DL/T4448-2000 is necessary. What is the accuracy according to DL/T5137-2001? Please explicitly explain that net electricity is used for the calculation of emission reductions and how it will be calculated (formula). Please deliver a appropriate figure/scheme of the metering equipment in the PDD (annex 4).</td><td></td><td></td></tr>
<tr><td>B.7.1.3. Parameter Title:
Quantity of steam produced
(for geothermal projects only)</td><td>1,2</td><td><table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N/A</td></tr><tr><td>Data unit correctly expressed?</td><td>N/A</td></tr><tr><td>Appropriate description of parameter?</td><td>N/A</td></tr><tr><td>Source clearly referenced?</td><td>N/A</td></tr><tr><td>Correct value provided for estimation?</td><td>N/A</td></tr><tr><td>Has this value been verified?</td><td>N/A</td></tr><tr><td>Measurement method correctly described?</td><td>N/A</td></tr><tr><td>Correct reference to standards?</td><td>N/A</td></tr><tr><td>Indication of accuracy provided?</td><td>N/A</td></tr><tr><td>QA/QC procedures described?</td><td>N/A</td></tr><tr><td>QA/QC procedures appropriate?</td><td>N/A</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.7.1.4. Parameter Title:
Fraction of CO_2 in steam produced
(for geothermal projects only)</td><td>1,2</td><td><table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N/A</td></tr><tr><td>Data unit correctly expressed?</td><td>N/A</td></tr><tr><td>Appropriate description of parameter?</td><td>N/A</td></tr><tr><td>Source clearly referenced?</td><td>N/A</td></tr><tr><td>Correct value provided for estimation?</td><td>N/A</td></tr><tr><td>Has this value been verified?</td><td>N/A</td></tr><tr><td>Measurement method correctly described?</td><td>N/A</td></tr></table></td><td>þ</td><td>þ</td></tr>
</table>

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A		
B.7.1.5. Parameter Title: Fraction of CH_4 in steam produced (for geothermal projects only)	1,2	Monitoring Checklist / Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided for estimation? N/A Has this value been verified? N/A Measurement method correctly described? N/A Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A	þ	þ
B.7.1.6. Parameter Title: Quantity of steam generated during well testing (for geothermal projects only)	1,2	Monitoring Checklist / Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided for estimation? N/A Has this value been verified? N/A Measurement method correctly described? N/A	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A		
B.7.1.7. Parameter Title: Fraction of CO_2 in steam during well testing (for geothermal projects only)	1,2	Monitoring Checklist — Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided for estimation? N/A Has this value been verified? N/A Measurement method correctly described? N/A Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A	þ	þ
B.7.1.8. Parameter Title: Fraction of CH_4 in steam during well testing (for geothermal projects only)	1,2	Monitoring Checklist — Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided for estimation? N/A Has this value been verified? N/A Measurement method correctly described? N/A	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A		
B.7.1.9. Parameter Title: CO_2 emission coefficient of fuel used by the geothermal plant (for geothermal projects only)	1,2	Monitoring Checklist / Yes / No Title in line with methodology? N/A Data unit correctly expressed? N/A Appropriate description of parameter? N/A Source clearly referenced? N/A Correct value provided for estimation? N/A Has this value been verified? N/A Measurement method correctly described? N/A Correct reference to standards? N/A Indication of accuracy provided? N/A QA/QC procedures described? N/A QA/QC procedures appropriate? N/A	þ	þ
B.7.2. Description of the monitoring plan				
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisoned situation?	1,2	The project owner provided the monitoring and management handbook of Tongwan hydropower plant to the DOE. The operational and management structure clearly described and in compliance with the envisioned situation.	þ	þ
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	1,2	Yes. According to the PDD the monitoring data will be measured hourly and automatically by equipment. Monitoring report will be recorded daily and will be internally checked by general engineer	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
		and finally verified by general manager. All the monitoring data, calibration and adjustment reports will be stored in electronic and paper format. at least two years beyond crediting period		
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	1,2	Yes.	þ	þ
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisoned monitoring provisions?	1,2	Yes. Annex4 provides more information about the monitoring and management handbook of Tongwan hydropower plant.	þ	þ
B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)				
B.8.1. Is there any indication of a date when the baseline was determined?	1,2	Yes. it was determined on Jan.27 2007.	þ	þ
B.8.2. Is this consistent with the time line of the PDD history?	1,2	Yes. It is consistent.	þ	þ
B.8.3. Is the information on the person(s) / entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1,2	Yes. Mr. Zheng Yaguo, Xu Hengzhi, Zhang Haiwen of Hunan CDM project service centre determined the monitoring methodology.	þ	þ
B.8.4. Is information provided whether this person / entity is also considered a project participant?	1,2	No. the above mentioned persons are not considered as project participant.	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
C. Duration of the project activity / crediting period					
C.1. Duration of the project activity					
C.1.1.	Are the project's starting date and operational lifetime clearly defined and reasonable?	1,2	Yes. The starting date of the project is on March 22nd 2005, and the operational lifetime is expected as 30 years.	þ	þ
C.2. Choice of the crediting period and related information					
C.2.1.	Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	1,2	7 years with potential for 2 renewals is chosen as the crediting period.	þ	þ
D. Environmental impacts					
D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts					
D.1.1.	Has the analysis of the environmental impacts of the project activity been sufficiently described?	1,2	Yes. The environmental impacts are summarized in the construction period and the operation period.	þ	þ
D.1.2.	Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	1,2,8	Yes, EIA is a must in P. R. China for new hydro power projects. The approval of EIA Report for CDM project "China Tongwan Hydropower Project", issued by Environmental Protection Bureau in Hunan province, Xianghuanping (2005)21, dated on March 16, 2005.	þ	þ
D.1.3.	Will the project create any adverse environmental effects?	1,2,8	Referred to the EIA and the approval of EIA, the project will create no negative environmental impacts.	CAR12	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
			Corrective Action Request No.12. Please provide more information about the resettlement and compensation in the PDD. E.g. the amount of people affected by the project, the flooded land area and the impact on the IRR etc.		
D.1.4.	Were transboundary environmental impacts identified in the analysis?	1,2,8	There is no trans-boundary impact described in EIA report or approval of EIA.	þ	þ
D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party					
D.2.1.	Have the identified environmental impacts been addressed in the project design sufficiently?	1,2,8	Refering to the EIA and the approval of EIA, there is no adverse environmental impact from the project activity.	þ	þ
D.2.2.	Does the project comply with environmental legislation in the host country?	1,2,8	Yes, the project is in conformity with the environmental legislation of P. R. China and the EIA has been approved by authorized organization.	þ	þ
E. Stakeholders' comments					
E.1. Brief description how comments by local stakeholders have been invited and compiled					
E.1.1.	Have relevant stakeholders been consulted?	1,2	Yes. A stakeholders' symposium was held and a survey to stakeholders in form of questionnaire was carried out. **Corrective Action Request No.13.** Please indicate the date of symposium and survey in the PDD. Why there are only 450 questionnaires if up to 5 000 people are affected by resettlement?	CAR13	þ
E.1.2.	Have appropriate media been used to invite comments by local stakeholders?	1,2	Yes. a symposium and questionnaire have been used.	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
E.1.3.	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1,2	The stakeholder consultation has been carried out according to the EIA regulation.	þ	þ
E.1.4.	Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,2	Yes. The process is described in a complete and transparent manner.	þ	þ
E.2. Summary of the comments received					
E.2.1.	Is a summary of the stakeholder comments received provided?	1,2	Yes, the PDD gives a summary of stakeholder comments,	þ	þ
E.3. Report on how due account was taken of any comments received					
E.3.1.	Has due account been taken of any stakeholder comments received?	1,2	Yes. After the project owner compiling the investigation results, they made quick response in views of question reflected by the investigation.	þ	þ
F. Annexes 1 - 4					
Annex 1: Contact Information					
F.1.1.	Is the information provided consistent with the one given under section A.3?	1,2	Yes. it is consistent.	þ	þ
F.1.2.	Is the information on all private participants and directly involved Parties presented?	1,2	The information about Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. and Carbon Asset Management AB is presented.	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
Annex 2: Information regarding public funding					
F.1.3.	Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,2	Yes. There is no public funding necessary; all costs are covered by bank loans and private equity.	þ	þ
F.1.4.	If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1,2	See F.1.3	þ	þ
Annex 3: Baseline information					
F.1.5.	If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1,2	Yes. it is consistent.	þ	þ
F.1.6.	Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	Yes. During the audit on site the data provided has been verified.	þ	þ
F.1.7.	Does the additional information substantiate / support statements given in other sections of the PDD?	1,2	Yes. it does.	þ	þ
Annex 5: Monitoring information					
F.1.8.	If additional background information on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?	1,2	Yes. The relevant information of the Monitoring and Management Handbook of Tongwan Hydropower Plant is provided. It is consistent with data presented in other sections of the PDD	þ	þ

CHECKLIST TOPIC / QUESTION		Ref.	COMMENTS	PDD in GSP	Final PDD
F.1.9.	Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	Yes. During on site the information provided has been verified by the validation team.	þ	þ
F.1.10.	Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1,2	Yes. It does.	þ	þ

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Yes. The version number is 04, and the revision date is Jan. 27 2007. **Corrective Action Request No.1.** Please provide a revision history of the PDD, and indicate the difference between version 01, 02, 03, and version 04 (GPS) of the PDD.	A.1.2.	The revision history of the PDD is specified in Section A.1 of the revised PDD.	þ

Corrective Action Request No.2. Please explain why the emission factors are slightly higher than the factor recently published by NDRC, the Chinese DNA.	A.2.1	For Central China Power Grid, the difference with our calculation and NDRC is the emission factor of Coke and Refinery Gas. The NDRC for the two kinds of fuel is 25.8 tC/TJ and 18.2 tC/TJ. However, it is not the data from IPCC2006 and NDRC quoted all the emission factors of fuels from IPCC2006. So, I correct the two kinds of fuels into 29.2 tC/TJ and 15.7 tC/TJ in line with IPCC2006 data. Furthermore, there is 15 thousand tons “other coking products” used in Hunan Province for power generation in year 2005. The NDRC listed the emission factor and NCV for the fuel “other coking product” in their calculation. However, we have checked IPCC2006 and China Energy Statistical Yearbook, there are no emission factor and NCV data for the “other coking product”. In order to abide by accuracy, we do not calculate the CO2 emissions for “other coking product”, and this approach is conservative. For other data, they are all the same with NDRC’s. It is just coincidence that the corrected EF calculation is higher than that of NDRC. As a matter of fact, the EF calculation for other national grid, like Northwest China Power Grid or Northern China Power Grid, is lower than that of NDRC results.	þ TÜV SÜD has made its own calculations based on the available statistical data and confirms that TÜV SÜD has got the same result.

The planning schedule in the past and for the future was clearly described by the project owner during the audit. The main contracts for the construction of the hydro power have already been signed and equipments have been purchased. There is no risk for delays. **Corrective Action Request No.3.** The time schedule of the implementation of the project should be included into the PDD, including the information of the construction parties.	A.4.3.10	The time schedule of the implementation of the project and information of the construction parties is included in Section A.4.3 of the revised PDD.	þ
Corrective Action Request No.4. The emission from power plants of imported electricity has to be included in the project boundary. If there are no imports to the Central China Grid please mention in annex 3.	B.3.6.	There is no electricity imported from other power grids to Central China Power Grid. It is mentioned in Section B.3, Section B.6 and Annex 3 of the revised PDD.	þ
Yes. The project is connected to CCPG, the geographic extent of the grid boundary includes Jiangxi Province, Henan Province, Hubei Province, Hunan Province, Sichuan Province and Chongqing Municipality. **Corrective Action Request No.5.** The alternative scenario should not be described in this section as the methodology allows only one baseline: grid connected electricity. Please copy the scenario consideration to section B.5.	B.4.1	The baseline scenario identification is described in Section B.5 of the revised PDD.	þ

The realistic and credible alternative is identified. And it is alternative 3), i.e. Provision of equivalent amount of annual power output by the grid where the proposed project is connected with. The following alternatives of baseline scenario have been discussed in section B.4 • Construction of a fossil fuel-fired power plant with equivalent amount of installed capacity or annual electricity output; • The proposed project activity not undertaken as a CDM project activity; • Provision of equivalent amount of annual power output by the grid where the proposed project is connected with. **Corrective Action Request No.6.** The discussion of alternative: Construction of a power plant using other sources of renewable energy with equivalent amount of installed capacity is missing. But obviously version 2 of the additionality has been applied. Please change to version 3 and skip step 0 and 5. And see B.4.1.	B.5.1.	The baseline scenario identification is corrected in Section B.5 of the revised PDD. The Additionality Tool Version 3 is used in the Section B.5 of the revised PDD.	þ

The calculation of financial figures for IRR is done for the project activity without the revenues from the sale of CERs. And it is 6.24%. **Corrective Action Request No.7.** The IRR with the revenues from the sale of CERs is missing. Please provide the figure.	B.5.9	There is no requirement to validate the inclusion of the CER revenues in the IRR analysis neither in the Modalities and Procedures for a Clean Development Mechanism (MOP) nor in the additionality tool or further guidance by the EB. In other words, the validation criteria only request to assess that the project would not have happened in the absence of the CDM and this can be proven-amongst other methods-by showing that the project activity is not the baseline scenario that provides the highest financial return.	þ The IRR with CER is provided in the IRR Excel sheet and is higher than the benchmark.
Corrective Action Request No.8. The calculation table of IRR in the form of Excel should be delivered to the DOE.	B.5.10	The IRR calculation excel file is submitted together with the revised PDD.	þ
Yes. In table 5 there are 7 hydro power plants with installed capacity above 20MW completed after year 2002 in Hunan is shown. And their IRR were compared with the proposed project. **Corrective Action Request No.9.** Please deliver the evidences for table 5 and describe the differences between the proposed project and the existing projects that lead to the higher costs / lower IRR. Why there was no subsidy for the Tonwan project and how can it be excluded that there will be subsidies later on?	B.5.14	There are two other projects that receive subsidies and it is indeed government-run company, like in the case of Tongwan project. However, it received this subsidy mainly because the main function of the projects are shipping other than power generation. Construction of these two projects are primarily for social benefits other than economic incomes/benefits. The main function of Tongwan is power generation. The project owner did not receive subsidy from government or international fund and will not in the future.	þ

Yes, leakages have been considered and calculated according to the emission reduced by the 3 existing power plants. **Clarification Request 1:** Please deliver the evidence for the maximum power generation of the 3 small power plants.	B.6.1.3.	The evidence of the annual average power generation of the 3 small power plants is submitted together with the revised PDD. The total installed capacity of 3 small hydropower plants is 1.35 MW. The average annual total power generation of the 3 small hydropower plants is 7000 MWh. In order to comply with conservative manner, the 3 small hydropower plants are assumed to operate full year. Thus, the annual power generation of 11826 MWh (1.35 MW*8760 h=11826 MWh) is deducted from power supply by Tognwan (66200-11826=650174 MWh) and the method will always be used to calculate the baseline emission during the whole 3 renewable crediting periods.	þ
Corrective Action Request No.10. Please specify the choice of ex-ante or ex-post calculation of the grid factor.	B.6.1.5.	The ex-ante approach is chosen for grid factor calculation, it is corrected in Section B.6.1 of the revised PDD.	þ
Yes. A list of parameters is clearly presented according to ACM0002. **Corrective Action Request No.11.** The parameters mentioned in official published data, such as the captive power rate, unit energy consumption for advanced power technologies, imported power etc. ,	B.6.2.1.	The missed parameters are included in Section B.6.2 of the revised PDD.	þ

Corrective Action Request No.12. Please indicate if the reference to DL/T4448-2000 is necessary. What is the accuracy according to DL/T5137-2001? Please explicitly explain that net electricity is used for the calculation of emission reductions and how it will be calculated (formula). Please deliver a appropriate figure/scheme of the metering equipment in the PDD (annex 4).	B.7.1.2.	The monitoring information is revised in Section B.7 of the revised PDD. The accuracy requests for Master Meter is 0.5s in accordance with DL/T5173-2001; the accuracy requests for Master Meter is 0.2s or 0.5s in accordance with DL/T448-2000. The DL/T448-2000 is enough to be used as reference in the revised PDD. The DL/T5137-2001 is not used as reference in the revised PDD. The scheme of metering equipment is included in Section B.7.2 of revised PDD.	þ
Referred to the EIA and the approval of EIA, the project will create no negative environmental impacts. **Corrective Action Request No.13.** Please provide more information about the resettlement and compensation in the PDD. E.g. the amount of people affected by the project, the flooded land area and the impact on the IRR etc.	D.1.3.	The amount of resettlers and flooded land area is specified in Section D.1 of the revised PDD. The impact of compensation payments on the IRR has been considered in the Preliminary Design Report and the PDD of Tongwan Hydropower Plant.	þ

Yes. A stakeholders' symposium was held and a survey to stakeholders in form of questionnaire was carried out. **Corrective Action Request No.14.** Please indicate the date of symposium and survey in the PDD. Why there are only 450 questionnaires if up to 5 000 people are affected by resettlement?	E.1.1.	Because of the construction of the Anjiang Flood Embankment, there are 3861 resettlers (563 households). The project owner invited these resettlers to fill in a questionnaire during 1 September to 30 September of 2006. The resettlers were invited both by personal visits from local government officials as well as by 55 bulletins that were posted around the project site, Zhongfang County and Hongjiang City. The questionnaires were easily accessible by the resettlers, either through the local government or the project owner. 425 filled in questionnaires were received and the project owner then held a symposium on 20 October 2006 to discuss the answers with government officials and resettler representatives.	þ

Industrie Service

ANNEX 2: INFORMATION REFERENCE LIST

Reference No.	Document or Type of Information
1.	Project Design Document for CDM project “China Tongwan Hydropower Project”, version 04
2.	Consolidated baseline methodology for grid-connected electricity generation from renewable sources, ACM0002, version 06
3.	Tool for the demonstration and assessment of additionality, version 02
4.	Participant list of on-site interview, signed on March 21, 2007
5.	March 20, 2007: On-site interviews at the office of Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. March 21, 2007: On-site interviews at the site of the hydropower plant in Yuanshui river and at the nearby village Validation team: Carl Zhou CDM Auditor, TUV SÜD Industries Service GmbH Interviewed persons: Ms. Song Zhengrong Zhongfang county government the vice-leader of the county Mr. Zhou Hua Zhongfang county government the leader of the department Mr. Qu Jie Zhongfang county government the vice-researcher Mr. Shi Xuanling Hongjiang city government the leader of the house management bureau Mr. Liu Anchang Zhongfang county government the leader of the development and reform bureau Mr. Xiang Pusu Zhongfang county government the leader of the environmental protection bureau Mr. Yang Wenchang Zhongfang county government the vice-leader of the immigrant and resettlement bureau Mr. Ling Haiquan Hunan province water power design institute engineer Mr. Bu Jikan Hunan province water power design institute engineer Mr. Wu Yuehong Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. general manager Mr. Shu Keyou Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. vice-leader of the resettlement office Mr. Zhan Xiaolong Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. vice-leader of the resettlement office Mr. Bai Xiaohong Xiangyi resettlement supervision company

Reference No.	Document or Type of Information
	Mr. Yu Qingdong — Xiangyi resettlement supervision company Mr. Li Leyong — Hunan province CDM centre — project leader Mr. Xie Lei — Carbon Asset Management Co. Ltd — project leader Miss Xuman — Carbon Asset Management Co. Ltd — Assistant Miss Yang Mingming — Carbon Asset Management Co. Ltd — Business Manager Mr. Xu Hengzhi — Hunan province CDM centre — project leader Mr. Zhang Haiwen — Hunan province CDM centre — general manager Miss Z ou Zhifang — Hunan province CDM centre — project leader Mr. Zhou Ruhong — Tongwan town Xinghua village — immigrant representative Mr. Tian Xiaohua — Tongwan town government — leader of the town Mr. Zhou Qiqian — Tongwan town government — leader of the department Mr. Xiao Xiaoming — Tongwan town Xinghua village — immigrant representative Mr. Zhou Zilian — Tongwan town Dayantou village — immigrant representative Mr. Zhang Changfu — Tongwan town Xinghua village — immigrant representative Mr. Zhou Nanfang — Tongwan town Dujiangpo village — immigrant representative
6.	Preliminary design report for CDM project “China Tongwan Hydropower Project”, No. HND/D080c-1-01, written by the survey and design institute for water conservancy and water power in Hunan province, dated in March 2005.
7.	Approval of Preliminary design report for CDM project “China Tongwan Hydropower Project”, issued by Hunan province water conservancy department, Xiangshuixu(2005)62, dated on March 12th, 2005.
8.	EIA Report for CDM project “China Tongwan Hydropower Project”, written by Hunan province environmental protection science institute, dated in Feb. 2005
9.	Approval of EIA Report for CDM project “China Tongwan Hydropower Project”, issued by Environmental Protection Bureau in Hunan province, Xianghuanping(2005)21, dated on March 16, 2005.
10.	Application report for starting to construction the project “China Tongwan Hydropower Project”, issued by Hunan province water conservancy department, dated on March 22, 2005.
11.	Decision for implementing CDM project, approved by the board of directors of the Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd. dated in Nov.3 2004.
12.	Proxy letter of application of CDM project with Hunan province science technology information institute, dated on Feb. 23 2005.
13.	Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project *formulated by State Electric Power Corporation in*

Reference No.	Document or Type of Information
	2003 (The financial benchmark IRR of total investment is 8%.)
14.	The contract of sales electricity with Hunan province Power Company, signed in Dec. 2006
15.	The approval connected to the Hunan province grid, issued by Hunan province Power Company, dated in June 8. 2004.
16.	Purchasing contract of generation units with Tianjing Alstong Hydro Power Devices Co., Ltd. No. SHW2004-01, dated in Dec. 2004.
17.	Purchasing contract of main transformer with Hengyang transformer Co., Ltd. dated August 2006
18.	The evidence materials for Local Stakeholder Comments
19.	Evidence of the capital source
20.	The license of the company
21.	The design report of occupied land and immigrant resettlement, written by the survey and design institute for water conservancy and water power in Hunan province, dated in Dec. 2005,
22.	The approval of the design report of occupied land and immigrant resettlement, issued by the Hunan province government, Xiangzhenghan(2006)22, dated on Jan. 27, 2006.
23.	Approval of water conservation design, issued by Hunan province water conservancy department, dated on July12 2004
24.	Approval of pre-utilization land, issued by Hunan province land resources department, dated on Sept. 6, 2004.
25.	Monitoring manual and emergency program of the project, defined in Oct. 2006
26.	The survey report of the hydro power stations which capacity is above 15MW since 2002, issued by the survey and design institute for water conservancy and water power in Hunan province, dated on Oct. 31, 2006,
27.	The evidence of the surface area and the 3 flooded small scale hydro power stations
28.	Evidence of resettlement and stakeholder's consultation of Tongwan Project, submitted on October 13 2007
29.	Tongwan 180 MW Hydro, MoC 2007-03-31, submitted on October 13 2007
30.	Tongwan 180 MW Hydro, LoA Vrom, 2007-09-10, submitted on October 13 2007
31.	Tongwan 180 MW hydro, LoA Sv, 2007-09-04, submitted on October 13 2007
32.	Final PDD, version 5
33.	Tongwan 180 MW Hydro HCA 2007-11-05, submitted on November 5 2007
34.	Assessment Report of Bank Loan Application of Tongwan Hydropower Plant (Huaizhongyinfa [2005] No.7)
35.	Proof documents from local government about resolution of opinions raised in stakeholders' consultation in Section E
36.	All the footnotes and weblinks mentioned in final PDD
37.	Yearbook of China Water Resources 2006, China Energy Statistical Yearbook 2004, 2005, 2006, China Electric Power Yearbook

Reference No.	Document or Type of Information
	2002, 2003, 2004, 2005, 2006. IPCC 2006.
38.	Classification & Design Safety Standard of Hydropower Projects (DL5180-2003
39.	Instruction about the Engineering Characteristics of Tongwan Hydropower Plant, Hunan Hydro & Power Design Institute
40.	Approval Regarding the Bank Loan Application from Hunan Zhongfang Tongwan Water Resources & Hydropower Development Co., Ltd, Gongyinhuaihan [2005] No. 3, 17 March 2005
41.	Explanation of Increased Land Occupation Compensation Investment, Hunan Xiangyi Resettlement Engineering Supervision Company, 20 September 2006
42.	Minutes of Governor’s Work Meeting, 12 July 2004
43.	Engineering Construction Contract of Anjiang Flood Embankment, signed on 14 February 2007
44.	Report of CDM Development in Hunan Province, HNSTI, Xiangkexin [2005] No.15, 5 July 2005
45.	All links included in the Report