



VALIDATION REPORT
For the CDM Project Activity

HEBEI YUXIAN SECOND PHASE
49.5MW WIND POWER PROJECT
IN
CHINA

Report No. 01 997 9105049839

Version No. 7.0, 2011-03-12

TÜV Rheinland Japan Ltd.

I. Project description:

Project title: Hebei Yuxian Second Phase 49.5MW Wind Power Project
Host Country: China
Methodology: ACM0002 version 12.1.0 ☒ Large Scale ☐ Small Scale
Annual average emission reductions (estimate): 111,243 tCO₂e/yr
GHG reducing measure/technology:

Party	Project Participants	Party considered a project participant
P.R. China (host)	Hebei Construction Investment Yuzhou Wind Energy Co., Ltd.	No
Netherlands	Swiss Re Global Markets Limited	No

II. Validation:

Contract party: Hebei Construction Investment Yuzhou Wind Energy Co., Ltd

Validation Team:

Role	Full name	Appointed for Sectoral Scopes	Affiliation
Team Leader	Jiandong Ma	1	TÜV Rheinland Shanghai Ltd.
Team Member	Sequoia A	1,4	TÜV Rheinland Shanghai Ltd.
Technical Reviewer	Wilfred Chan, Manfred Brinkmann	1, 6, 13 1, 5/11/12, 13	TÜV Rheinland Hongkong Ltd. TÜV Rheinland Japan Ltd.

Validation Phases:

- ☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Validation Status:

- ☒ Corrective Actions / Clarifications Requested
☒ Full Approval and Submission for Registration
☐ Rejected

III. Validation Report:

Report No.: 01 997 9105049839	Current revision No.: 7.0	Date of current revision: 2011-03-12	Date of first issue: 2009-05-05
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Final approval: ☒	Released on: 2011-04-14 By Dr.Manfred Brinkmann	Designated Operational Entity (DOE): TÜV Rheinland Japan Ltd. Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama, JAPAN 222-0033 Tel.: +81 45 470 1850, Fax: +81 45 470-2361 E-mail: cdm@tuv.com
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Executive Summary – Validation Opinion

The validation team assigned by the TÜV Rheinland Japan Ltd. concludes that the CDM Project Activity “Hebei Yuxian Second Phase 49.5MW Wind Power Project” in China, as described in the PDD (version 7.0 of 12 March 2011), meets all relevant requirements of the UNFCCC for criteria for the Clean Development Mechanism including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

Based on the recommendations in the Validation and Verification Manual /6/, the review of the project design documentation and the subsequent follow-up interviews have provided the validation team with sufficient evidence to determine the fulfillment of stated criteria.

The Validation was executed in the following steps so far:

- Project desk review (PDD version 02, 7th July 2008)*
- Public stakeholder comment process (13th November 2008 to 12th December 2008)*
- On-site visit with stakeholder interviews (23rd December 2008)*
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol (Version 00, 5th May 2009)*
- Desk review of revised PDD (version 7.0, 12th March 2011)*
- Review of proposed correction and clarifications*
- Issue of the final validation report & protocol*

The project host Party is China and the Annex I Party is Netherlands. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA of China issuing the Letter of Approval of the project activity confirmed that the project assist in achieving sustainable development. The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China. The project correctly applies ACM0002 version 12.1.0: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

By generating renewable energy from wind power plant, the project will displace fossil fuel based grid electricity. The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project 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. The selected baseline/monitoring methodologies are applicable to the project and correctly applied.

The total emission reductions from the Hebei Yuxian Second Phase 49.5MW Wind Power Project are estimated to be on an average 111,243 tCO₂e per year over the selected 7 years crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

General training and monitoring procedures has been developed and will be implemented before the starting of the crediting period.

In summary, it is Validation Team’s opinion that the “Hebei Yuxian Second Phase 49.5MW Wind Power Project” in China as described in the PDD version 7.0 of 12 March 2011 meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 version 12.1.0. Validation Team thus requests the registration of the project as a CDM project activity

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DRC	Development and Reform Commission
EB	Executive Board
EIA	Environmental Impact Assessment
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hours
GWP	Global Warming Potential
I	Interview
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval.
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NGO	Non-governmental Organisation
NEPG	Northeast Power Grid
NCPG	North China Power Grid
CCPG	Centre China Power Grid
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PDR	Preliminary Design Document
PE	Project Emission
PP	Project participant
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added Tax

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1 INTRODUCTION

The Hebei Construction Investment Yuzhou Wind Energy Co., Ltd has commissioned the DOE TÜV Rheinland Japan Ltd. to perform a validation of the CDM Project Activity “Hebei Yuxian Second Phase 49.5MW Wind Power Project” in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. The term “UNFCCC criteria” refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures or the simplified modalities and procedures for small-scale CDM project activities (as applicable) and the subsequent decisions by the CDM Executive Board.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual, focused on the identification of significant risks for project implementation and the generation of CERs.

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

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- II on-site visit and follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report with its opinion.

The following sections outline each step in more detail.

2.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ Redox International Consulting (Beijing) Co. Ltd, Project Design Document for Hebei Yuxian Second Phase 49.5MW Wind Power Project, Version 2.0, 7 July 2008
- /2/ Redox International Consulting (Beijing) Co. Ltd, Project Design Document for Hebei Yuxian Second Phase 49.5MW Wind Power Project, Version 7.0, 12 March 2011
- /3/ Letter of Approval by DNA of China is issued in July 2008, Ref. No.1311
- /4/ Letter of Approval by DNA of Netherlands is issued on 16 December 2008, Ref. No. SN.2008-265/SB/RLA
- /5/ Modalities of Communication is submitted on 7 July 2009
- /6/ *Validation and Verification Manual*, version 01.2, EB 55
http://cdm.unfccc.int/Reference/Manuals/accr_man01.pdf
- /7/ CDM-PDD - Project Design Document form, **Version 3.0**
http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html
GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD) AND THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES (CDM-NM), **Version 07**
<http://cdm.unfccc.int/Reference/Guidclarif/pdd/index.html>
- /8/ ACM0002, “Consolidated methodology for grid-connected electricity generation from renewable sources”, version 12.1.0
<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>
- /9/ AM_Tool_01 “Tool for the demonstration and assessment of additionality” Version 05.2 (EB 39 Annex 10) <http://cdm.unfccc.int/Reference/tools/index.html>
- /10/ AM_Tool_07 “Tool to calculate the emission factor for an electricity system” Version 02 <http://cdm.unfccc.int/Reference/tools/index.html>
- /11/ CDM EB, Answer to DNV’s request for deviation of Chinese project activities from AM0005, received on 1 December 2005. <http://cdm.unfccc.int/Projects/Deviations>
- /12/ Hebei Electric Design and Research Institute, Feasibility Study Report of the project in December 2007 and the approval letter issued by Hebei Development and Reform Commission on 12 December 2007 Ref. No. Jifagainengyuanhezi 2007(145).
- /13/ The Institute of Hydrogeology and Environmental Geology, CAGS, Environmental Impact Assessment of the project on 6 August 2007, and the approval letter by Hebei

- Environment Protection Bureau on 27 September 2007. Ref. No. Jihuanbiao[2007]283
- /14/ Chinese DNA's guidance for the determination of grid boundaries and emission factors 2008, <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1053.pdf>
- /15/ China Electric Power Yearbook 2003-2007
- /16/ China Energy Statistical Yearbook 2005, 2006 and 2007
- /17/ 80 Copies of stakeholders consultation questionnaires.
- /18/ Project IRR calculation spreadsheet dated 20 May 2009 &
Project IRR calculation spreadsheet dated 1 January 2011
- /19/ Guidance on the Assessment of Investment Analysis: (Version 3.1) from EB51
http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf
- /20/ Guideline on the demonstration and assessment of prior consideration of CDM, version 03, annex 22, EB49
http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid04.pdf
- /21/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- /22/ The approval letter for the proposed project connecting to grid by Hebei Provincial Power Company dated 27 August 2007. No. JiDianYingXiao (2007)67
- /23/ Notice on Strictly Prohibiting the Installation of Thermal Generators with the Capacity of 135MW or below issued by the General Office of the State Council, Decree No. 2002-6
- /24/ Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects, version 03, issued by State Power Corporation of China in 2006.
- /25/ China Wind Power Industry Development Report (2006), Shi Peng Fei,
Statistics of Chinese Wind Energy Installed Capacity in 2007, Shi Peng Fei,
- /26/ Emission Reduction Purchase Agreement between the project owner and Swiss Re Global Markets Limited dated 28 March 2008
- /27/ CER calculation spreadsheet
- /28/ Evidence of sensitivity analysis:
Markup direction the price of production:
http://www.stats.gov.cn/tjfx/jdfx/t20080310_402466888.htm published on 10 March 2008 by National Statistical Bureau
The price if turbines increasing presented on wind power guild web:
<http://www.86wind.com/info/detail/4-5335.html> published on 16 January 2008
The direction of tariff:
0.984RMB/kWh of 2005 from study on Pricing of Wind Power in China by Shipengfei published in 2006;
0.650 & 0.600RMB/kWh of 2006 from the approval letter of HeBei Bureau of Price, No. Jijiaguanzi 2006(57);
0.540 RMB/kWh in 9 June 2007 No. Fagainengyuan2007(1260) & in 3 December 2007 No. Fagainengyuan2007(3303) and in 26 July 2008 No. Fagainengyuan2008(1876)
- /29/ The standard for calibration: Chinese electric industry regulation DL/T448-2000
- /30/ The result of EF calculated by China NDRC, which was published on 18 July 2008 :

- <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/20081230102527637.pdf> -- CM
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/20081231101111351.pdf> -- BM
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1888.pdf> -- OM
- /31/ 02 October 2008, A written confirmation from Chinese NDRC in the Notification form, that PPs previously informed on commencement of the project activity and of their intention to seek CDM status
- /32/ The evidence of Tax in IRR in calculation:
Revenue Tax rate 25% from China Revenue Tax Law published in 2007
residual rate 5% from Guoshuihan 2005(883)
City Build tax: 1% from No.GuoFa1885(19)
City Build tax and Education tax: 3% & 1% from Decree No.448 of the State Council and Decree No.8 (2003) of the Hebei provincial government.
Local education tax: 1% from Ling (2003) 8 of Hebei Provincial Government.
VAT 8.5% from Caishui No.2001(198)published by National Ministry of Finance and Revenue Bureau
- /33/ National Standard (GB/T 18710-2002), Methodology of wind energy resource assessment for wind farm
- /34/ Construction contract signed dated 13 August 2008
- /35/ The construction starting order issued by the construction supervising company on 15 August 2008
- /36/ 33 sets of tower contract signed on 21 August 2008
33 sets of tranformer contract signed on 16 August 2008
- /37/ The turbines and generators purchased contract regarding FD70B signed on 27 August 2008
The turbines and generators purchased contract regarding FD77B signed on 27 August 2008
- /38/ The evidence of tariff available used in FSR:
Approval letter to wind power projects regarding bus-bar tariff. NDRC Price [2007]3303 on 3 December 2007
http://www.gov.cn/zwgk/2008-02/19/content_892937.htm, and
[2007]1260, dated 9 June 2007
[2008]1876 on 23 July 2008,
http://www.gov.cn/zwgk/2008-08/14/content_1071728.htm :
0.54RMB/Kwh (VAT incl.)
- /39/ Hebei Provincial Pricing Bureau, Approved letter regarding tariff of Chengde Hongsong wind farm and Shangyi Manjing wind farm, JiJiaGuanZi(2006)57
- /40/ Beijing Jipeng Investment Information Consulting Co, Ltd. FSR of Chengde Hongsong wind farm phase II project, March 2003
Tariff estimated as 0.73RMB/kWh (VAT incl.)
- /41/ Beijing Guodian North China Power Engineering Co, Ltd. FSR of Shangyi Manjing wind farm project (revision), December 2003
Tariff estimated as 0.679RMB/kWh (VAT incl.)
- /42/ VCS reports for Shangyi Manjing East for 2007
<http://www.carbonneutral.com/cnregistry/projectdetail.asp?project=Shangyi%20Manjing%20Wind%20Farm>
the bulletin regarding VCU of Chengde Hongsong wind farm in 2005

- http://www.personal.barclays.co.uk/PFS/A/Content/Files/3370_Bar_CN_Wind_China_V3.pdf
- /43/ Notice of National Council Issued about the Power System of Organization Reform Programme published on April 11, 2002, had presented Separate Power Plants from Network and Compete in Price to Enter Network:
<http://www.chinapower.com.cn/article/1000/art1000014.asp>
- /44/ Website of DNA of China regarding CDM, <http://cdm.ccchina.gov.cn/web/index.asp>
Website of DNA of Netherlands regarding CDM,
http://www.senternovem.nl/carboncredits/approval_procedure/participation_in_cdm_project.asp
- /45/ Bulletin regarding china wind energy industry dialogue capital forum including the investment cost <http://china.toocle.com/cbna/item/2009-06-02/4607622.html>
- /46/ Renewable Energy-Technology, Economics and Environment, page 342, Hamburg/Leipzig, Graz, Frankfurt, January, 2007
- /47/ Chinese statistics report news regarding industrial products price index in 2008.
http://www.stats.gov.cn/tjfx/jdfx/t20080310_402466888.htm
- /48/ EB48, annex 11, the guidelines for the reporting and validation of plant load factors
- /49/ Loan agreement signed by the project owner with China Bank Shijiazhuang Huayu branch of No.ShiZhongYinHuaJieZi2009017.
Capital fund receipts notified and issued by the Bank respectively on 23 May 2008, 24 May 2008, 20 June 2008, 21 February 2008, 22 February 2008 and 29 February 2008.
- /50/ Notification to invite local stakeholders issued by the project owner dated 8 October 2007.
- /51/ Clarification regarding power output estimates based on actual turbines by Hebei Electric Design and Research Institute in 2010
- /52/ Hebei Electric Power Construction Supervising Company, the Confirmation Letter on the actual coordinates of the project, dated 19 April 2010
- /53/ NDRC, Notice regarding regulation of grid-in tariff for wind farm, dated 20 July 2009(fagaijiage(2009)1906
<http://www.china5e.com/show.php?contentid=48286>
- /54/ <http://www.wp-forum.cn/ArticleShow.asp?nid=2713E111-173F-4C22-A6FF-CEB7719F4ABB>
- /55/ <http://www.fjjg.gov.cn/fjwj/jgfw/gjjgzc/webinfo/2002/02/1187774415686122.htm>
- /56/ <http://hbrb.hebnews.cn/20050617/ca503582.htm>
- /57/ Hebei Planning Commission, (Jijiwai(1995)No.1021), dated 23 November 1995;
Power Ministry of China, (Dianansheng(1997)No.190), dated 8 April 1997.
FSR approval of the Zhangbei Changcheng wind project,
- /58/ Hebei Planning Commission, FSR approval of Hebei Hongsong Phase I (Jijiziyuan(2000)1028), 13 November 2000.

2.2 Follow-up Interviews with Project Stakeholders

On 23 December 2008, the validation team performed an interview to resolve the issues identified during the desk review of the project design document. The representatives of Redox International Consulting (Beijing) Co. Ltd. and Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. was interviewed.

Table below shows the list of issues discussed during the site visits:

	Date	Name	Organization	Topic
/59/	2008-12-23	YANG Xiaohua ZHAO Yongchao	Hebei Construction Investment New Energy Co., Ltd.	– Project background information – Project technology, operation, maintenance and monitoring capability – Project additionality – Project financial structure – Project monitoring and management plan – Project approval status – Stakeholder consultation process
/60/	2008-12-23	ZHU Qingrong YUAN Xue	Redox International Consulting (Beijing) Co. Ltd.	– Project design document – Baseline determination – Emission reductions calculation – Project additionality – Status of LoAs

2.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to the validation team's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification 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 for this project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- mistakes have been made with a direct influence on project results;
- CDM and/or methodology specific requirements have not been met; or
- there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	Reference	Conclusion
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	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.	This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the 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 2, under "Final Conclusion".

Figure 1. Validation protocol tables

2.4 Internal Quality Control

The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

2.5 Validation Team

Role	Full Name	Appointed for Sectoral Scopes	Affiliation
Team Leader	Jiandong Ma	1	TÜV Rheinland Shanghai Ltd..
<i>Team Member</i>	Sequoia A	1,4	TÜV Rheinland Shanghai Ltd.
Technical Reviewer	Wilfred Chan	1, 6, 13	TÜV Rheinland Hongkong Ltd.

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

3.1 Approval and Participation

The project participants are Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. of China and Swiss Re Global Markets Limited of the Netherlands. The host Party China and the participating Annex I Party meet the requirements to participate in the CDM.

The letter of approval from the DNA of China in July 2008/3/ has authored Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. as project participant and also confirmed that the project assists in achieving sustainable development.

The letter of approval from the DNA of the Netherlands on 16 December 2008 /4/authorized Swiss Re Global Markets Limited. as project participant.

The validation team had received the LoAs from PP.

No public funding from an Annex I Party is involved in the project. By reviewing of documents/49/ it is found that 408.02 million RMB is loaned from China Bank Shijiazhuang Yuhua Branch and 113.19 million RMB is capitalized by the project owner the total of which is 521.21 million RMB comparing with the estimated investment cost of 494.65 million RMB in the FSR and on-site interview during the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

The authenticity of the letters of approval from DNA of China and Netherlands has been validated by checking the website of DNA of China and Netherlands regarding CDM/44/

These LoA(s) are therefore regarded as valid and meeting the requirements.

Project participants	1. Hebei Construction Investment Yuzhou Wind Energy Co., Ltd	2. Swiss Re Global Markets Limited
Parties involved	P.R. China (host)	Netherlands
APPROVAL		
LoA received	Yes	Yes
Date of LoA	2008-07	2008-12-16
Reference to document	Ref. 1311	Ref. SN.2008-265/SB/RLA
LoA received from	PP	PP
Validation of authenticity	Original check	Original check
Validity of LoA	Valid	Valid
PARTICIPATION		
Party is party to Kyoto Protocol	Yes	Yes
Voluntary participation	Yes	Yes
Diversion of official development aid towards host country	NA	No
Project contribution to SD	Yes	NA

3.2 Project Design Document

The Project Design Document is based on the currently valid PDD template and is completed in accordance with the applicable guidance document /7/.

3.3 Project Description

The objective of the proposed project activity will be to generate electricity by utilizing wind resources through the installation and the operation of 49.5MW wind farm. The electricity generated will be delivered to the North China Power Grid (NCPG)/12/&/22/ through a transformer from 690V to 35kV, which will be connected to the 35/110kV substation on the wind farm. All the electricity generated by the wind farm will be transferred to the NCPG via the 220/500kV grid substation. Based on FSR and grid access approval from Hebei Provincial Power Company/12/&/22/, the building scheme had been checked and confirmed by the validation team.

The project is located at Xiushuipeng Village approximately 18 km from Xiagongcun Town in the southwest of Yuxian County, Zhangjiakou City of Hebei Province. The central geographical coordinates of the project are 114°32'2.12"E, 39°35'0.71"N, which is confirmed by checking FSR/12/ and the Confirmation Letter on the actual coordinates of the project issued by the Construction Supervising Company/52/.

The project's system boundaries are clearly defined as the wind farm and the North China power grid (NCPG). The proposed project will involve the installation and the operation of 33 sets of wind

turbines with each of a capacity of 1500 kW. As per the FSR/12/, the installation also includes one set of main transformer of 50MVA, measurement and surveillance of the wind farm operation.

During site visit period, audit team saw the project was being constructed.

The project will generate greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions from electricity generation by fossil fuel power plants and it is expected to have a net annual power output of 112,170MWh at a plant load factor of 25.86% i.e.2266 operation hours per year. The power generation has been determined, by a third party design institute calculation, in the page 26 and page 65 to 69 of FSR/12/ based on the historical wind data of year 1975 to 2004 from the local weather station, Estimation on electricity output to grid was calculated on energy loss estimation, which included air density, wind turbine efficiency, contamination of rotor blades, turbulent flow influence, transmission loss & auxiliary power use, correction on power curve, weather influence and others, and are carried out using professional WASP software (www.wasp.dk) designed for wind energy, then, an average load factor of 25.86% has been applied. The feasibility study report of the project in December 2007 developed by Hebei Electric Design and Research Institute, and the approval letter by Hebei Provincial Development and Reform Commission on 12 December 2007/12/. The document had been verified and confirmed by the validation team.

The purchasing agreement of the turbine and the generator was signed on 27 August 2008 between owner and equipment supplier/37/ and construction contract signed on 13 August 2008/34/, which date was as the project activity started date. The validation team is able to confirm this earliest date when PP have committed to expenditures related to the implementation or related to the construction of the project activity. As per the approved FSR /12/ the expected operational lifetime of the project activity is 20 years which is confirmed by checking the contract for purchasing equipment/37/. A renewable crediting period of 7 years has been chosen by the project participants starting on 1 July 2011. The project is expected to reduce GHG emissions of estimated 111,243 tCO₂e per year and 778,701 tCO₂e over the first seven-year crediting period.

The validation team confirmed that the proposed project activity fulfills the Chinese domestic regulations and policy of promoting sustainable development. The project is in line with host-Party specific CDM requirements and the confirmation thereof by the DNA of China was issued in July 2008(LoA) /3/.

The project description is to the consideration of the validation team complete and accurate

<i>Starting date of project</i>	<i>Expected project operational lifetime</i>	<i>Crediting period</i>
13 August 2008	20 years	7 years renewable crediting period and starting of the first crediting period will be 1 July 2011.

3.4 Baseline and Monitoring Methodology

3.4.1 Applicability of the selected methodology to the project activity

The project applies the approved baseline methodology ACM0002 (version 12.1.0), “Consolidated methodology for grid-connected electricity generation from renewable sources”/8/. The applied baseline methodology is justified as the project activity fulfills the following criteria:

- It is a grid connected zero emission renewable power generation activity from wind resources which is confirmed by checking the grid access approval /22/and FSR/12/

- It does not involve switching from fossil fuel to renewable energy at the project site which is confirmed according to FSR/12/;
- The project boundary is clearly defined as the project site and the grid electricity system boundary, which is defined as the NCPG including the grids of Beijing City, Tianjin City, Hebei, Shanxi, Shandong and Inner Mongolia Autonomous Region, on the basis of information announced by NDRC in December 2008 /14/. There are no significant transmission constraints between the power plants of the NCPG/14/. The selected sources and gases are justified for the project activity.

The validation team had verified these documents during desk review period. Audit team had cross-checked the type of equipments and the installation of transmission lines according to these documents on site.

- Thus, the validation team considered the selected methodology applicable to the project activity

3.4.2 Project Boundary

The spatial extent of the project boundary is clearly defined according to ACM0002 /8/and the approval of grid access by Hebei Provincial Power Company /22/as the site of project activity and all power plants connected physically to NCPG including Hebei Power Grid, to which the project is connected.

This is in line with the delineation of grid boundaries as provided by the DNA of China in December 2008/14/. There are no significant transmission constraints between the power plants of the NCPG including Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia and Shandong.

The relevant information is sourced from web-site referenced in PDD. DOE has checked the information and be able to confirm it. The baseline determination is transparent and reasonable.

- The defined project boundary is in line with ACM0002 (version 12.1.0)/8/. Emissions sources included in or excluded from the project boundary:

	GHGs involved	Description
Baseline emissions	CO ₂	Main emission source from Grid
Project emissions	CO ₂	No supplementary fossil fuel required as confirmed during on-site visit
Leakage	CO ₂	According to ACM0002/Version 12.1.0, the Leakage of wind power project activity is Neglected

3.4.3 Baseline Identification

According to the description in the approved baseline methodology ACM0002, if the project activity is the installation of a new renewable power plant, the baseline scenario is the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”/10/

Based on FSR/12/ and pre-permit from Grid Company/22/, the project activities will do not modify or retrofit an existing electricity generation unit or plant and will be connected to North China Power Grid. So North China Power Grid is considered as the “project electricity system”, which is defined as

the “project boundary” of the proposed project.

According to China Electric Power Yearbook/15/, The NCPG is dominated by coal-fired power plants. It is deemed likely that coal-fired power plants will continue to dominate the power sector due to the local availability of low-cost coal. It is expected that renewable capacity additions will not have significant effects on the mix of the NCPG during the first crediting period.

The validation team has verified the documents/12//&/14/&/22//and confirmed the baseline scenario of the project has been demonstrated to be that an equivalent amount of electricity would, in the absence of the project activity, have been generated by the operation of grid-connected thermal power plants and by the addition of new generation sources.

Emission sources and gases related to the baseline scenario, project scenario and leakage included in project boundary comply with the methodology applied. Section B.3 of PDD includes a diagram as indicated in the Guidelines for completing the Project Design Document (CDM-PDD) (EB41) which clearly shows the project boundary and the physical delineation of the project activity.

In accordance with the approved methodology ACM0002/Version 12.1.0 /8/, the electricity baseline emission factor is determined ex-ante as a combined margin, consisting of the weighted average of the operating margin(OM) emission factor and the build margin(BM) emission factor (as explained in section 3.6 and 3.4.4). In line with the default values stipulated by the methodology for wind farm projects, weighting is set to 75% and 25% for OM and BM respectively.

The baseline scenario of the project has been demonstrated to be that an equivalent amount of electricity would, in the absence of the project activity, have been generated by the operation of grid-connected thermal power plants and by the addition of new generation sources.

In conclusion, it is the validation team’s opinion that the baseline scenario is correctly and reasonable.

<i>The approved baseline methodology applicable to the project</i>	☒ Yes ☐ No	ACM0002/Version 12.1.0
<i>PDD includes all assumptions and data used by project participants</i>	☒ Yes ☐ No	Emission sources and gases related to the baseline scenario, project scenario and leakage included in project boundary comply with the methodology applied. Section B.3 of PDD includes a diagram as indicated in the Guidelines for completing the Project Design Document (CDM-PDD) (EB41) which clearly shows the project boundary and the physical delineation of the project activity
<i>All the references and documents used are relevant for establishing the baseline scenario</i>	☒ Yes ☐ No	Full argument and references has been carried out in this section and PDD.
<i>All the references and documents used are correctly quoted and conservatively interpreted in the PDD</i>	☒ Yes ☐ No	The FSR and its approval, the China Electric Yearbook has been correctly quoted and conservatively interpreted in the PDD.
<i>All relevant policies / regulations considered are listed in the PDD</i>	☒ Yes ☐ No	All relevant policies / regulations considered in PDD.
<i>Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity</i>	☒ Yes ☐ No	The approved baseline methodology ACM0002/version 12.1.0 has presented clearly the baseline.

<i>The baseline scenario selection is appropriate and determined according to the methodology</i>	☒ Yes ☐ No	The baseline scenario selection that coal-fired power plants will continue to dominate the power sector due to the local availability of low-cost coal.
<i>The approved methodology used is applicable to the identified baseline scenario</i>	☒ Yes ☐ No	The approved methodology has identified baseline scenario: Electricity delivered to the NCPG by the proposed project would have otherwise been generated by the operation of grid-connected power plants in the NCPG and by the addition of new generation sources in the NCPG.

3.4.4 GHG Emission Reductions

The emission reduction ER_y by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (Ly), as follows:

- 1) Baseline emissions: baseline emissions (BE_y in tCO₂) are the product of the baseline emissions factor (EF_y in tCO₂/MWh) times the net electricity supplied by the project plant/unit to the grid in year (EG_y in MWh/y) as the proposed project activity is the installation of a new grid-connected renewable power plant where no renewable power plant was operated prior to the implementation of the project activity.
- 2) Project emissions: there are no emissions from the project as a renewable wind energy project according to ACM0002/8/and which is confirmed by checking FSR/12/.
- 3) Leakage: no leakage has to be considered for the proposed project activity according to ACM0002/8/.
- 4) Emission reduction: $ER_y = BE_y - PE_y = BE_y$.

The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) according to “Tool to calculate the emission factor for an electricity system” of version 1.1 /10/.

The PDD used the available data for calculation of the grid emission factor with China Energy Statistics Yearbooks 2005-2007/16/ and China Electric Power Yearbooks 2003-2007/15/ and relevant result of calculation published by Chinese DNA in December 2008/30/ This was the most data available at the time of submission of the CDM-PDD to the DOE for validation (13 November 2008).

According to the data from China Electric Power Yearbook /15/, the low-cost/must run resources constitute only 0.89% in 2002, 0.86% in 2003, 0.76% in 2004, 0.75% in 2005 and 0.79% in 2006 among total electric power generation of NCPG. Therefore, the operating margin (OM) is calculated using the “simple OM” method which is justified because low cost and must run power plants constitute less than 50% of the total grid generation.

The aggregated generation and fuel consumption data are used due to the fact that more disaggregated data are not available in the NCPG. Country specific data for net calorific value (NCVi) of each type of fossil fuel from China Energy Statistics Yearbook/16/, the IPCC 2006 default values for the oxidation factor of each type of fossil fuel/21/and the total electricity delivered to the NCPG from China Electric Yearbook/15/ are selected and are deemed reasonable. Vintage data for the years 2005, 2006 and 2007 from China Energy Statistics Yearbooks/16/ and China Electric Power Yearbooks 2005-2007/15/ editions are used for the operating margin calculation. According to the tool/10/ the

CO₂ emission factor of each type of fossil fuel should be default value at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories if the IPCC 2006 default value are adopted.

According to Tool to calculate the emission factor for an electricity system /10/ referred by ACM0002 version 12.1.0 /8/, because net imports from other electricity systems are occurred in the project electricity system, the weighted average operating margin emission rate of the exporting grid is adopted by PP in line with relevant information of DNA of China/30/ and exports should not be subtracted from electricity generation data used for calculating the baseline emission according to Tool to calculate the emission factor for an electricity system/10/. Project electricity system of the proposed project is NCPG and the imported power generation (2,618,060MWh) from NEPG to NCPG is only 0.39% of the total generation (669,506,473MWh) from NCPG, the electricity imports (497,060MWh) from CCPG to NCPG is only 0.07% of the total generation from NCPG, furthermore these two percentages have not changed significantly in recent years, so the respective average emission rate of NEPG and CCPG is taken as the emission factor of the import electricity which is determined according to Tool to calculate the emission factor for an electricity system/10/.

Based on these data, the simple OM emission factor of North China Power Grid (NCPG) is calculated as 1.0326tCO₂/MWh as a generation-weighted average for the three years, which can be verified with the spreadsheet for OM calculation from China DNA/30/.

Because plant specific fuel consumption and electricity generation data is not publicly available in China, the EB guidance on the request for deviation titled “Application of AM0005 and AMS-I.D in China” /11/ has been applied for this project. Following the EB’s guidance the build margin is calculated as follows:

- Use of capacity additions from the years 2004 to 2006 is chosen and reach 33.79% of the total installed capacity of NCPG;
- Use of weights estimated using installed capacity in place of annual electricity generation. Thermal power plant accounts for 95.64% of the total installed capacity additions in this period for NCPG. Since specific data for each technology is not available, the weight of CO₂ emission by each fuel (coal 98.93%; natural gas 0.97%; oil 0.09%) was estimated respectively from the fuel consumptions and net calorific values used by relevant power sources referred to the China Energy Statistical Yearbook /16/ and the CO₂ emission factor of each type fuel referred to 2006 IPCC Guidelines for National Greenhouse Gas Inventories/21/.
- Use of the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption. This is 37.28% for coal power plants and 48.81% for oil power plants and gas power plants /30/.

Country specific net calorific value of each kind of fuel, country specific emission factor of each fuel and IPCC 2006 default values of oxidization factors are used to calculate the BM. The data applied are considered as the best data available for calculating the BM in China. The official supporting documentation has been verified. The BM is calculated as 0.8690tCO₂/MWh.

The weights ω_{OM} and ω_{BM} are selected as 0.75 and 0.25, respectively, for the wind farm project by the default stipulated in the methodology. The combined margin of 0.99174tCO₂/MWh is fixed ex-ante for the entire first crediting period.

According to FSR/12//, the proposed project activity is estimated to supply 112,170MWh per year, the calculation result of the estimated emission reduction is totally 111,243 tCO₂ per year for the proposed project.

The latest data used to calculate OM and BM are derived from China Energy Statistical Yearbooks 2005 to 2007 /16/ and from China Electric Power Yearbooks 2005 to 2007/15/.

The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by the validation team.

- In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found

<i>All assumptions made for estimating GHG are listed in the PDD</i>	☒ Yes ☐ No	The estimated emission reduction is totally 111,243 tCO ₂ per year for the proposed project
<i>All data used by project participants are listed in the PDD</i>	☒ Yes ☐ No	Detail listed in section B6.2 of PDD/2/
<i>Their references and sources are also listed in the PDD</i>	☒ Yes ☐ No	China Electric Power Yearbooks 2003-2007 /15/ China Energy statistics Yearbooks 2005-2007/16/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories/21/ The result of EF calculated by China NDRC , which was published in December 2008 /30//
<i>Formulas, parameters, values are complete, accurate, transparent and conservative</i>	☒ Yes ☐ No	Detail listed in section B6.1 & Annex 3 of PDD/2/
<i>All the references and documents used are correctly quoted and conservatively interpreted in the PDD</i>	☒ Yes ☐ No	All the references and documents used in PDD have been verified and confirmed by DOE
<i>Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions</i>	☒ Yes ☐ No	Since the project activity is the installation of a new grid-connected renewable power plant/unit, the applicable Methodology is as following: Approved Baseline & Monitoring Methodology: ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources”, version 12.1.0 /8/ and AM_Tool_07 “Tool to calculate the emission factor for an electricity system” Version 01.1 /10/
<i>All the emissions of baseline emissions can be replicated using information provided in the PDD</i>	☒ Yes ☐ No	For the project activity, only a new grid-connected renewable power plant/unit will be installed as per FSR /12/ and the grid connection approval/22/, so baseline emissions include only CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity according to the methodology/8/

3.5 Additionality

According to the approved methodology ACM0002/Version 12.1.0 /8/, the additionality of the project has been established applying the “*Tool for the demonstration and assessment of additionality*” version 05.2, of EB39 Annex 10/9/.

Before the project activity started on 13 August 2008 when the construction contract was signed between owner and the construction company/34/as earliest date the project participant has committed to expenditures related to the implementation or related to the construction of the project activity, the financially unattractive/12/ without CER revenue of the project had been found during preparation of FSR which is completed in December 2007, after CDM income was considered, IRR just over benchmark/12/. The detail had been presented in FSR and the approval from local government on 12 December 2007/12/. In order to obtain the additional funding to secure the project financially, developer signed the emission reduction purchase agreement (ERPA) with Swiss Re Global Markets Limited on 28 March 2008/26/. Then, the construction contract for the project was signed between owner and the construction company on 13 August 2008/34/, as the project activity started. Further, on 02 October 2008, A written confirmation from Chinese NDRC was issued, that PPs previously informed on commencement of the project activity and of their intention to seek CDM status/31/. The validation team was able to confirm that the IRR in FSR was lower than benchmark without CER revenue and hence financially unattractive/12/.

3.5.1 CDM consideration

By checking the PDD and relevant evidences about project development, we confirm the timelines of project activity as following:

- 1, the environment impact assessment document (EIA) is completed on 6 August 2007 and the EIA approval is issued on 27 September 2007/13/
- 2, the feasibility study report is completed in December 2007 and the approval is issued 12 December 2007/12/
- 3, the construction contract is signed on 13 August 2008/34/
- 4, the construction starting order is issued on 15 August 2008/35/
- 5, the transformer contract is signed on 16 August 2008/36/
- 6, the tower contract is signed on 21 August 2008 /36/
- 7, the equipment contract is signed on 27 August 2008/37/

The project starting date is thus confirmed according to EB41 para 67 requirement that it is 13 August 2008 when the contract for project construction and installation of equipments was signed.

During FSR preparation, the CDM income had been taken into account, as the IRR with CER revenues just exceeded the benchmark/12/. The FSR was prepared by Hebei Electric Design & Research Institute completed in December 2007 and the approval letter by the Development and Reform Commission of Hebei province on 12 December 2007, Ref. No.Jifagainengyuanzi 2007(145)/12/. The third party attains the Class I consulting qualification (GongZiJia 2030805004) granted by NDRC./12/ In order to obtain the additional funding to secure the project financially, developer signed the emission reduction purchase agreement (ERPA) with Swiss Re Global Markets Limited on 28 March 2008/26/. Further, on 02 October 2008, a written confirmation from Chinese DNA was issued, that PPs previously informed on commencement of the project activity and of their intention to seek CDM status/31/. In July 2008 the LoA of China is issued. On 16 Dec.2008 the LoA of annex I party is issued. Since the proposed project started after 2 August 2008 (13 August 2008) and the LoA has been attained before the project start date, it is thus demonstrated according to the Annex 22 of EB49 that the CDM benefits were considered necessary in the decision to undertake the project as a CDM project activity and meets the requirements for early CDM consideration as stipulated in that guideline/20/.

Validation team had verified these documents and was able to confirm that CDM benefits were considered seriously in decision to undertake the project as a proposed CDM project activity.

The time period of three months between the project starting date (13 August 2008) and the publication of the PDD (13 November 2008) is sufficiently short to conclude that continuing and real actions were taken to secure CDM status for the project activity.

Starting date of project	Justification of and evidences (references) on the starting date of project	Date of CDM consideration
13 August 2008	1, the environment impact assessment document (EIA) is completed on 6 August 2007 and the EIA approval is issued on 27 September 2007/13/ 2, the feasibility study report is completed in December 2007 and the approval is issued 12 December 2007/12/ 3, the construction contract is signed on 13 August 2008/34/ 4, the construction starting order is issued on 15 August 2008/35/ 5, the equipment contract is signed on 27 August 2008/37/ The project starting date is thus confirmed according to EB41 para 67 that it is 13 August 2008 when the contract for project construction and installation of equipments was signed.	• FSR is completed in December 2007 and requires project owner to seek the support of CDM. • On 28 March 2008, ERPA was signed. • On 02 October 2008, A written confirmation from Chinese NDRC was issued • In July 2008 the LoA of China is issued • On 16 Dec.2008 the LoA of annex I party is issued.

3.5.2 Alternatives

Based on “Tool for the Demonstration and Assessment of Additionality (version 5.2)” which was approved in the EB39/9/, the alternative scenarios of the project activity have been identified in B.5 of PDD /2/, as below:

- a) The proposed project activity undertaken without being registered as a CDM project activity;
- b) Construction of a fossil fuel-fired power plant with equivalent capacity or equivalent amount of annual electricity output;
- c) Continuation of the current situation that is electricity generation provided by the NCPG.

According to the national regulation ” Notice on Strictly Prohibiting the Installation of Thermal Generators with the Capacity of 135MW or below issued by the General Office of the State Council, Decree No. 2002-6”/23/, coal-fired based power plants with installed capacity less than 135MW are forbidden to be constructed in areas covered by provincial grids. Thus, the scenario b) is not consistent with the current law and regulation.

Alternative a) and c) is in compliance with legal and regulatory requirements. So the scenario a) and c) are realistic and credible choice.

3.5.3 Investment analysis

A benchmark analysis (Option III of Step 2 of tool for the demonstration and assessment of additionality/9/) is selected for conducting the investment analysis. In China an IRR of 8% for the total investment of a project is regarded as a benchmark for investments in large scale hydropower plants, fossil fuel fired plants and wind farm projects/23/. This benchmark is deemed appropriate for this project. All input parameters used for investment analysis in the PDD are taken from the approved feasibility study report (FSR)/12/, based on the data of which the project IRR without CER revenues is 6.17 % /18/, which indicates that the project in the absence of CDM benefits is not financially attractive due to its IRR lower than the benchmark of 8%/24/..

3.5.3.1 Choice of approach

Since the proposed project generates financial and economic benefits through the sales of electricity, a simple cost analysis (option I) can not be applied. Secondly, the alternative (d) to the proposed project is not a similar investment project, so an investment comparison analysis (option II) is also not an appropriate choice. Thus the benchmark analysis (option III) has been applied for conducting the investment analysis as per the Guidance on the Assessment of Investment Analysis (Version 03.1)/19/..

3.5.3.2 Justification of benchmark selection

The validation team has reviewed the source of the economic benchmark for the project investment analysis used by the project participant and confirmed that it is the valid authoritative reference – “Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects” by the State Power Corporation of China/24/. As highlighted in section 1.11 of the reference document, it indicates that the project IRR of 8% is the benchmark used for the investments in hydropower plants, fossil fuel fired plants and wind farm projects. Thus, the validation team can confirm the 8% IRR benchmark (after tax) is appropriate for the investment analysis of the proposed project

3.5.3.3 Input parameters

A feasibility study report (FSR) in China is required to be developed by a third party accredited for this task directly by the government. An approval letter of the Feasibility Study is issued by the government only after it passes the public assessment of the sector experts designated by the government. A feasibility study report can in Validation team’s opinion thus be regarded as an accurate and trustworthy report coming from a recognized entity.

Considering the all data taken from the approved feasibility study report /12/, the IRR of the proposed project activity without CDM revenues accounts to 6.17%/18/, which indicates that the project is not economically attractive compared with the benchmark IRR. In line with the paragraph 54 of the EB38 report, the validation team confirms that:

The all data and parameters used for the financial analysis have been sourced from the feasibility study report (FSR) completed in December 2007/12/, developed by Hebei Electric Design & Research Institute and approval letter by the Development and Reform Commission of Hebei province on 12 December 2007 /12/.

Details on how key financial input values being independently cross-checked by the validation team with other means of validation are presented as follows:

a) The assumptions for the taxation and other input parameters

Further, the tax and debt used by IRR calculation had been cross-checked during validation period. The urban maintenance and construction tax, Education tax, Value-add tax rate, Residual rate and

Revenue tax rate are from revelation Chinese regulation/32/. The education tax of 4% includes: 3% is levied by Chinese government and 1% is levied by Hebei provincial government. The rate of the education tax and urban maintenance and construction tax should refer to certain percentage of the adopted VAT according to the Chinese laws.

b) The electricity tariff applied

■ **The applied tariff of 0.54RMB/kWh for investment analysis in the FSR/PDD is appropriate at the time of decision for investment of the proposed project.**

The tariff of 0.54RMB/kWh (incl. VAT) in the PDD used for financial analysis of the proposed project is derived from the approved FSR, the tariff of which is set based on the tariff approvals of Hebei province for other wind projects therein at that time of preparation of FSR/12/.

The Validation team verified that for the proposed project, the expected feed-in tariff of 0.54 RMB/kWh (including VAT) applied in the FSR was the most recently available at the time of the investment decision for the proposed project and is consistent with previous tariff approvals released to local wind farms in Hebei province as follows:

► Tariff approval document (Fa Gai Jia Ge [2007]1260) issued by NDRC on 09/06/2007, document No. Fa Gai Jia Ge[2007]1260/38/

► Tariff approval document (Fa Gai Jia Ge [2007]3303) issued by NDRC on 03/12/2007, document No. Fa Gai Jia Ge[2007]3303/38/

According to the notification on on-grid tariff policy (Fa Gai Jia Ge [2009]1906) issued by NDRC dated 20 July 2009/53/, There are four wind resource areas in China which classified based on the wind resource conditions and construction conditions. Wind resource area I represents the area with most abundant wind resources. Zhangjiakou City, where the proposed project is located, are classified as wind resource area II.

The Validation team also cross-checked the tariff used in the financial analysis of the proposed project with those of similar projects as demonstrated in table 0-1, and was able to confirm that the tariff used in the financial analysis of the proposed project is in within the range of other wind farms in Hebei Province with comparable capacity.

The validation team therefore concluded that the applied tariff of 0.54RMB/kWh for investment analysis in the FSR/PDD is appropriate, conservative and is considered to be in line with para.111 of the VVM.

■ **Comparison with other similar project**

All wind power projects in Hebei Province (both CDM and non CDM projects) are listed in Table 0-1.

Table 0-1: The actual approved electricity tariff of all wind farms in Hebei Province (both CDM and non CDM projects)

No	Time	Project	Feed-in tariff (RMB/kWh, incl VAT)	Reference	CDM
Prior to the Power Sector Reform (March 2002)					
	Construction	Zhangbei	0.65	JiJiaGe	Early

	finished in 1998/54/	Changcheng 9.85MW wind farm		[2002]242 issued by NDRC in Feb 2002/55/	demonstration and ODA funded projects
	construction finished in 2001/56/	Chengde Hongsong 3.6MW wind farm	0.65		
The Electric Power Sector Reform Programme (March 2002): the projects in north of Hebei (Wind Resource Area II)					
1	2005.11	Chengde Hongsong wind farm	0.6	Ji Jia Guan Zi [2006]57 issued by Price Bureau of Hebei province in Jun 2006	VER
2	2005.7	Guohua Shangyi Manjing wind farm	0.6		VER
3	2006.11	Hebei Shangyi Manjing East Wind Farm	0.6		Ref No.0842
4	2006.5	Zhangbei Manjing Wind Farm	0.6		Ref No.0233
5	2006.12	Zhangbei Mijiagou 49.5 MW Wind Farm	0.6		Ref No.0845
6	2006.1	Hebei Kangbao Wolongtushan 30 MW Wind farm	0.6		Ref No.0878
7	2007.8	Guyuan 30.6MW Wind farm	0.54	Fa Gai Jia Ge [2007]1260 issued by NDRC in Jun 2007	Ref No.0873
8	2005.11	Hebei Chengde Songshan Wind farm	0.54		Ref No.0877
9	2007.12	Hebei Chongli Qingsanying 49.3MW Wind Farm	0.54		Ref No.2140
10	after 2007.12.31	Hebei Shirensan Wind farm	0.54		Ref No.2067
11		Hebei Wanquan Yulong Wind farm	0.54		Ref No.2205
12		Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project	0.54		Ref No.2088
13	2007.10	Hebei Shangyi Manjing West Wind Farm	0.54	Fa Gai Jia Ge [2007]3303 issued by NDRC in Dec 2007	Ref No.2040
14	after 2007.12.31	Hebei Weichang Zhangjiawan Wind farm	0.54		under validation
15		Hebei Weichang Longyuan Construction	0.54		Ref No.2870

		Investment Shanwanzi Wind farm			
16	2007	Hebei Shangyi Qijiashan Wind Farm	0.5006	Fa Gai neng yuan [2008]1812 issued by NDRC in July 2008	Ref No.1854
17	2007	CECIC HKC Danjinghe Wind Farm	0.5006	Fa Gai neng yuan[2007]654 issued by NDRC in Jun 2007	Ref No.2170
18	2007	Hebei Chengde Yudaokou	0.551	NDRC/75/	Ref No.3467
19	2007.12	CECIC Zhangbei Dayangzhuang Wind Farm	0.54	Fa Gai Jia Ge [2008]1876 issued by NDRC in July 2008	Ref No.1855
20	after 2007.12.31	Hebei Chengde Huifeng	0.54	Ji Jia Guan [2009]69 issued by Price Bureau of Hebei province in Aug 2009 based on the Fagaijiage [2009]1906	Ref No. 1873
21		Hebei Chengde Fengze	0.54		Ref No. 1715
22		Hebei Chongli Qingsanying Phase II	0.54		under validation
23		Hebei Yuxian Kongzhongcaoyuan phase II	0.54		under validation
24		Hebei Kangbao Sanxiatian	0.54		under validation
25		Hebei Guyuan Wuhuaping	0.54		under validation
26		CECIC Zhangbei phase III	0.54		Ref No. 1895
27		Hebei Zhangbei Baimiaotan	0.54		under validation
28		Longyuan Shangyi Shirenfeng	0.54		under validation
29		Guohua Hebei Chicheng	0.54		under validation
30		Zhangbei Bode Longxiaoertai wind farm	0.54		applying CDM
31		Guohua Shangyi Manjing North	0.54		Ref No. 1792
32		Huarun Weichang Yudaokou	0.54		Ref No. 2865
33		Huarun Yueliangshan	0.54		Ref No 1464

34		Huarun Dongbaliang	0.54		Ref No 1423
35		Hebei Weichang Zhuzixia	0.54		under validation
36		Hebei Weichang Guangfayong	0.54		under validation
37		Hebei Dehe Zhangbei phase 1	0.54	Ji Jia Guan [2009]98 issued by Price Bureau of Hebei province in November 2009 according to the NDRC Fagaijiage [2009]1906/76/	under validation
38		Hebei Chengde Peifeng	0.54	Ji Jia Guan [2009]108 issued by Price Bureau of Hebei province in December 2009 according to the NDRC Fagaijiage [2009]1906	3079
39		Hebei Chengde Runfeng	0.54		under validation
The projects in south of Hebei (Wind Resource Area IV)*					
40	after 2007.12.31	Hebei Haixing 49.5MW Wind Farm	0.61	Fa Gai Jia Ge [2007]1260 issued by NDRC in Jun 2007	Ref No.2007
41		Huaneng Leting	0.61	Ji Jia Guan [2009]69 issued by Price Bureau of Hebei province In Aug 2009 based on the Fagaijiage [2009]1906	Ref No. 3160
42	after 2007.12.31	Guohua Huanghua phase I	0.61		Ref No. 2125
43		Guohua Huanghua phase II	0.61	Ji Jia Guan [2010] 4 issued by Price Bureau of Hebei province In Jan 2010 based on the Fagaijiage [2009]1906	Ref No.3021

As listed in Table 0-1, it is confirmed by DOE that a total of 43 wind power projects have been commissioned in Hebei Province or are currently under construction, some of their commissioning dates is not publicly available. However, the projects are listed in the timeline of tariff approval.

The validation team had identified five different tariffs as bellow:

Group 1: 0.65 RMB/kWh in No.1 & 2, only available prior to March 2002. Since the Notice of Electric Power Sector Reform Programme was issued by the State Council in March 2002, the tariff of 0.65 RMB/kWh is unavailable. The differences between the two early projects (No.1 &2) and the proposed project are:

1. The projects are demonstration (pilot) projects and therefore benefiting from government support through lower loan rate and higher tariff etc;
2. The capacities of the projects are 9.85MW and 3.6MW (lower than 15MW) ,much smaller than the 49.5MW of proposed project .

Group 2: 0.61RMB/kWh for four projects (40-43) are located in Wind Resource Area IV of Hebei province, which has a lesser wind resource, and therefore receives higher tariffs to compensate. As stated above the “Information on the policy of wind farm on-grid tariff” (Fa Gai Jia Ge 2009(1906)) clarified that the on-grid tariff of wind farm projects depends on the wind resource area where the wind farm project is located. Therefore, the tariffs awarded to the project in Wind Resource Area IV of Hebei are not comparable to the proposed project, which is not located in Wind Resource Area IV of Hebei.

Group 3: 0.5006RMB/kWh for two projects (16, 17) and 0.551 RMB/kWh for Hebei Chengde Yudaokou (18) are excluded in the tariff analysis of the proposed project.

CECIC HKC Danjinghe Wind Farm (No.17) and Hebei Shangyi Qijiashan Wind Farm(No 16) and Hebei Chengde Yudaokou wind farm (No.18) were large scale concession projects (more than 150MW). The tariff was determined via a tendering process/77/. Since the proposed project is not tendering project, thus the tariff of 0.5006RMB/kWh and 0.551 RMB/kWh are excluded in the tariff analysis of the proposed project.

Group 4: 0.60RMB/kWh for six projects (1-6) which is approved by Price Bureau of Hebei province in June 2006 and located in the wind resource area II (Chengde and Zhangjiakou).

Group 5: 0.54RMB/kWh for other projects including the proposed project is approved by NDRC from June 2007 and located in the wind resource area II (Chengde and Zhangjiakou). The tariff of 0.54RMB/kWh was maintained stable since 2007.

It can be concluded by the validation team that the highest approved tariffs for wind farm projects which are located in same wind resource area II in Hebei (Chengde city and Zhangjikou city regions) should be 0.60 RMB/kWh, which was awarded to the first six projects (No 1-6) implemented after the Power Sector Reform in 2002.

■ **Reference tariff calculated to demonstrate the additionality**

It is not possible for validation team to quantitatively assess the impact of the Chinese government's policy changes for the development of a domestic wind power industry due to no availability of data. The validation team has verified calculations as shown below to quantitatively demonstrate whether the net return to the investor has been reduced or not.

- 1) While the highest approved tariff of 0.60RMB/kWh used in the spread sheet of proposed project, the IRR is calculated as 7.57%, still below the benchmark.

2) While the highest approved tariff of 0.61RMB/kWh used for wind resources area IV of hebei province is applied for this proposed project, IRR is calculated as 7.83% which is also not crossing the benchmark.

3) While considered all the historical tariff in Hebei province, an reference tariff was calculated based on the financial data of the projects which was granted with high tariffs of 0.65 RMB/kWh

The reference tariff calculation method includes two steps:

Firstly, calculate a new IRR of the project, facing the same situation as the projects with the above stated highest tariffs by introducing the average financial data of the projects of higher tariffs (i.e. the tariff, the specific investment cost per kW, annual O&M cost per MWh,)

Secondly, to calculate a tariff in the spreadsheet of proposed project which makes the IRR reach the new calculated IRR.

The calculation of the reference tariff and the data used was listed in table below:

Table 0-2: the calculated reference tariff

The 0.65RMB/kWh, approved tariff of ealier two small pilot project		
	IRR	Reference tariff
using the financial data of investment /tariff	6.73%	0.567

Table 0-3: the financial data used in the calculation of reference tariff

CDM Ref No.	Project title	Approved tariff (RMB/kWh, incl VAT)	Investment costs (RMB/kW)	O&M costs (mRMB/MWh)
No CDM	Zhangbei Changcheng 9.85MW	0.65	11,261	N/A
No CDM	Chengde Hongsong phase I 3.6MW	0.65	12,342	N/A
	Average	0.65	11,802	N/A

Note: The investment cost per kWh for Zhangbei Changcheng wind project is calculated based on the wind project FSR approval from Hebei Planning Commission on 23 Nov.1995 and Power Ministry of China on 8 April 1997/57/.

The investment cost per kWh for Chengde Hongsong phase I wind project is calculated based on the wind project FSR approval from Hebei Development and Planning Commission on 13 Nov. 2000/58/.

All of the calculations above have been confirmed to feasible and results are correct.

While the reference tariff calculation using the two pre-2002 operated small scale demonstration projects which received a tariff of 0.65 RMB/kWh has also been carried out. The reference tariff on the basis of these two projects can be calculated as 0.567RMB/kWh. Thus the project is not economically attractive with this reference tariff because the project IRR is 6.73%, lower than the benchmark.

■ Conclusion

It is shown above that the relevant highest historical tariff for the proposed project activity is 0.60 RMB/kWh. Applying this tariff directly, the proposed project activity does not reach the benchmark 8% and therefore is additional.

If the higher tariffs awarded to the projects in the less-windy wind resource region IV in Hebei would be considered, the project would not reach the benchmark. Thus the project is also additional even if the higher tariff of 0.61RMB/kWh is used.

Furthermore If the higher tariffs awarded to two small scale demonstration projects in Hebei would be considered, then the reference tariff considering the similar circumstances to the projects with higher tariff is calculated at 0.567 RMB/kWh, the project would not reach the benchmark. Thus the project is also additional even if the higher tariff of 0.65RMB/kWh is used.

Therefore, the validation team can conclude that the tariff used in the FSR and PDD is appropriate and conservative and the incentives of investors have not been reduced due to the reduction in tariffs.

c) The assumptions for static investment cost of the project

The static total investment of PDD is taken as 494.65 million RMB which is in line with the data of FSR approved on 12 December 2007. The investment per MW of the proposed project is about 9.99 million RMB. It is felled in the reasonable range of 8-10 thousand RMB/kW in China, which is confirmed by checking the bulletin regarding china wind energy industry dialogue capital forum in 2009 dated 2 June 2009/45/ .

It is observed based on registered wind projects in Hebei province that the investment cost per installed capacity KW is well range from 7,640 RMB/kW to 12,935 RMB/kW for registered wind projects which are listed in the following table

Table-1 data for wind farm projects registered in Hebei province

Project name	Ref. No.	Installed capacity(MW)	Total static investment (10 ⁴ RMB)	Annual O&M (10 ⁴ RMB)	Operating hours	PLF	Investment per kW (RMB/kW)	O&M / Total static investment
Huaneng Weichang Yudaokou Phase I Wind Farm Project	4204	49.5	51712	1041	2187	0.250	10447	2.01 %
Hebei Fengning Dahexi Wind Power Project	4193	49.5	50503	732.9	2240	0.256	10203	1.45 %
Hebei Fengning Batou Wind Power Project	4182	48	46693	1155.5	2325	0.265	9728	2.47 %
CECIC Zhangbei Gaojialiang Wind farm Project	4095	49.5	43786	656	1900	0.217	8846	1.50 %
Hebei	4073	49.5	49142.6	1296	2334	0.266	9928	2.64

Chengde Runfeng Wind Farm Project								%
Dehe Zhangbei Phase I Wind Farm Project	4046	49.5	45164	1248	2205	0.252	9124	2.76 %
Hebei Weichang Guangfayong Wind power project	3758	49.5	40306	2011	2398	0.274	8143	4.99 %
CECIC HKE Zhangbei Lvnaobao Wind Power Project	3399	100.5	89079	2710	2405	0.275	8864	3.04 %
Hebei Chicheng Stage I Windfarm Project	3371	49.5	48661.46	1112.19	2230	0.255	9831	2.29 %
Guyuan Wuhuaping 49.5 MW Wind Power Project	3356	49.5	64029	799	2368	0.270	12935	1.25 %
Hebei Kangbao Sanxiatian Wind Farm Project	3312	49.5	63868	1196	2391	0.273	12903	1.87 %
Hebei Leting 49.5 MW Wind Farm Project Phase I	3160	49.5	55673.8	1039.35	2050	0.234	11247	1.87 %
Hebei Chengde Peifeng Wind Farm Project	3079	49.5	48955	1221	2335	0.267	9890	2.49 %
Guohua Hebei Huanghua (Phase II) 49.5MW Windfarm Project	3021	49.5	49906	1114.5	1956	0.223	10082	2.23 %
Hebei Weichang Longyuan Construction Investment Shanwanzi Wind Power Project	2870	49.5	53004	1450.1	2586	0.295	10708	2.74 %
Hebei Fengning Luotuogou 1st Phase Wind Power	2462	48	50618	1031	2236	0.255	10545	2.04 %

Project								
Hebei Wanquan Yulong Wind Power Project	2205	36	33664	809	2240	0.256	9351	2.40 %
CECIC HKC Danjinghe Wind Farm Project	2170	200	154740	4880	2193	0.250	7737	3.15 %
Hebei Chongli Qingsanying 49.3MW Wind Farm Project	2140	49.3	50956	1136	2293	0.262	10336	2.23 %
Guohua Hebei Huanghua 49.5 MW Wind Farm Project (Phase I)	2125	49.5	49193	1345.39	2003	0.229	9938	2.73 %
Hebei Yuxian Kongzhongc aoyuan 49.5MW Wind Farm Project	2088	49.5	53444	1075	2255	0.257	10797	2.01 %
Hebei Shirensan Wind Power Project	2067	49.5	49044	1276.3	2300	0.263	9908	2.60 %
Hebei Shangyi Manjing West Wind Farm Project	2040	49.5	45566.8	1243	2081	0.238	9205	2.73 %
Hebei Haixing 49.5MW Wind Farm Project	2007	49.5	54106	924	2323	0.265	10931	1.71 %
Hebei Chengde Huifeng Windfarm Project	1873	49.5	53452.5	1240	2159	0.246	10798	2.32 %
CECIC Zhangbei Dayangzhua ng Wind Farm Project	1855	49.5	37817	1382	1950	0.223	7640	3.65 %
Hebei Shangyi Qijiashan Wind Farm Project	1854	199.5	183778	3675	2316	0.264	9212	2.00 %
Hebei Chengde Fengze Wind Farm Project	1715	49.5	50300	1060	2405	0.275	10162	2.11 %

Yueliangshan 49.5MW Wind Power Project in Weichang County Hebei Province	1464	49.5	47404	1487	2257	0.258	9577	3.14 %
Dongbaliang 49.5MW Wind Power Project in Weichang County Hebei Province	1423	49.5	49004	1434	2265	0.259	9900	2.93 %
Hebei Kangbao Wolongtushan 30 MW Wind Farm Project	0878	30	27509	561.5	1932	0.220	9170	2.04 %
Hebei Chengde Songshan Wind Farm Project	0877	49.5	41100	1700	2081	0.238	8303	4.14 %
Guyuan 30.6MW Wind-farm Project	0873	30.6	32601	568.32	2178	0.249	10654	1.74 %
Zhangbei Mijiagou 49.5 MW Windfarm Project	0845	49.5	48142	1010	2137	0.244	9726	2.10 %
Hebei Shangyi Manjing East Wind Farm Project	0842	49.5	46866	2300	2360	0.269	9468	4.91 %
Zhangbei Manjing Windfarm Project	0233	45	N/A	N/A	2400	0.274	N/A	N/A

Since the investment cost per installed capacity of the proposed project is calculated to be 9990RMB/kW and it is well within the range of investment cost per installed capacity for wind farm projects in Hebei province, it is considered reasonable that investment cost of the proposed project is estimated to be 494.65 million RMB in the approved FSR/12/

d) The assumptions for electricity output

As stated above, it is expected to have a net annual power output of 112,170MWh at a plant load factor (PLF) of 25.86% (which is obtained by applying the operation hours divided by 8760 hours) which is derived from the FSR/12/.

As per the guidelines for the reporting and validation of plant load factors/48/, the plant load factor shall be ex-ante defined in the PDD according to one of three options including plant load factor provided to banker/financier for project financing or government for implementation approval, or determined by a third party contracted by the project participant.

Because the FSR is developed by China Fulin Wind Power Development Co., Ltd. contracted by Sinohydro Corporation Investment Co.,Ltd, the plant load factor can be considered to be determined

by an independent party contracted by the project participant. According to the EB requirements regarding determination of PLF/48/ it is considered to be credible and applicable for IRR calculation. It is confirmed by the validation team that the output value of PDD is consistent with that in the FSR. Based on the contracts/37/, the turbine and generators purchased actually are partly different from the FSR estimates of the turbine generators. However, it is confirmed based on the clarification by Hebei Electric Design & Research Institute in 2010 that the estimates based on the actual turbines is not more changed and about 0.78% of the annual generation estimates/51/. Even if the added power generation output is considered, the project IRR is 6.27%, which is not cross the benchmark. Thus the power output estimated to calculate of the project IRR for decision to proceed with the project implementation is considered to be appropriate.

Besides it is observed based on registered wind projects in Hebei province that the power load factor (PLF) is range from 0.217 to 0.295 for registered wind projects which are listed in the table-1 above. Since the PLF of the proposed project is calculated to be 0.2586 and it is well within the range of the PLF for wind farm projects registered in Hebei province, it is considered reasonable that power output of the proposed project is estimated to be 112,170MWh in the approved FSR/12/.

e) The assumptions for the O&M costs

The annual O&M costs mainly include maintenance costs, wage and welfare, material cost and other costs. The O&M cost of the project is confirmed to be about 2.40% of the total static investment and considered to be reasonable since it is less than the reasonable range of 5-8%/46/

The input parameters used in the financial analysis were also compared with the data reported for other similar CDM projects registered in Hebei Province through UNFCCC web, audit team compared the investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs and average load factor. In addition by applying our sectoral competence, the validation team was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

Thus, it was credible that the input parameters used in the financial analysis can be considered information provided by an independent and recognized source.

The FSR was approved on 12 December 2007/12/ and thus 8 months prior to the decision to proceed with the start date of the project which was on 13 August 2008. Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project.

The validation team was able to confirm available that the data used in the financial analysis are consistent with the approved feasibility study report /12/ and current tax regulation/32/ when the project activity was started/34/.

The validation team compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the value stated in FSR.

Besides it is observed based on registered wind projects in Hebei province that the average annual O&M cost ratio (annual O&M cost / static total investment) is range from 1.23 % to 4.99% for registered wind projects which are listed in the table-1 above. Since the PLF of the proposed project is calculated to be 2.40% and it is well within the range of the annual O&M cost ratio for wind farm projects registered in Hebei province, it is considered reasonable that the annual average O&M cost of the proposed project is estimated to be 11.88 million RMB in the approved FSR/12/.

3.5.3.4 Calculation and conclusion

The IRR calculations were provided in a spreadsheet. The calculations were verified and found to be correct by the validation team. The assumptions used in the calculations were deemed to be correct by

the validation team. The project-IRR without CDM revenues is 6.17%, which confirms that the project in the absence of CDM benefits and compared to the benchmark is not financially attractive. With CER revenues the project IRR increases to 9.98 %, which is above the benchmark./18/

3.4.6 Sensitivity analysis

A sensitivity analysis has been carried out for parameters contributing more than 20% to revenues or costs. Reasonable variations of the total investment, annual operational costs, and electricity output and on-grid tariff were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation. Moreover, the sensitivity analysis considering variations in the total investments, O&M costs, Annual supplied electricity and electricity sales demonstrates the following:

- Static total investments: If the static total investments decrease by 12.65%, the project IRR will reach the benchmark of 8%/18/. However, based on markup direction the price of production published on 10 March 2008 by National Statistical Bureau/28/, the validation team has ensured the average markup is about 4.5% every month from March 2007 to February 2008./28/. Also, the price of turbines had been increased continuously in recent years, audit team checked and confirmed the reference to wind power guild web dated 16 January 2008/28/.

Besides, by checking the main equipment contract for turbine and generator and tower and transformer it is respectively valued at 319.965 million, 48.175 million and 8.8 million RMB, totaling at 376.94 million RMB/36//37/. It is confirmed that the values of the contracts for the turbine and generator and tower and transformer is larger than the relevant values of FSR as 374.76million RMB/12/. Thus, the 12.65% decreased in the total investment is highly unlikely.

- Operation and maintenance (O&M) cost: Even if reducing the O&M cost by 69.5%/18/, the project IRR can be equal to the benchmark. So, the factor could be not sensitive to the proposed project. Besides, the prices of the requirement equipment and commodities can be confirmed to be having been increasing in recent years /47/. Generally it is impossible to reduce O&M cost so largely in the future.
- The electricity tariff used in IRR calculation of the proposed project is 0.54RMB/kWh (including VAT), sourcing from the approved FSR/12/. Reviewing the tariff in Hebei province in recent years, the tariff for connected grid of wind farm has been gradually decreasing, 0.984RMB/kWh of 2005 from study on Pricing of Wind Power in China by Shipengfei published in 2006; 0.650 & 0.600RMB/kWh of 2006 from the approval letter of Hebei Bureau of Price, No.,Jijiaguanzi 2006(57); 0.540 RMB/kWh in 9 June 2007 No.Fagainengyuan2007(1260) & in 3 December 2007 No.Fagainengyuan2007(3303) and 0.540 RMB/kWh of 2008 from NDRC on 26 July 2008 No.Fagainengyuan2008(1876) /28/, when the tariff was almost certain at the time of making the decision to go ahead with the project. The direction shows the on-grid tariff of the wind farm projects is gradually lowering down. Thus, it is unlikely that the electricity tariff will be increased by 13.8% to reach the benchmark IRR/18/.
- The power generation has been determined, by a third party design institute calculation , in the page 26 and page 65 to 69 of FSR/12/ based on the on-site wind data measurements from September of 2004 to August of 2005 and the historical wind data of year 1975 to 2004 from the local weather station, Estimation on electricity output to grid was calculated on energy loss estimation, which included air density, wind turbine efficiency, contamination of rotor blades, turbulent flow influence, transmission loss & auxiliary power use, correction on power curve, weather influence and others, and are carried out using professional WASP software (www.wasp.dk) and *Methodology of Wind Energy Resource Assessment for Wind Farm* (GB/T18710-2002)/33/ designed for wind energy, then, an average load factor of 25.86% has been applied. Feasibility Study Report of the project completed in December 2007 developed by Hebei Electric Design & Research Institute and the approval letter

by the Development and Reform Commission of Hebei province on 12 December 2007, Ref. No. Jifagainengyuanhezi 2007(145) /12/. Since the average wind speed of local weather station for late 30 years is 1.8m/s, the average speed for 20 years is 1.6 m/s and for late 10 years is 1.5m/s according to FSR/12/, the trend of wind speed is gradually lower. Hence, it is unlikely that the operation hours would be increased by 14.3% so as to reach the benchmark IRR./18/.

The sensitivity analysis shows that even with substantial variation of the key indicators, the IRR of the proposed project is lower than the benchmark.

The investment analysis and sensitivity analysis have shown that the proposed project is unlikely to be the most financially attractive option. The financial calculations and assumptions have been assessed by the validation team and are considered correct and conservative. The project IRR with CER revenues was estimated to be above the benchmark

In conclusion, the validation team checked the IRR calculations and the sources above referred and can confirm that the investment analysis and the sensitivity analysis shown that the project activity is unlikely to be the most financially attractive option.

3.5.4 Barrier analysis

The project did not use the step.

3.5.5 Common practice analysis

PP has chosen the projects which are considered to have similar capacity with the proposed project and be connected with NCPG in Hebei Province. In China, there are the similar wind resource, grid structure, geological and transportation conditions, economic developing status in a province. The validation team has verified the China's wind farm installed capacity statistics in 2007/25/ and China Wind Power development Report in 2006/25/ and the Program of Electric Power System Reformed/43/and China Electric Year Book 2007/15/, audit team can be able to consider available the period from 2002 to now and the province was as a benchmark for the common practice analysis.. Taking note of that the proposed project is a large scale project, the small scale projects less than 15MW are excluded. The validation team verified the Statistics of wind power installed capacity in China 2007/25/, it is found that one project named as Yuershan wind project has only 1.2MW which is excluded due to lower capacity than 15MW and only two wind farm plants (the Shangyi Manjing project and Chengde Hongsong project) except those seeking CDM benefits, having capacity of 34.5 MW and 53.7MW respectively, are in the same region (Hebei) and of similar scale (large scale) without CER income. Facing financial barriers due to lower approved tariff as 0.6RMB/kWh(VAT incl.)/39/ than estimated tariff in the FSRs of both projects/40//41/ respectively as 0.679 and 0.7RMB/kWh (VAT incl.), the Shangyi Manjing project and Chengde Hongsong project is operated with receiving voluntary carbon funding./42/ The audit team has verified the VER report and the bulletin regarding VCU implementation for both of them/42/ to ensure the two projects had enjoyed the financial support from voluntary carbon credits. All the other wind farms in Hebei Province have already successfully been registered or are applying for CDM projects. The validation team have verified the information on UFCCC web and confirmed.

In summary, based on the above mentioned arguments, it can be confirmed that the project activity in the absence of CDM revenues is not a common practice in the region. Hence, it is The validation team's opinion that the project is not a likely baseline scenario and that emission reductions occurring from this will hence be additional

3.6 Monitoring

The project applies the approved monitoring methodology, ACM0002/version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” /8/. Applicability criteria of the monitoring methodology are met by the project activity as noted in Section 3.4.1.

Leakage is not required to be considered and there is no project emission as per the methodology ACM0002/8/.

As confirmed with the project proponent during on-site audit and checking FSR/12/, no auxiliary fuels will be used in the project activity. This is verified by the audit team during the on-site inspection, and no project emission shall therefore be generated in accordance with ACM0002/Version 12.1.0.

The baseline emission factor for the project is fixed ex-ante as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) as described in ACM0002 /8/and the tool to calculate the emission factor for an electricity system/10/. Because plant specific fuel consumption and electricity generation data is not public available in China, DNV requested guidance from the CDM Executive Board for a deviation of the baseline methodology for AM0005 and received the following guidance/11/ which is deemed to also be applied to ACM0002.

Monitoring of sustainable development indicators is not required by the DNA of China. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project operation lifetime.

3.6.1 Parameters determined ex-ante

According to the approved monitoring methodology and deviation/8/&11/, The baseline emissions factor has been fixed for the first crediting period. In each year the amount of CERs actually generated by the project will depend on the electricity supplied by the project to the grid.

The parameters that have been determined ex-ante based on the most recent information available are the grid emission factors of the NCPG. The grid emission factor has been determined as per the methodology/8/, as the combined margin of the operating and the build margin in a 75:25 ratio as applicable for the wind projects. The parameters determined ex-ante are listed in below table:

<i>Data and Parameters</i>	<i>Unit</i>	<i>Value applied</i>	<i>Source of data used</i>
Operating margin of NCPG (OM)	tCO ₂ /MWh	1.0326	See section 3.4.4
Build Margin of NCPG (BM)	tCO ₂ /MWh	0.8690	See section 3.4.4
Emission factor of NCPG	tCO ₂ /MWh	0.99174	See section 3.4.4

3.6.2 Parameters monitored ex-post

In line with ACM0002 /8/, the net electricity supplied to the grid from the project activity will be calculated based on the electricity supplied by the project to the grid and imported from the grid which are continuously monitored and recorded monthly. The data will be cross verified against the billing receipts from the grid. All data collected as part of the monitoring are archived electronically and kept at least for 2 years after the end of the last crediting period. The data records will be kept by owner, who is responsible for the overall monitoring and reporting. During site visit period, it was found by

audit team that the main meter (M1) should be shared between the proposed project and other one wind farm, the two wind farms are belonged to the same owner; The summary of .proposed project monitoring plan as following:

- The net electricity supplied to the grid will be calculated by the electricity supplied by the proposed project to the grid monitored at M3, the electricity supplied by the third phase project to the grid measured at M4 and the electricity imported from the backup line measured at M5 and the electricity supplied to the grid measured at the main meter (M1), which is installed at the high voltage side of the 35/110kV transformer. These metering equipments except M5 have two-way metering function, recording both exports to the grid ($EG_{\text{export},y}$) and imports from the grid ($EG_{\text{import},y}$); net electricity supplied to the grid ($EG_{\text{facility},y}$) is calculated as exports minus imports. The results of $EG_{\text{export},y}$ and $EG_{\text{import},y}$ from the main meter will be supplied by the grid company to the project owner on a monthly by setting billing receipts of buy and sale.
- The backup meter (M2) is installed at the same point in parallel with M1. The main meter (M1) and backup meter (M2) are operated by the grid company. The main meter and the backup one are as like as two peas.
- The meter(M3) for the proposed project is installed at the substation of proposed project, it has two-way metering function, recording both exports to the main power line ($EG_{\text{export},y,3}$) and imports from the main power line ($EG_{\text{import},y,3}$). The results of $EG_{\text{export},y,3}$ and $EG_{\text{import},y,3}$ from the M3 will be recorded and archived by the project owner on a monthly.
- The meter(M4) for other wind farm is installed at the substation of other wind farm, it also has two-way metering function, recording both exports to the main power line ($EG_{\text{export},y,4}$) and imports from the main power line ($EG_{\text{import},y,4}$). The results of $EG_{\text{export},y,4}$ and $EG_{\text{import},y,4}$ from the M4 had been recorded and archived by the same owner on a monthly.
- The meter (M5) for the proposed project and other wind farm is installed for auxiliary power use by proposed project, it has metering function, recording imports from the main power line ($EG_{\text{backupline},y}$). The results of $EG_{\text{backupline},y}$ from the M5 meter will be supplied by the grid company to the project owner on a monthly by setting billing receipts of buy.
- Net electricity ($EG_{\text{facility},y}$) supplied to the grid by the proposed project is calculated on a monthly basis as:

$$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y} - EG_{\text{backupline},y}$$

Where:

$$EG_{\text{export},y} = EG_{\text{export},y,1} \times EG_{\text{export},y,3} / (EG_{\text{export},y,3} + EG_{\text{export},y,4});$$

Billing receipts from the grid company will serve as a cross-check.

$$EG_{\text{import},y} = EG_{\text{import},y,1} \times EG_{\text{import},y,3} / (EG_{\text{import},y,3} + EG_{\text{import},y,4});$$

Billing receipts from the grid company will serve as a cross-check for $EG_{\text{export},y}$ and $EG_{\text{import},y}$.

$EG_{\text{backupline},y}$, Electricity delivered to the project through the backup line

Billing receipts from the grid company will serve as a cross-check for $EG_{\text{backupline},y}$.

- The metering equipments (M1, M2, M3, M4, and M5) will be maintained by the third independent party designated by the government. The meters installed at the transmission lines connected to the turbines will be operated and maintained by owner. All metering equipments will be calibrated and checked annually by qualified third party/33/. The accuracy of the meters including M1, M2, M3 and M4 are not less than 0.5s and the accuracy of the meter M5 is not less than 1.0.
- The annual emission reduction of the proposed project during the first crediting period is :
 $ER_y = BE_y = EG_{\text{facility},y} * EF_y$

- The combined margin EF_y of $0.99174 \text{ tCO}_2/\text{MWh}$ is fixed *ex-ante* for the entire first crediting period. The electricity supplied to the grid of $EG_{\text{facility},y}$ from the project activity will be monitored *ex-post* and calculated by owner and cross-checked by the sale receipts. Finally, the billing receipts confirmed from the grid company will be as evidence for the emission reduction of the proposed project.

The readings of electricity meter will be hourly measured and monthly recorded. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup. The data will be kept by owner.

- The monitoring plan is established by the project proponent and checked by the audit team to be reasonably comprehensive. The monitoring procedure is transparently presented in B.7 of the PDD/2/.

3.6.3 Management system and quality assurance

The General Manager of Hebei Construction Investment Yuzhou Wind Energy Co., Ltd is responsible for the management of monitoring and reporting of the wind farm. The details about the responsibility of data monitoring, cross checking for QA/QC, calibration frequency, calibration standard are described in the following monitoring plan:

- Monitoring organization/2/
- Monitoring equipment and installation /2/&/12/
- Calibration and Maintenance/2/&/33/
- Data and records management system/2/
- Monitored data procedure/2/
- Quality control/2/
- Reporting and verification/2/

Detailed procedures have been developed and the implementation of these will enable subsequent verification of the project's emission reductions. The management team for monitoring of the project is identified in the PDD/2/. As reported by the project proponent, appropriate training shall be provided by the CDM consultant to the management team and operation team for ensuring they are suitable and competent for carrying out the work.

3.7 Sustainable Development

The letter of approval from the DNA of China had confirmed the project being in line with the sustainable development policies of host country/3/.

The project will, among others benefits, mitigate local environmental pollution caused by coal-fired power plants and create local employment opportunity./12/&/13/.

3.8 Environmental Impacts

An Environmental Impact Assessment (EIA) has been conducted according to Chinese law and regulation/13/. The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The Environmental Protection Bureau of Hebei Province approved the EIA on 27 September 2007 /13/. A detail description in PDD has been written by PP/2/.

- During validation period, audit team has checked and confirmed the documents. On site of proposed project, and also found the related vegetation destroyed had been re-planted and restituted based on the requirement of EIA.

3.9 Local Stakeholder Consultation

During November of 2007, the owner, who is Hebei Construction Investment Yuzhou Wind Energy Co., Ltd, carried out a survey of the local villagers and residents in the area. Guoshipen Villagers, Choushuipen Villagers and Chadao Villagers are identified as local stakeholders. In order to invite comments from local stakeholders, a bulletin was published by the project owner on the bulletin boards in Guoshipen Village, Choushuipen Village and Chadao Village around the proposed project, providing a detailed introduction of the proposed project, CDM, and the stakeholder meeting/50/.

The 80 questionnaires are received by the project owner and the survey had a 100% response/17/. The result of survey showed there were no adverse comments on the project activity.

During site interview, the 80 questionnaires were verified by the validation team.

The steps took to assess adequacy of the local stakeholders consultation are demonstrated as following:

- a. the EIA completed by the accredited entity and approval by the government/13/ are reviewed and found that no negative impact is occurred due to the project.
- b. the web information is searched and reviewed and no negative information regarding the project is found.
- c. it is found by means of on-site visit that no inhabitant is located in the project boundary so that no inhabitant is impacted due to the project.
- d. the validation team checked the local stakeholder invitation notification/50/ and questionnaires received/17/ and found that the consultation process is adequate and reasonable.

3.10 Comments by Parties, Stakeholders and NGOs

The PDD of 7 July 2008 was made publicly available on UNFCCC's website (<http://cdm.unfccc.int/Projects/Validation/DB/L0OZNE1FJPOR78IK0PV85N5LB6G9QA/view.html>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 13 November 2008 to 12 December 2008.

No comments were received.

Appendix A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CAR-1~~ OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CAR-2~~ ~~CL-3~~

Requirement	Reference	Conclusion
anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.		CL-5 OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-	CDM Modalities and Procedures	OK

Requirement	Reference	Conclusion
PDD format.	Appendix B, EB Decision	
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>						
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>						
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?		/1/	DR I	The project is located in Xiushuipeng Village, the southwest of Yuxian County, Zhangjiakou City of Hebei Province, P.R. China. The geography coordinates of the proposed project are to be clarified further and evidenced.	CL-1	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?		/1/	DR I	Yes. The project is a capacity addition from a renewable energy source and does not involve on-site fuel switch from fossil fuels to a renewable source. The power plant and North China Power Grid are defined as project system boundary.		OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>						
A.2.1. Which Parties and project participants are participating in the project?		/1/	DR	Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. is the project		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			participant from the Host Party (P.R.China). SWISS RE GLOBAL MARKETS LIMITED is the project participant from the Sponsor Party (Netherlands).		
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/	DR	No. The letters of approval from the DNAs of China and Netherlands have not been obtained.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	Yes. China ratified the Kyoto Protocol on 30 August 2002. Netherlands, the Annex I party, ratified the Kyoto Protocol on 31 May 2002. Both of them are voluntary participation. DNA of China is National Development and Reform Commission. DNA of Netherlands is Ministry of Housing, Spatial Planning and the Environment.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR I	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.		OK
A.3. Technology to be employed <i>Validation of project technology focuses on the project</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project design engineering reflects the current good practice in China.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I	The main equipments in the project are domestically produced and the project doesn't involve technology and installations from abroad.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes. The training will be provided by project owner and manufacturer before the proposed project will be put into operation.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	Not yet. The LoA from the DNA of China has not been issued.	CAR-1	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, as a renewable energy project, the project may substitute some coal fired power plant and produce positive environmental and economic benefits and contribute to the local sustainable development special on the alleviation of the power shortage in the local areas, and creating new job opportunities for the local people.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /8/	DR	Yes. The project applies ACM0002 (version 7) “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. The version of the methodology of ACM0002 is needed to be updated due to the expired	~~CL-2~~	OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	Yes. The project is a capacity addition from a renewable energy source and does not involve on-site fuel switch from fossil fuels to a renewable source. The geographic and system boundaries for the relevant electricity grid North China Power Grid can be clearly identified.		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/	DR	According to the methodology ACM0002,		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			for project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following: Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. Here, the grid is North China Power Grid.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	To a renewable energy project of wind power, no other alternative scenarios are required in the methodology ACM0002.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Yes		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /23/	DR	Yes		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes		OK
B.2.7. Have the major risks to the baseline been	/1/	DR	Yes		OK

[illegible]

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
				Step 4: Common practice analysis: It is to be clarified how to select the geography area as Hebei province and how to select the compared range for installed capacity.	CL-5	
B.3.2.	Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Ditto		OK
B.3.3.	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Ditto		OK
B.3.4.	If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /7/	DR	As per “Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)” version 07, please provide two timelines in Section B.5 of the PDD, with one indicating the Project implementation and the other indicating the efforts tried for applying the project as a CDM activity. And incentive from the CDM is to be clarified further accordingly.	CAR-2	OK
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>– where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /8/	DR	Project emission is regarded as zero as the project is a renewable energy (wind source) project.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Ditto		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Ditto		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The grid emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM). The calculation sheet about emission factors is to be provided and verified further.	CAR-3	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Ditto	CAR-3	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Ditto	CAR-3	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no leakages that need to be considered in applying this methodology.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Ditto		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Ditto		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	The emission reductions are measurable, and give long-term benefits. The project is estimated to reduce on an average of CO ₂ emissions of 111,243 during the crediting period.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	See B.10	~~CL-6~~	OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Yes.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	There is no project emission to be considered.		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Ditto		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	Ditto		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	Ditto		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on	/1/	DR	Ditto		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
how to deal with erroneous measurements?					
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR	Ditto		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR	Ditto		OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Ditto		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Ditto		OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	The project uses the <i>ex-ante</i> determination of emission factor for grid electricity. Only electricity supplied to the grid will be monitored. The relationship among the four parameters EGy, EG pj, EGs and EGc is to be clarified further.	CL-6	OK
B.10.2. Are the choices of baseline GHG indicators	/1/	DR	Ditto	CL-6	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
reasonable and conservative?					
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Ditto	CL-6	OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	Ditto	CL-6	OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Ditto	CL-6	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	Ditto	CL-6	OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/	DR	Yes.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Yes.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Yes		OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /8/	DR	Project participants do not need to consider leakage in applying this methodology.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	Ditto		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	Ditto		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /13/	DR	Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are identified in the EIA that was approved on 27 September 2007.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Chinese DNA, NDRC, does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored by local environmental authority.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host	/1/	DR	Ditto		OK

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
Country?						
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>						
B.13.1. Is the authority and responsibility of overall project management clearly described?		/1/	DR	Yes. The authority and responsibility of overall project management is clearly described.		OK
B.13.2. Are procedures identified for training of monitoring personnel?		/1/	DR	Yes		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?		/1/	DR	Being a wind power project, there will be no emergencies which will cause unintended emissions.		OK
B.13.4. Are procedures identified for review of reported results/data?		/1/	DR	Yes. An internal procedure on reading and reporting has been identified.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?		/1/	DR	Yes		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>						
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?		/1/	DR	The starting date of the project is defined as 13 August 2008, which is the earliest date of the project activity.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			The operational lifetime of the project is 20 years, as per the Feasibility Study Report.		
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	The expected start date of the crediting period is 1 June 2011, which is reasonable.		OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /13/	DR	Yes. The impacts are properly described.		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /13/	DR	The EIA has been approved by Local EPB on 27 September 2007.		OK
D.1.3. Will the project create any adverse environmental effects?	/1/ /13/	DR	There is no significant adverse environmental effect.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /13/	DR	There are no transboundary environmental impacts foreseen for the project.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes. The impacts are properly described in PDD.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/ /13/	DR I	Yes		OK

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>						
E.1.1. Have relevant stakeholders been consulted?		/1/ /17/	DR I	Yes. Local stakeholders were identified and invited. The summary of comments received is included in the PDD.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?		/1/	DR	The project owner carried out a survey conducted through distributing and collecting responses		OK
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/	DR	Yes		OK
E.1.4. Is a summary of the stakeholder comments received provided?		/1/ /17/	DR	Yes. The summary of the stakeholder comments received is described in the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?		/1/ /17/	DR	Yes.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 The letters of approval from the DNAs of China and Netherlands have not been obtained.	A.2.2 A.4.1	The LoAs from DNA of China and Netherlands have been provided.	The letter of approval issued by DNA of China is received and verified that it is issued in July 2008 and Hebei Yuxian Second Phase 49.5MW Wind Power Project complies with relevant requirements provided for CDM project in China and assists China in achieving sustainable development, otherwise, DNA of China authorizes Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. as China's participant to voluntarily participate in and carry out the project activity. The letter of approval issued by DNA of Netherlands (the Ministry of Housing, Spatial Planning and the Environment) is received and verified that it is issued on 16 December 2008 and Swiss Re Global Markets Limited is authorized as PP in the project. This CAR is closed.
CAR 2 As per "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)" version 7, please	B.3.4	About the two timelines: The timelines indicating the project implementation and the efforts tried for applying the project as a CDM activity have been included in Section B.5 of the	It is verified by checking the revised PDD and relevant evidences that: 1, the environment impact assessment table (EIA) is completed by the Institute of Hydrogeology and Environmental

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
provide two timelines in Section B.5 of the PDD, with one indicating the Project implementation and the other indicating the efforts tried for applying the project as a CDM activity. And incentive from the CDM is to be clarified further accordingly.		updated PDD. Furthermore, to demonstrate the prior consideration of the CDM following the guideline (Annex 46 of the EB41 meeting report), the project participant has received the Notification Form issued by the DNA of China on 2nd Oct 2008. The Notification Form will be submitted to DOE with the updated PDD for assessment. About the incentive from the CDM: Based on the officially approved FSR, without income from selling CERs, the project IRR of the proposed project is 6.17%, lower than the benchmark IRR 8% and the proposed project is financially unacceptable because of its low profitability. While considering such income, the IRR of the proposed project is 10.29%, better than the benchmark, and then the proposed project is financially acceptable. Further more the approved FSR was the base for investment decision. So, the income from selling CERs was seriously considered in the decision to proceed with the proposed project activity. More details can be seen from the Section B.5 of the updated PDD.	Geology,CAGS on 6 August 2007. 2, the Grid Access Approval for the proposed project is issued by Hebei Grid Co. on 27 August 2007. 3, the approval of EIA of the proposed project is issued by Hebei Environment Protection Bureau on 27 September 2007. 4, the local stakeholders responses to the proposed project are completed during November to December 2007. 5, the feasibility study report (FSR) of the proposed project is completed by Hebei Electric Power Design and Research Institute in December 2007. 6, the approval of FSR of the proposed project is issued by Hebei Development and Reform Commission on 12 December 2007. 7, the emission reduction purchasing agreement (ERPA) is signed by the project owner with Swiss Re Global Market Limited on 28 March 2008. 8, the LoA of China is issued on 14 August 2008. 9, the construction contract for civil work and installation of the proposed project is signed on 13 August 2008. 10, the starting construction order is

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			issued by the construction supervising company on 15 August 2008. 11, the equipment purchasing agreement for 33 sets of wind power turbine and generator is signed on 27 August 2008 12, the notification informing the DNA of China regarding the proposed project implementation submitted by the project owner is confirmed by NDRC on 2 October 2008 13, the LoA of Netherlands is issued on 16 December 2008. By verifying the evidences referred in the PDD for the proposed project activity, we can confirm that the earliest date the project owner as project participant commit to expenditure related to the implementation of the project construction is date when the construction contract is signed, i.e. the starting date of the proposed project is 13 August 2008. It is confirmed that the incentive from CDM is seriously considered in the decision to proceed with the proposed project activity by checking the evidences as following:

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			Since the project IRR of the proposed project is 5.25% according to FSR completed in December 2007, by comparing with the benchmark of 8% commonly used for wind farm construction in China, it is apparently low profitable and less attractive. Thus the designing institute suggests in the FSR that the project owner should seek the support of CDM to offset the less financial attractive of the proposed project for the sake of good social and environmental profits.. The project participant has submitted the notification of the proposed project as CDM project on 2 September 2008 to DNA of China by who it is confirmed on 2 October 2008, which date is less than 6 months comparing the starting date of the proposed project (13 August 2008). Thus it is in line with EB41 requirements regarding prior CDM consideration of new project starting on or after 2 August 2008. Otherwise, ERPA is signed on 28 March 2008 and LoAs of both Parties have been issued respectively in July 2008 for China and 16 December 2008 for Netherlands

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			This CAR is closed.
CAR 3 The grid emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM). The calculation sheet about emission factors is to be provided and verified further.	B.5	The calculation sheet about emission factors has been provided.	The emission reduction spreadsheet is received and verified that the OM is 1.0326tCO₂/MWh and BM is 0.8690 tCO₂/MWh for NCPG by comparing relevant data from the China DNA published on 18 July 2008. This CAR is closed
CL 1 The geography coordinates of the proposed project are to be clarified further and evidenced.	A.1.1	The central geographical coordinates of the project are 114°32'2"E and 39°35'1"N which is sourced from the approved FSR.	It is to be confirmed by checking FSR/12/. This CL is closed
CL 2 The version of the methodology of ACM0002 is needed to be updated due to the expired	B1.1	The version 3.2 of PDD is updated according to the version 12.1.0 of the methodology of ACM0002.	It is verified that the PDD is revised according to the version 12.1.0 of ACM0002. This CL is closed.
CL 3 It is to be clarified and evidenced further how to determine the tariff, the annual operational hours, the total investment and the annual O&M Cost.	B.3.1	All input values (including the tariff, the annual operational hours, the total investment and the annual O&M Cost) in the investment analysis in PDD are taken from the Approved FSR. The FSR completed by Hebei Electric Power Design & Research Institute (with high qualification) was approved by local	A feasibility study report (FSR) in China is required to be developed by a third party accredited for this task directly by the government. An approval letter of the Feasibility Study is issued by the government only after it passes the public assessment of the sector experts designated by the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		DRC on 12th December, 2007, about a half year prior to the starting date (13th August, 2008 when the Construction Contract were signed). Therefore the input values from the FSR have not materially changed in the period between the approval of the FSR and the investment decision. Among all the four values are further clarified as follows: 1) the tariff The tariff in the investment analysis in PDD is 0.54 RMB/kWh (incl. VAT) which is taken from the approved FSR. The tariff of the other approved wind power projects in Hebei province is also 0.54 RMB/kWh (refer to Approval letter to wind power projects regarding bus-bar tariff. NDRC Price [2007]3303; Approval letter to wind power projects regarding bus-bar tariff. NDRC Price [2008]1876). At present, the wind power tariff in China shows steady-going trend. Therefore, the tariff of the project in PDD can be considered as	government. A feasibility study report can in the validation team's opinion thus be regarded as an accurate and trustworthy report coming from a recognized entity. Considering the all data taken from the approved feasibility study report /12/, the IRR of the proposed project activity without CDM revenues accounts to 6.17%/18/, which indicates that the project is not economically attractive compared with the benchmark IRR. In line with the paragraph 54 of the EB38 report, TUV Rheiland confirms that: All the data and parameters used for the financial analysis have been sourced from the feasibility study report (FSR) completed in December 2007/12/, developed by Hebei Electric Design & Research Institute and approval letter by the Development and Reform Commission of Hebei province on 12 December 2007 /12/. Further, the tax and debt used by IRR calculation had been cross-checked

¹ Validation report of the HEBEI SHIRENSHAN WIND POWER PROJECT which was Registered on 29th .Dec 08 as a CDM project

² Renewable Energy-Technology, Economics and Environment, page 342,2007

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		plausible and conservative. 2) the annual operational hours The operational hours are 2266 hours per year which is sourced from the Approved FSR. In the FSR, the institute calculated the value based on the on-site wind data measurements from September of 2004 to August of 2005 and the historical wind resources measurements between 1975 and 2004 measured by Laiyuan Meteorological Station. Therefore, the operational hours of the project in PDD are realistic and plausible. 3) the static total investment The static total investment used in the investment analysis in PDD is 494.65 million RMB which is completed the investment calculation of the project by Hebei Electric Power Design & Research Institute. The investment per MW was calculated at about 9.99 million RMB/MW, which is similar compared to the typical average observed (i.e. about 10 Mio RMB/MW)¹. So, the investment can be considered as realistic and credible.	during validation period. The City Build tax, Education tax, Value-add tax rate, Residual rate and Revenue tax rate are from revelation Chinese regulation/32/. Otherwise, the tariff used in FSR also was verified during validation period. The validation team had checked and confirmed the other approved wind power projects in Hebei province from 2007 to 2008 was also 0.54 RMB/kWh (Inc. VAT)/38/, So, it is considered available by the validation team that 0.54 RMB/kWh(Inc. VAT) was selected in FSR. The annual operation hours as key parameter of power generation has been determined by a third independent party, by checking the page 26 and page 65 to 69 of FSR/12/, based on the on-site wind data measurements from September of 2004 to August of 2005 and the historical wind data of year 1975 to 2004 from the local weather station, Estimation on electricity output to grid was calculated on energy loss estimation, which included air density, wind turbine efficiency, contamination of rotor blades, turbulent flow influence, transmission loss & auxiliary

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		4) the annual O&M Cost The annual O&M costs mainly include maintenance costs, wage and welfare, material cost and miscellaneous costs. The O&M costs are about 2.32% of the total investment which is lower than the normal range (from 5%-8%)². So, the annual O&M costs can be considered as realistic and plausible. In conclusion, all the input parameters including the above four parameters in the PDD are the same as the approved FSR's so the input parameters are credible and appropriate. The evidences for the input parameters are documented and have been submitted to DOE for assessment and cross-check.	power use, correction on power curve, weather influence and others, and are carried out using professional WASP software (www.wasp.dk) and <i>Methodology of Wind Energy Resource Assessment for Wind Farm</i> (GB/T18710-2002)/33/ designed for wind energy, then, an average load factor of 25.9% i.e. 2266 hours per year has been applied. The static total investment of PDD is taken as 494.65 million RMB which is in line with the data of FSR approved on 12 December 2007. The investment per MW of the proposed project is about 9.99 million RMB. It is felled in the reasonable range of 8-10 thousand RMB/kW in China, which is confirmed by checking the bulletin regarding china wind energy industry dialogue capital forum in 2009 dated 2 June 2009/45/. The annual O&M costs mainly include maintenance costs, wage and welfare, material cost and other costs. The O&M cost of the project is confirmed to be about 2.32% of the total investment and considered to be reasonable since it is less than the reasonable range of 5-8%./46/

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			The input parameters used in the financial analysis were also compared with the data reported for other similar CDM projects registered in Hebei Province through UNFCCC web; audit team compared the investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs and average load factor. In addition by applying our sectoral competence, the validation team was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project. Thus, it was credible that the input parameters used in the financial analysis can be considered information provided by an independent and recognized source. The FSR was approved on 12 December 2007/12/ and thus 8 months prior to the decision to proceed with the start date of the project which was on 13 August 2008. Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values would

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			have materially changed and that it is thus reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project. The validation team was able to confirm available that the data used in the financial analysis are consistent with the approved feasibility study report /12/ and current tax regulation/32/ when the project activity was started/34/. The validation team compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the value stated in FSR. This CL is closed
CL 4 It is to be clarified further why the IRR value of PDD is different from the IRR of FSR.	B.3.1	When calculating the income tax, the loan interest has been taken into account. Furthermore, this is in accordance with conservative principle.	It is verified that the IRR of PDD for GSP/1/ does not consider the loan interests when calculating the total cost. But it is revised in the update PDD/2/. This CL is closed
CL 5 Step 4: Common practice analysis:	B.3.1	In China, most policies including financial, tax and price aspects are	PP has chosen the projects which are considered to have similar capacity with

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
It is to be clarified how to select the geography area as Hebei province and how to select the compared range for installed capacity.		promulgated in provincial level by combining the national policy with the region's concrete condition. In addition, the wind power project was implemented under the administration of provincial level government. The activities in the same province have the similar wind resource, grid structure, geological and transportation conditions, economic developing status etc. (Seen in China Wind Power Industry Development Report (2006), Shi Peng Fei, China Electric Year Book 2007). Therefore, the site of similar activities is identified in Hebei province. And this is is widely used in China. The project under 15MW is considered small-scale project and the project with the installed capacity not less than 50MW must be gotten the approval letter from NDRC. So, in accordance with the conservative principle, the projects with installed capacity between 15 MW and 100 MW will be identified for analyzing common practice.	the proposed project and be connected with NCPG in Hebei Province. In China, there are the similar wind resource, grid structure, geological and transportation conditions, economic developing status in a province, which is by the validation team verifying China Wind Power development Report in 2006/25/ and the Program of Electric Power System Reformed/43/and China Electric Year Book 2007/15/, audit team can be able to consider reasonable and credible the period from 2002 to now and the province was as a benchmark for the common practice analysis.. Taking note of that the proposed project is a large scale project, the small scale projects less than 15MW are excluded and the projects with installed capacity between 15MW and 100MW are selected for common practice analysis. This CL is closed
CL 6	B.10	The relationship among the parameters	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
The project uses the <i>ex-ante</i> determination of emission factor for grid electricity. Only electricity supplied to the grid will be monitored. The relationship among the four parameters EG_y, EG_{pj}, EG_s and EG_c is to be clarified further.		has been clarified further and the Figure 4 has been updated accordingly.	• The net electricity supplied to the grid will be calculated by the electricity supplied by the proposed project to the grid monitored at M3, the electricity supplied by the third phase project to the grid measured at M4 and the electricity imported from the backup line measured at M5 and the electricity supplied to the grid measured at the main meter (M1), which is installed at the high voltage side of the 35/110 transformer. These metering equipments have two-way metering function, recording both exports to the grid (EG_{export,y}) and imports from the grid (EG_{import,y}); net electricity supplied to the grid (EG_{facility,y}) is calculated as exports minus imports. The results of EG_{export,y} and EG_{import,y} from the main meter will be supplied by the grid company to the project owner on a monthly by setting billing receipts of buy and sale. • The backup meter (M2) is installed at the same point in parallel with M1. The main meter (M1) and backup meter (M2) are operated by the grid company. The main meter and the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			backup one are as like as two peas. • The meter(M3) for the proposed project is installed at the substation of proposed project, it has two-way metering function, recording both exports to the main power line ($EG_{\text{export},y,3}$) and imports from the main power line ($EG_{\text{import},y,3}$). The results of $EG_{\text{export},y,3}$ and $EG_{\text{import},y,3}$ from the M3 will be recorded and archived by the project owner on a monthly • The meter(M4) for other wind farm is installed at the substation of other wind farm, it also has two-way metering function, recording both exports to the main power line ($EG_{\text{export},y,4}$) and imports from the main power line ($EG_{\text{import},y,4}$). The results of $EG_{\text{export},y,4}$ and $EG_{\text{import},y,4}$ from the M4 had been recorded and archived by the same owner on a monthly. • The meter (M5) for the proposed project and other wind farm is installed for auxiliary power use by proposed project, it has metering function, recording imports from the main power line ($EG_{\text{backupline},y}$). The

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			results of $EG_{\text{backupline},y}$ from the M5 meter will be supplied by the grid company to the project owner on a monthly by setting billing receipts of buy and sale. • Net electricity ($EG_{\text{facility},y}$) supplied to the grid by the proposed project is calculated on a monthly basis as: $EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y} - EG_{\text{backupline},y}$ Where: $EG_{\text{export},y} = EG_{\text{export},y,1} \times EG_{\text{export},y,3} / (EG_{\text{export},y,3} + EG_{\text{export},y,4});$ Billing receipts from the grid company will serve as a cross-check. $EG_{\text{import},y} = EG_{\text{import},y,1} \times EG_{\text{import},y,3} / (EG_{\text{import},y,3} + EG_{\text{import},y,4});$ Billing receipts from the grid company will serve as a cross-check. $EG_{\text{backupline},y}$ Billing receipts from the grid company will serve as a cross-check. • The metering equipments (M1, M2, M3, M4, and M5) will be maintained by the third independent party

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			designated by the government. The meters installed at the transmission lines connected to the turbines will be operated and maintained by owner. All metering equipments will be calibrated and checked annually by qualified third party/33/. The accuracy of the meters including M1, M2, M3 and M4 are not less than 0.5s and the accuracy of the meter M5 is not less than 1.0. The annual emission reduction of the proposed project during the first crediting period is : $ER_y = BE_y = EG_{facility,y} * EF_y, \text{ years}$ This CL is closed

Appendix B

CERTIFICATES OF COMPETENCE

Qualification

Ma, Jiandong /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:

(Zugelassen)

☒ ja

Qualification Level:

(Qualifikationsstufe)

Auditor

External:

(Externer)

☐ ja

Add. reviewer:

(Zusätzlicher Prüfer)

☐ yes

EAC Scopes:

(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)

CDM 04 - Manufacturing industries

Add. qualification:

(zus. Qualifikation)

First Appointment:

(Erstberufung)

2009/07/07

Valid to:

(Gültig bis)

2012/07/06

Remarks:

CDM 01: valid for TA 1.1, 1.2

CDM 04: valid for TA 4.5 - Other WHR and Fuel Switch

Languages:

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:

(letzte Beurteilung)

Next Monitoring:

(nächste Beurteilung)

Remarks:

[View / Edit Monitoring](#)

History of scope allocation

Date: 2009-07-07
Change: EAC CDM added
By: Manfred Brinkmann
Reason: Role as team leader for DNV confirmed for:
- China tumuxi small hydropower project
- Fujian jinjiang LNG power generation project
Other validation reports are either not (yet) available or show different role (GHG auditor: Henan sanmenxia, Lufeng;
Trainee: Heilongjiang Hengdaishan).
Explanation for inconsistent information requested 2009-07-07.
M. Brinkmann

History

Created:	2009/06/15 14:39:04 ZE8	Jiandong Ma/Shg/Chn/TUV
Modified:	2011/01/13 15:31:21	Manfred Brinkmann/Jpn/TUV
	2011/01/13 15:31:13	Manfred Brinkmann/Jpn/TUV
	2011/01/13 15:31:00	Manfred Brinkmann/Jpn/TUV
	2011/01/13 15:29:02	Manfred Brinkmann/Jpn/TUV
	2011/01/10 20:21:19 ZE8	Jiandong Ma/Shg/Chn/TUV
	2009/10/23 22:23:33	Manfred Brinkmann/Jpn/TUV

Qualification

A, Qingxing (Sequoia) /

Emission Trading United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed:
(Zugelassen)

☒ ja

Qualification Level:
(Qualifikationsstufe)

Lead Auditor

External:
(Externer)

☐ ja

Add. reviewer:
(Zusätzlicher Prüfer)

☐ yes

EAC Scopes:
(EAC Branchen)

CDM 01 – Energy industries (renewable – / non-renewable sources)

Add. qualification:
(zus. Qualifikation)

First Appointment:
(Erstberufung)

2008/05/20

Valid to:
(Gültig bis)

2011/05/19

Remarks:

CDM 01 valid for TA1.2 – Renewable Energies

Languages:

Chinese
English

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

[View / Edit Monitoring](#)

History of scope allocation

Date: 2008-05-20
Change: EAC CDM, CDM added
By: Manfred Brinkmann
Reason:

History

Created: 2008/05/19 17:35:31 ZE8
Modified: 2011/01/25 22:52:07

Sequoia A/Shg/Chn/TUV
Manfred Brinkmann/Jpn/TUV

2010/12/19 14:23:04
2010/12/19 14:21:19
2010/12/19 14:19:54
2010/12/19 14:19:18
2010/09/13 16:07:36

Manfred Brinkmann/Jpn/TUV
Manfred Brinkmann/Jpn/TUV
Manfred Brinkmann/Jpn/TUV
Manfred Brinkmann/Jpn/TUV
Manfred Brinkmann/Jpn/TUV

Qualification

Chan, Wilfred /

Emission Trading United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed:
(Zugelassen)

☒ ja

Qualification Level: Auditor
(Qualifikationsstufe)

External:
(Externer)

☐ ja

Add. reviewer:
(Zusätzlicher Prüfer)

☐ yes

EAC Scopes:
(EAC Branchen)

CDM 06 – Construction
CDM 13 – Waste handling and disposal
CDM 01 – Energy industries (renewable – / non-renewable sources)

Add. qualification:
(zus. Qualifikation)

First Appointment:
(Erstberufung)

2008/03/25

Valid to:
(Gültig bis)

2011/03/24

Remarks:

2008-08-03:
Addition of CDM-01 based on project experience, but limited to renewable energies except Biomass power / cogeneration projects.

Languages:

Chinese
Chinese simplified
Chinese traditional
English
Mandarin

Experience Exchange

Date

Location

Remarks

Accredita

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next
Monitoring:
(nächste
Beurteilung)

Remarks:

[View](#) / [Edit Monitoring](#)

History of scope allocation

Date:
Change:
By:
Reason:

Date: 2007-06-24
Change: EAC CDM, CDM added
By: Manfred Brinkmann
Reason: No indication yet for training as CDM auditor and participation in completed validation / verification activities, therefore changed application to 'Expert'.

History

Created: 2007/05/23 14:58:07 Wilfred Chan/Hk/Chn/TUV
Modified: 2008/08/03 11:37:43 Manfred Brinkmann/Jpn/TUV

Qualification

Brinkmann, Manfred /

Emission Trading United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed:
(Zugelassen)

☒ ja

Qualification Level:
(Qualifikationsstufe)

Lead Auditor

External:
(Externer)

☐ ja

Add. reviewer:
(Zusätzlicher Prüfer)

☒ yes

EAC Scopes:
(EAC Branchen)

CDM 05 – Chemical industry
CDM 11 – Fugitive emissions from production and consumption of
halocarbons and sulphur hexafluoride
CDM 12 – Solvents use
CDM 01 – Energy industries (renewable – / non-renewable sources)
CDM 13 – Waste handling and disposal

Add. qualification:
(zus. Qualifikation)

First Appointment:
(Erstberufung)

2004/03/03

Valid to:
(Gültig bis)

2013/03/03

Remarks:

Valid for TA 1.2, 5.1/11.1/12.1, 13.1

Languages:

German
English
French

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

[View / Edit Monitoring](#)

History of scope allocation

Date: 2004-03-05
Change: EAC CDM, CDM added
By: Klaus-Dieter Fritsch
Reason:

Date: 2004-03-03
Change: EAC CDM, CDM, CDM, CDM, CDM, CDM added
By: Klaus-Dieter Fritsch
Reason: Qualification is based on the applicant's ISO 14001 auditor qualification.

History

Created:	2003/12/11 14:27:13	—
Modified:	2011/01/30 19:48:52	Manfred Brinkmann/Jpn/TUV
	2011/01/30 19:48:07	Manfred Brinkmann/Jpn/TUV
	2010/04/02 11:36:57	Manfred Brinkmann/Jpn/TUV