# HEBEI GUYUAN COUNTY DONGXINYING 199.5 MW WIND POWER PROJECT IN CHINA

REPORT NO. 01 997 9105049838

REVISION NO. 04.3, 2011-09-08

## I. Project description:

**Project title:** Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project

**Host Country:** China

**Methodology:** ACM0002 version 12.1.0 ☒ Large Scale ☐ Small Scale

**Annual average emission reductions (estimate):** 427,936 tCO2e/yr

**GHG reducing measure/technology:**
Clean and renewable wind energy is utilized in the project for power generation, which displaces electricity from the grid, and has a total installed capacity of 199.5MW.

| Party | Project Participants | Party considered a project participant |
|---|---|---|
| P.R. China (host) | Hebei Construction Investment New Energy Co., Ltd. | No |
| The United Kingdom of Great Britain and Northern Ireland | Shell Trading International Limited.(UK) | No |

## II. Validation:

**Contract party:** Hebei Construction Investment New Energy Co., Ltd.

**Validation Team:**

| Role | Full name | Appointed for Sectoral Scopes | Affiliation |
|---|---|---|---|
| **Team Leader** | Jiandong Ma | 1.1,1.2,4.5 | TÜV Rheinland Shanghai Ltd. |
| **Team member** | Sequoia A | 1,4 | TÜV Rheinland Shanghai Ltd. |
| **Technical Reviewer** | Zhou Kai | 1.5 | TÜV Rheinland Guangzhou Ltd. |
| **Technical Reviewer** | Cuiping Deng[1] | 1.2, 5.1, 11.1, 12.1 | TÜV Rheinland (China) Co., 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.: | Current revision No.: | Date of current revision: | Date of first issue: |
|---|---|---|---|
| 01 997 9105049838 | 04.3 | **2011-09-08** | **2009-05-05** |

Distribution:
☒ No distribution without permission from the Client or responsible organizational unit ☐ Unrestricted distribution

| Final approval: | Released on: | Designated Operational Entity (DOE): |
|---|---|---|
| ☒ | **2011-09-15**<br>By: Dr. M. Brinkmann | **TÜV Rheinland Japan Ltd.**<br>Shin Yokohama Daini Center Bldg.,<br>3-19-5, Shin Yokohama Kohoku-ku,<br>Yokohama, JAPAN 222-0033<br>Tel.: +81 45 470 1850, Fax: +81 45 470-2361<br>E-mail: cdm@tuv.com |

1 TR was transferred to Ms Deng Cuiping on 6 April 2011.

## Executive Summary – Validation Opinion

*The validation team assigned by the TÜV Rheinland Japan Ltd. concludes that the CDM Project Activity "Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project" in China, as described in the PDD (version 6.0, 07/09/2011), 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, 5th Sept. 2008)*
*- Public stakeholder comment process (13th Nov. 2008 to 12th Dec. 2008)*
*- On-site visit with stakeholder interviews (22nd Dec. 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 6.0, 7th Sept. 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 the United Kingdom of Great Britain and Northern Ireland. Both Parties fulfill 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" and tools referred therein/9//10//11/.*
*The tool to calculate project or leakage $CO_2$ emission from fossil fuel combustion/41/ is excluded due to no fossil fuel combustion in the project site based on confirmation from the project participants and the PDD/FSR/13/. The combined tool to identify the baseline scenario and demonstrate additionality/42/ is excluded since the proposed project is a new built grid-connected renewable power project.*
*By generating renewable energy from wind power plant, the project will displace fossil fuel based grid electricity. The project results in reductions of $CO_2$ 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 and tools referred therein are applicable to the project and correctly applied, except the tool to calculate project or leakage CO2 emission from fossil fuel combustion and the combined tool to identify the baseline scenario and demonstrate additionality.*

*The total emission reductions from the Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project are estimated to be on an average 427,936 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 operation of the proposed project.*

*In summary, it is the validation team's opinion based on explicit validation process described below that the "Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project" in China as described in the PDD version 6.0 of 7 Sept. 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. TÜV Rheinland 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* |
| *CO2* | *Carbon dioxide* |
| *CO2e* | *Carbon dioxide equivalent* |
| *DNA* | *Designated National Authority* |
| *DRC* | *Development and Reform Commission* |
| *EB* | *Executive Board* |
| *EIA* | *Environmental Impact Assessment* |
| *ERPA* | *Emission Reduction Purchase Agreement* |
| *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 Organization* |
| *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* |
| *SCE* | *Standard coal equivalent* |
| *UK* | *United Kingdom* |
| *UNFCCC* | *United Nations Framework Convention on Climate Change* |
| *VAT* | *Value-added Tax* |

# TABLE OF CONTENTS


1 Introduction ..... 4
1.1 Objective 4
1.2 Scope 4

2 Methodology ..... 5
2.1 Desk Review of the Project Design Documentation 5
2.2 Follow-up Interviews with Project Stakeholders 8
2.3 Resolution of Outstanding Issues 8
2.4 Internal Quality Control 10
2.5 Validation Team 10

3 validation Findings ..... 11
3.1 Approval and Participation 11
3.2 Project Design Document 12
3.3 Project Description 12
3.4 Baseline and Monitoring Methodology 13
3.5 Additionality 18
3.6 Monitoring 40
3.7 Sustainable Development 42
3.8 Environmental Impacts 42
3.9 Comments by Local Stakeholders 43
3.10 Comments by Parties, Stakeholders and NGOs 43

Appendix A: Validation Protocol
Appendix B: Certificates of Competence

# 1 INTRODUCTION

Hebei Construction Investment New Energy Co., Ltd. has commissioned the DOE TÜV Rheinland Japan Ltd. to perform a validation of the project called as Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project in China (hereafter called “the project”). This report summarizes 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. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures 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/6/, 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 follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report as well as 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/ Ms ZHU Qingrong and Ms JIA Hui, Project Design Document for Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project, Version 2.0, 5 September 2008

/2/ Ms ZHU Qingrong and Ms JIA Hui, Project Design Document for Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project, Version 6.0, 7 Sept. 2011

/3/ Letter of Approval is issued by DNA of China in November 2008, Ref. No. 1566

/4/ Letter of Approval is issued by DNA of the United Kingdom of Great Britain and Northern Ireland on 20 April 2010, Ref.No. STIL/03/2010

/5/ Modalities of Communication: 3 December 2009

/6/ CDM Validation and Verification Manual (Version 1.2)
http://cdm.unfccc.int/Reference/Manuals/index.html

/7/ As applicable:
CDM-PDD - Project Design Document form, Version 03
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/ The statistics of installed capacity of wind power in China 2007,
http://www.cwea.org.cn/download/display_info.asp?cid=&sid=&id=19

/9/ ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources”, version 12.1.0

/10/ 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

/11/ AM_Tool_07 “Tool to calculate the emission factor for an electricity system” Version 02
http://cdm.unfccc.int/Reference/tools/index.html

/12/ CDM EB, Answer to DNV’s request for deviation of Chinese project activities from
AM0005, received on 1 December 2005.
To be found on http://cdm.unfccc.int/Projects/Deviations

/13/ Feasibility Study Report of the project completed in January 2008 developed by North China Power Engineering (Beijing) Co., Ltd. and the approval letter issued by National Development and Reform Commission of China on 4 June 2008, Ref. No.fagainengyuan 2008(1325)

/14/ Hebei Institute of Geographical Sciences,, Environmental Impact Assessment of the project on 30 October 2007, and the approval letter by Hebei Province Environment Protection Bureau on 19 November 2007, Ref. No. Jihuanbiao 2007(342)

/15/ Project IRR calculation spreadsheet dated 12 April 2011

/16/ Guidance on the Assessment of Investment Analysis: (Version 03) from EB51

/17/ China Electric Power Yearbook 2003, 2004, 2005, 2006 and 2007

/18/ China Energy Statistical Yearbook 2005, 2006 and 2007

/19/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories

/20/ The approval letter for the proposed project connecting to grid by North China Power Grid Company Limited dated 14 February 2008. No.HuaBei DianWang YingXiao 2008(15)

/21/ 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

/22/ State Power Corporation of China. Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects. Beijing: China Electric Power Press, 2003

/23/ Mr. Pengfei Shi, vice general director of Chinese Wind Energy Association,

China Wind Energy Industry Report 2006 sourced from China Electric Power Yearbook 2007

/24/ Emission Reduction Purchase Agreement between the project owner and Shell Trading International Limited.(UK) dated 4 March 2008

/25/ 81 Copies of stakeholders consultation questionnaires.

/26/ CER calculation spreadsheet dated 21 May 2009

/27/ 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

/28/ The standard for calibration: Chinese electric industry regulation DL/T448-2000

/29/ The result and regional power grid information of EF calculated by China NDRC , which was published in 31 December 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

The result and regional power grid information of EF calculated by China is first published on 18 July 2008 and updated on 31 December 2008.

/30/ 02 October 2008, CDM prior consideration Notification confirmation from Chinese NDRC, that PPs previously informed on commencement of the project activity and of their intention to seek CDM status

/31/ 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)

Loan rate(over 5 years) , 7.83% as baseline interest rate which is published by the People's Bank of China from 15 September 2007 to 15 September 2008
http://www.pbc.gov.cn/detail.asp?col=460&ID=2483

City Build tax and Education tax：5% & 3% from No.GuoFa1985(19)& Decree No.448 of the state Council

VAT 8.5% from Caishui No.2001(198)published by National Ministry of Finance and Revenue Bureau

20% above from Economic Assessment method and parameters of construction project (version 03) p112

10 year above depreciation from income tax deduction method regulation, GuoShuiFa (2000)84

/32/ Department of Energy&Climate Change as DNA for CDM (UK DNA), list of projects with UK approval of participation, as of 11 October 2010

/33/ National Standard (GB/T 18710-2002), Methodology of wind energy resource assessment for wind farm

/34/ The turbines and generators purchasing contract signed on 29 August 2008.

/38/ 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

/39/ EB, Glossary of CDM Term, version 05, 19 August 2009

/41/ AM_Tool_01 "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02 (EB41 Annex 11)
http://cdm.unfccc.int/Reference/tools/index.html

/42/ AM_Tool_01 "Combined tool to identify the baseline scenario and demonstrate additionality" version 2.2 (EB28 Annex 14)
http://cdm.unfccc.int/Reference/tools/index.html

/43/ EB49, version 03, Guidance on the demonstration and assessment of prior consideration of the CDM

/44/ Hebei Guyuan county Dongxinying 199.5 MW wind farm civil work and installation contract signed on 17 August 2008

/46/ Starting construction permission issued on 25 August 2008 by the supervision company contracted

/47/ EB48, annex11, the guidelines for the reporting and validation of plant load factors

/49/ The evidence of wind resource layout in China:
http://cwera.cma.gov.cn/upload/b_2_left_02.jpg; published by China Meteorological Administration

/50/ the notification of DNA of China regarding the approval of application for CDM projects in China till 11 September 2009
http://cdm.ccchina.gov.cn/web/index.asp

/51/ European Wind Energy Association, Wind Energy_the Facts, 13 February 2009.
http://www.wind-energy-the-facts.org/en/downloads.html

/52/ Hebei Kangbao Wolongtushan 30 MW Wind Farm Project, registration No.0878.
Guyuan 30.6MW Wind-farm Project, registration No.0873.

/53/ Authorized representation agreement between Shell Trading International Limited and Shell International Trading and Shipping Company Limited, 6th November 1998

/54/ FSR development contract signed for Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project, June 2007

/56/ Notice regarding adjustment of the price of electricity in NCPG issued by NDRC of China, NDRC price [2008]1677, 29 June 2008

/58/ Hebei Construction Investment Zhangjiakou Wind Energy Co.,Ltd., the board meeting minutes regarding decision of main stock transferring to Hebei Construction Investment New Energy Co.,Ltd, 15 September 2006

/59/ NDRC, the approval of CECIC HKC Danjinghe Wind Farm project, No. fa-gai-neng-yuan (2007) 654, dated 26 March 2007.

/60/ National Development and Reform Commission, the approval of programme for development of wind projects in Bashang region of Zhangjiakou city of Hebei province, No.fa-gai-neng-yuan(2007)1283, dated 13 June 2007

/61/ NDRC, Notice regarding regulation of grid-in tariff for wind farm, No. Fa-Gai-Jia-Ge(2009)1906, dated 20 July 2009.

/62/ China Environment Science Press, China Wind Power Report 2008, dated October 2008.

/63/ Hebei Planning Commission, (Jijiwai(1995)No.1021), dated 23 November 1995;
Power Ministry of China, (Diananshengsheng(1997)No.190), dated 8 April 1997.
FSR approval of the Zhangbei Changcheng wind project,

/64/ Hebei Planning Commission, FSR approval of Hebei Hongsong Phase I (Jijiziyuan(2000)1028), 13 November 2000.

/65/ New Energy Net, The Tariff of Chinese Wind Project will be Stable in the Short Term, http://www.newenergy.org.cn/Html/0075/2007530_13764.html

/66/ Shijiazhuang Lianhua Certified Public Accountants, the audit report for financial status of the project till 30 Sept.2010, shi-lian-hua-zhuan-zi(2011)1003, dated 12 May 2011.

/67/ Heibei Finance Administration, the business certificate for Shijiazhuang Lianhua Certified Public Accountants,, No.008899, dated 1 December 2009.

## 2.2 Follow-up Interviews with Project Stakeholders

On 22 December 2008, the validation team had carried out on-site visit to confirm selected information and to resolve issues identified in the document review. Representatives of Hebei Construction Investment New Energy Co.,Ltd. and Redox International Consulting (Beijing) Co. Ltd. were interviewed.

The main topics of the interviews are summarized in the table below

| | Date | Name | Organization | Topic |
|---|---|---|---|---|
| /I/ | 2008-12-22 | YANG Xiaohua<br>ZHAO Yongchao | Hebei Construction Investment New Energy Co., Ltd. | – Project background information<br>– Project technology, operation, maintenance and monitoring capability<br>– Project additionality<br>– Project financial structure<br>– Project monitoring and management plan<br>– Project approval status<br>– Stakeholder consultation process |
| /II/ | 2008-12-22 | ZHU Qingrong<br>YUAN Xue | Redox International Consulting (Beijing) Co. Ltd. | – Project design document<br>– Baseline determination<br>– Emission reductions calculation<br>– Project additionality<br>– 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 customized 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 organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the auditor 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 the Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project is enclosed in Appendix A to this report.

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

i) mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) 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 c**orrective 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 including the initial validation findings has undergone a 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 | 1.1, 1.2, 4.5 | TÜV Rheinland Shanghai Ltd |
| *Team Member* | Sequoia A | 1, 4 | TÜV Rheinland Shanghai Ltd |
| *Technical Reviewer* | Zhou Kai | 1, 5 | TÜV Rheinland Guangzhou Ltd. |
| Technical Reviewer | Cuiping Deng2 | 1.2, 5.1, 11.1, 12.1 | TÜV Rheinland (China) Co., Ltd. |

2 TR was transferred to Ms Deng Cuiping on 6 April 2011.

# 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 New Energy Co., Ltd. of China and Shell Trading International Limited.(UK) of the United Kingdom of Great Britain and Northern Ireland. The host Party China and the participating Annex I Party the United Kingdom of Great Britain and Northern Ireland meet the requirements to participate in the CDM.
China and the United Kingdom of Great Britain and Northern Ireland respectively ratified the Kyoto Protocol on 30 August 2002 and 31 May 2002, whose participations are voluntary.
The letter of approval from the DNA of China has been received from the project participant and verified that Hebei Construction Investment New Energy Co., Ltd. is authorized as project participant of Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project and also confirmed that the project assists in achieving sustainable development of the hosting country/3/.
The letter of approval from the DNA of the United Kingdom of Great Britain and Northern Ireland /4/ has been received from the project participant and verified that Shell Trading International Limited (UK) is authorized as project participant of Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project.
The letters of approval from the Parties are unconditional with respect to information above stated as same as requirements of VVM45/6/.

The both of project participants approved by the Parties/3//4/ are in accordance with project participant information in the A3 of PDD, which is in line with Annex I of PDD. None of other project participants is involved in the PDD.

The below table summarizes the project participants and parties involved. The authenticity of the letters of approval have been validated by verifying the notification of DNA of China regarding the approval of application for CDM projects in China till 11 September 2009/50/ and the notification from DNA of UK regarding approval of the application for the CDM project/32/.

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

No public funding from an Annex I Party is involved in the project and the review of documents 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.

By reviewing the MoC and PDD it is confirmed that the information regarding proposed project and project participants in the PDD are in line with MoC/5/.

| **Project participants** | 1. Hebei Construction Investment New Energy Co., Ltd. | 2. Shell Trading International Limited.(UK) |
|---|---|---|
| **Parties involved** | P.R. China (host) | The United Kingdom of Great Britain and Northern Ireland |
| **APPROVAL** | | |
| LoA received | Yes/3/ | Yes/4/ |
| Date of LoA | November 2008 | 20 April 2010 |
| Reference to document | No. 1566 | No. STIL/03/2010 |
| LoA received from | PP | PP |

| | | |
|---|---|---|
| Validation of authenticity | Verifying the notification regarding the approval for application for CDM projects in China from DNA of China/50/ | Verifying the LoA |
| 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 | N/A | No |
| Project contribution to SD | Yes | N/A |

## 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 199.5MW wind farm. Based on FSR and approval from NCPG Company/13/&/20/ which are verified by the validation team, the electricity generated will be delivered to the North China Power Grid (NCPG)/13/&/20/ through 133 sets of transformers with each capacity of 1600kVA from 690V to 35kV, which will be connected to the new built 220 kV east substation on the wind farm. All the electricity generated by the wind farm will be transferred to the NCPG via the 500kV Guyuan substation, to which the electricity is delivered from the new-built 220 kV east substation through new built 220 kV transmission lines. The project is located in the south and southwest of Guyuan County, Zhangjiakou City of Hebei Province. The geographical coordinates of the project are 115.2997°～115.7508°′E, 41.3169°～41.5661°N/13/.

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 133 wind turbines each of a capacity for 1500 kW. As per the FSR/13/, the installation also includes measurement and surveillance of the wind farm operation.

The project will generate greenhouse gas (GHG) emission reductions by avoiding $CO_2$ emissions from electricity generation by fossil fuel power plants and it is expected to have a net annual power output of 405,685MWh at a plant load factor of 23.22%. The power generation has been determined in the FSR/13/. Based on the historical wind data of year 1971 to 2006 from the local weather station and professional analysis referred to in the page 9 to 104 and page 121 to 134 of FSR/13/, the estimation on electricity output to grid was carried out by North China Power Engineering (Beijing) Co., Ltd. contracted by Hebei Construction Investment New Energy Co., Ltd. /54/(North China Power Engineering (Beijing) Co., Ltd. is authorized by National Development and Reform Commission on 26 October 2003 as A class accredited consultant for consulting engineering such as developing FSR etc./13/), then, an average load factor of 23.22% applied has been considered to be appropriate.

The project activity starting date was 17 August 2008 when the construction contract was signed /44/ as it is earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity as per the Glossary of

CDM Term version 05/39/. The starting date of the first crediting period will be 1st Dec. 2011 or date of registration, whichever is later. Based on the approved FSR /13/ the expected operational lifetime of the project activity is 22 years. A renewable crediting period of 7 years has been chosen by the project participants starting on 1st Dec. 2011 or the date of registration, whichever is later. The project is expected to reduce GHG emissions of estimated 427,936 $tCO_2e$ per year and 2,995,552 $tCO_2e$ over the first seven-year crediting period.
The validation team confirmed that the proposed project activity is in accordance with 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 November 2008(LoA) /3/.

The relevant documents/3//13//20//39//44//54/ were verified and the project site was visited by the validation team during desk review and follow up interview and confirmed that the project description in the PDD is accurate and complete for the proposed project.

| *Starting date of project* | *Expected project operational lifetime* | *Crediting period* |
|---|---|---|
| 17 August 2008 is the construction contract signed date, as project activity starting date/44/. | 22 year/13/ | Renewable crediting period Starting of the first crediting period will be 1st Dec.2011 or date of registration, whichever is later. |

## 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”/9/. 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/13//20/;
- It does not involve switching from fossil fuel to renewable energy at the project site/13/;
- The proposed project activity is connected to the NCPG/20/ for which the geographical and system boundaries are clearly identified and information on the characteristics of this grid is available/17/

It is confirmed by checking the approval letter for the proposed project connecting to grid by North China Power Grid Company Limited dated 14 February 2008 /20/ and FSR/13/, that the proposed project would be connected to NCPG and is renewable power generation by utilizing wind resource with no involvement of switching from fossil fuel to renewable energy at the project site.

The geographical and system boundaries of the NCPG to which the proposed project is to connect are clearly identified and information on the characteristics of the grid is available from the source of DNA of China/17//29/.

Thus the validation team considers the approved baseline methodology ACM0002 (version 12.1.0) and the tools referred to in the methodology are applicable to the proposed project/9//10//11/, except the “Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion”/41/ and Combined tool to identify the baseline scenario and demonstrate additionality/42/ referred to in the ACM0002 version 12.1.0 due to no fossil fuel combustion in the project site and no retrofit and replacement involved in the project activity, which are confirmed by PP and FSR/13/. This is from VVM 76 paragraph and registration-reporting requirement check.
The selected sources and gases are justified for the project activity.
The version of the methodology is 07 for public of PDD and updated to be 12.1.0 for request for registration.
there is no project activity’s GHG emissions which will contribute more than 1% of expected ER per year and which are not addressed in the applied methodology

### 3.4.2 Project Boundary

By checking the approval letter for the proposed project connecting to grid by North China Power Grid Company Limited dated 14 February 2008/20/ and approved FSR in January 2008/13/, the proposed project is to be connected to NCPG. Based on the methodology/9/, the spatial extent of the project boundary is clearly defined as the site of project activity and all power plants connected physically to NCPG including Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia and Shandong, to which the project is connected./17/ According to the China Electric Power Yearbook /17/, NCPG is itself currently importing electricity from another power gird, i.e. North-East Power Grid (NEPG) and Centre China Power Grid(CCPG) In Year 2006, the imported electricity from NEPG and CCPG contributes approximately 0.4% & 0.07% to the overall power generation in NCPG.

This is in line with the delineation of grid boundaries as provided by the DNA of China on 18 July 2008/29/. There are no significant transmission constraints between the power plants of the NCPG.

Other than NEPG and CCPG, there is no net electricity influx from any other power grids to the NCPG. The baseline emission factor calculation is hence considered comprehensively covering the neighbor power grids which exert influence to the baseline emission.

The relevant information is sourced from DNA of China/29/ and approved FSR/13/ and on-site validation. By checking the information and the project site, the validation team can confirm that the project boundary and emission sources described in the PDD are accurate and complete.

The defined project boundary is in line with ACM0002 (version 12.1.0). Emissions sources included in or excluded from the project boundary are shown in below table:

| | GHGs involved | Included | Justification |
|---|---|---|---|
| Baseline emissions | $CO_2$ | yes | Main emission source from Grid |
| | $CH_4$ | No | Minor emission source. |
| | $N_2O$ | No | Minor emission source. |
| Project emissions | $CO_2$ | No | This is not applicable to the wind project. |
| | $CH_4$ | No | This is not applicable to the wind project. |
| | $N_2O$ | No | This is not applicable to the wind project. |

### 3.4.3 Baseline Identification

According to the description in the approved baseline methodology ACM0002 (version 12.1.0), 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".

Based on FSR/13/ and the approval letter for the proposed project connecting to grid by North China Power Grid Company Limited /20/, the project activities will do not modify or retrofit an existing electricity generation i.e. a new built renewable power plant and will be connected to North China Power Grid. So North China Power Grid is considered as the "grid/project electricity system", which is defined as the "project boundary" of the proposed project.

According to China Electric Power Yearbook/17/, 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/13/&/17/&/20/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 (Figure B.1) 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 /9/, 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). 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 identification in the PDD is correctly and reasonable. The list of alternatives to the proposed project identified in the B5 of PDD is verified in the section 3.5.2 as below and confirmed that they are complete.

| | | |
|---|---|---|
| *The approved baseline methodology applicable to the project* | ■ Yes<br>☐ No | ACM0002/Version12.1.0 |
| *PDD includes all assumptions and data used by project participants* | ■ Yes<br>☐ 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 (Figure B.1) 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 |
| *All the references and documents used are relevant for establishing the baseline scenario* | ■ Yes<br>☐ No | Full argument and references has been carried out in this section and PDD. |
| *All the references and documents used are correctly quoted and conservatively interpreted in the PDD* | ■ Yes<br>☐ No | The FSR and its approval as well as the China Electric year books have been correctly quoted and conservatively interpreted in the PDD. |
| *All relevant policies / regulations considered are listed in the PDD* | ■ Yes<br>☐ No | All relevant policies / regulations considered in PDD. |
| *Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity* | ■ Yes<br>☐ No | The approved baseline methodology ACM0002/version 12.1.0 has presented clearly the baseline. |
| *The baseline scenario selection is appropriate and determined according to the methodology* | ■ Yes<br>☐ 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. |
| *The approved methodology used is* | ■ Yes | The approved methodology has identified baseline scenario: Electricity |

| | | |
|---|---|---|
| *applicable to the identified baseline scenario* | ☐ No | 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 ($L_y$), as follows:

1) Baseline emissions: baseline emissions ($BE_y$ in $tCO_2$) are the product of the baseline emissions factor ($EF_y$ in $tCO_2$/MWh) times the net electricity supplied by the project activity to the grid ($EG_y$ in MWh).

2) Project emissions: there are no emissions from the project which is a renewable energy project.

3) Leakage: no leakage has to be considered for the proposed project activity.

4) Emission reduction: $ER_y = BE_y - PE_y - L_y = BE_y$.

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 2.0 /11/.

The PDD used the available data for calculation of the grid emission factor with China Energy Statistics Yearbooks 2005-2007/18/ and China Electric Power Yearbooks 2003-2007/17/ and relevant result of calculation published by Chinese NDRC in December 2008/29/. This was at the time of requesting registration of the project to the data available.

According to the data from China Electric Power Yearbook /17/, 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. 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 ($NCV_i$) of each type of fossil fuel, the IPCC 2006 default values for the oxidation factor of each type of fossil fuel and the total electricity delivered to the NCPG are selected and are deemed reasonable. Vintage data for the years 2004, 2005 and 2006 from China Energy Statistics Yearbooks/18/ and China Electric Power Yearbooks 2005-2007/17/ editions are used for the operating margin calculation..

According to ACM0002, if net imports do not exceed 20% of total generation in the project electricity system, the average emission rate of the exporting grid is adopted, and exports should not be subtracted from electricity generation data used for calculating the baseline emission. Project electricity system of the proposed project is NCPG and the imported power generation (2,618,060MWh) from ECPG to NCPG is only 0.04% of the total generation (669,506,473MWh) from ECPG, the electricity imports (497,060MWh) from CCPP to NCPG is only 0.07% of the total generation from CCPG, furthermore these two percentages have not changed significantly in recent years, so the respective average emission rate of ECPG and CCPP is taken as the emission factor of the import electricity.

Based on these data, the simple OM emission factor of North China Power Grid (NCPG) is calculated as 1.1169 $tCO_2$ /MWh as a generation-weighted average for the three years, which can be verified with the spreadsheet for OM calculation from China NDRC/29/.

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" /12 / 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;
- 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 $CO_2$ 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 /18/and the $CO_2$ emission factor of each type fuel referred to 2006 IPCC Guidelines for National Greenhouse Gas Inventories/19/.

- 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 /29/.

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 0.8687 tCO2/MWh.

The weights ωOM and ωBM 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 1.05485 tCO2/MWh is fixed ex-ante for the entire first crediting period.

According to FSR/13/, the proposed project activity is estimated to supply 405,685 MWh per year, the calculation result of the estimated emission reduction is totally 427,936 $tCO_2$ 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 and from China Electric Power Yearbooks 2003 to 2007 /17/&/18/.

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. By on site visit it is found that no fossil fuel equipment is used.

| | | |
|---|---|---|
| *All assumptions made for estimating GHG are listed in the PDD* | ■ Yes<br>☐ No | The estimated emission reduction is totally 427,936 $tCO_2$ per year for the proposed project<br>Detail listed in section B6.2 and Annex 3 of PDD/2/. |
| *All data used by project participants are listed in the PDD* | ■ Yes<br>☐ No | Detail listed in section B6.2 of PDD/2/ |
| *Their references and sources are also listed in the PDD* | ■ Yes<br>☐ No | China Electric Power Yearbooks 2003-2007 /17/<br>China Energy statistics Yearbooks 2005-2007/18/<br>Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories/19/<br>The result of EF calculated by China NDRC , which was published on 31 December 2008 /29/(note: the result and regional power grid information of EF calculated by China is first published on 18 July 2008 and updated on 31 December 2008. ) |
| *Formulas, parameters, values are complete, accurate, transparent and conservative* | ■ Yes<br>☐ No | Detail listed in section B6.1 & Annex 3 of PDD/2/ |
| *All the references and documents used are correctly quoted and conservatively interpreted in the* | ■ Yes<br>☐ No | All the references and documents used in PDD have been verified and confirmed be DOE. |

| | | |
|---|---|---|
| *PDD* | | |
| *Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions* | ■ Yes<br>☐ No | Since the project activity is the installation of a new grid-connected renewable power plant/unit, the applicable Methodology is as following:<br>Approved Baseline & Monitoring Methodology: ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", version 12.1.0/9/ and AM_Tool_07 "Tool to calculate the emission factor for an electricity system" Version 02 /11/ |
| *All the emissions of baseline emissions can be replicated using information provided in the PDD* | ■ Yes<br>☐ No | For the project activity, only a new grid-connected renewable power plant/unit will be installed./13/ 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/9/. |

## 3.5 Additionality

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

The additionality of the proposed project is demonstrated in the PDD by using the investment analysis method of the Tool for the demonstration and assessment of additionality/10/ and the proposed project is considered to be additional since the project IRR of the project /13/ is lower than the benchmark of 8% /22/and the similar wind farm to the proposed project is difficult to operate without any additional financial or local policy support in Hebei province.

The validation team can confirm that all data, rationales, assumptions, justifications and documentation provided by the project participants to support demonstration of additionality are credible and reliable.

By cross checking the relevant evidences based on the local and sectoral knowledge and experience, the validation team considers the arguments for the proposed project additionality demonstration/1/ is credible and reasonable i.e. the proposed project has its ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered CDM project activity.

The above opinion of validation team to the additionality of the proposed project is further explicitly explained as following steps

### 3.5.1 CDM consideration

It has been demonstrated that CDM was seriously considered before the decision to go ahead with the proposed project by the following activities in accordance with the "Guidance on the demonstration and assessment of prior consideration of the CDM"/43/.

#### 3.5.1.1 The starting date definition

The timeline of implementation of the project illustrated below has reviewed by the validation team and considered to be valid and realistic.

| Date | Major Activity | Evidence /reference no./ |
|---|---|---|
| 19 November 2007 | The environmental impact assessment report is approved | EIA approval/14/ |
| January 2008 | Feasibility Study Report completed. | FSR/13/ |
| February 2008 | The local stakeholder comments are collected | Questionnaires/25/ |

| | | |
|---|---|---|
| 4 March 2008 | ERPA signed with CER Buyer authorized representative. | ERPA/24/<br>Authorized representation contract/53/ |
| 4 June 2008 | FSR approved by National Development and Reform Committee | FSR approval letter/13/ |
| 17 August 2008 | Construction contract signed | Construction contract/44/ |
| 25 August 2008 | Construction permission is issued | Construction permission/46/ |
| 29 August 2008 | Turbines purchasing contract signed | Turbine purchasing contract/34/ |
| 2 October 2008 | Notification informing Chinese DNA the commencement of the project is confirmed by DNA | The notification/30/ |
| 13 November 2008 | Start of GSP | |

Thus the proposed project starting date is 17 August 2008 when the construction contract was signed /44/as they are the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity as per the Glossary of CDM Term version 05/39/.

**3.5.1.2 Awareness of the CDM prior to the project activity start date and continuing and real actions were taken to secure CDM status for the project in parallel with its implementation**

Since the proposed project activity is started on 17 August 2008 before the validation date when the PDD is public for globe stakeholder consultation begun from 13 November 2008, it must be demonstrated that the incentives from CDM is considered seriously by the project participants according to the EB requirements/10/. By considering the starting date of the proposed project is after 2 August 2008, this project is thus treated as the new project /43/. The DNA of China confirmed on 2 October 2008 that Hebei Construction Investment New Energy Co., Ltd. as the project participant submitted the notification, which is informing the DNA of China of the commencement of the project activity and of their intention to seek CDM status within lower than six months after the starting date (i.e. 17 August 2008) /44/. The precise location is described as same as the FSR/PDD and the brief description of the proposed project is made in the notification, which is verified that it is in accordance with the Guidance on the demonstration and assessment of prior consideration of the CDM version 1 which is available at the time of starting date on 17 August 2008 and then it is also conformity with the version 03/43/

| Starting date of project | Justification of and evidences (references) on the starting date of project | Date of CDM consideration |
|---|---|---|
| 17 August 2008 on which the construction contract is signed/44/ | Construction contract is signed on 17 August 2008/44/<br>Turbines purchasing contract is signed on 29 August 2008/34/<br>The construction contract signed date is thus considered as the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity.<br>Thus the starting date is considered as 17 August 2008 as per the Glossary of CDM | On 2 October 2008, a Notification from the project participant was confirmed by DNA of China/30/ |

| | | |
|---|---|---|
| | Term version 05/39/ | |

Thus, it can be verified by the validation team that the incentive from the CDM was seriously considered in the decision to proceed with the project activity by the project owner in accordance with the Guidance on the demonstration and assessment of prior consideration of the CDM/43/.

### 3.5.2 Alternatives

Based on "Tool for the Demonstration and Assessment of Additionality (version 5.2)", which was approved in the EB 39/10/, the alternative scenarios for the project activity consistent with current laws and Regulations have been identified in B.5 of PDD by PP/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 "the announcement which strictly forbids the construction of thermal power stations with an installed capacity lower than 135WM published by the State Council Office, Guo Ban Fa Ming Dian[2002] No.6"/21/, 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.

The validation team has verified the above documents supported to the arguments and confirm they are reliable and credible. The validation team can confirm that the alternatives identified in the PDD are complete.

The possible baseline scenarios are the alternative (a) and the alternative (c).

As section 3.4.3 analysis the alternative (c) is confirmed to be the baseline scenario as per methodology ACM0002 (version 12.1.0). Thus the alternative (a) will be analyzed for its additionality as per the Guidance on the Assessment of Investment Analysis (Version 02)/16/ and Tool for the Demonstration and Assessment of Additionality (version 05.2)/10/.

### 3.5.3 Investment analysis

A benchmark analysis (Option III of Step 2 of tool for the demonstration and assessment of additionality) 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/22/. 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)/13/, based on the data of which the project IRR without CER revenues accounts to 6.43 % /13//15/, which indicates that the project in the absence of CDM benefits is not financially attractive due to its lower than the benchmark of 8%/22/

#### 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 02)/16/.

#### 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/22/. 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

In line with the EB guidance in EB38 minutes of meeting paragraph (54), the validation team has

validated the input parameters used in the investment analysis and the procedures are as following:

***Step 1: Assess the sources of the input parameters and confirm the consistency of the values***

a) All data and parameters including tariff of 0.5006RMB/kWh (VAT incl.) used for the financial analysis in the PDD have been sourced from the feasibility study report (FSR) /13/, which is developed in January 2008 by North China Power Engineering (Beijing) Co., Ltd.(accredited by National Development and Reform Commission on 26 October 2003) and approved by National Development and Reform Commission on 4 June 2008/13/. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

b) The validation team has compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR /13/ and was able to confirm that the values applied are consistent with the value stated in the FSR. Thus, all the details used for the IRR calculation were available at the time when decision to proceed with the project was made (i.e. the starting date when the construction contract is signed on 17 August 2008) /44/

***Step 2: Assess the period of time between the finalization of the FSR and the investment decision***

c) The FSR was finalized in January 2008 and approved on 4 June 2008/13/ and thus only 7 months prior to the decision to proceed with the project activity which was on 17 August 2008/44/. Given this sufficiently short period of time between finalization 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/13/ have been the basis of the decision to proceed with the investment in the project.

***Step 3: Cross-check the parameters used in the financial analysis with the parameters used by other similar projects***

d) Based on local and sectoral expertise, the input parameters used in the financial analysis were compared with the data reported for other similar CDM projects registered in Hebei province. By comparing the investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs and average load factor, 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.

***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 electricity tariff applied***

■ ***the applied tariff of 0.5006RMB/kWh (VAT incl.) for investment analysis in the FSR for initially 30,000 hours operation time since the starting date is appropriate at the time of decision for investment of the proposed project.***

The tariff of 0.5006RMB/kWh (incl. VAT) for first 30,000 operation hours used for financial analysis of the proposed project is derived from the approved FSR, the tariff of which is set based on the approval of programme for development of wind projects in Bashang region of Zhangjiakou city of Hebei province issued in June 2007/60/ and the tariff of CECIC HKC Danjinghe Wind Farm (200MW) approved by NDRC on 26 March 2007/59/ at that time of preparation of FSR/13/. By reviewing the approval of programme for development of wind projects in Bashang region of Zhangjiakou city of Hebei province/60/, it is stated that the wind projects to be constructed in Bashang region of Zhangjiakou city of Hebei province should be constructed and managed as same as the tariff and relevant conditions of CECIC HKC Danjinghe Wind Farm (200MW) and the tariff of which is 0.5006RMB/kWh (VAT incl.) for first 30,000 operation hours.

The Validation team verified that for the proposed project, the expected feed-in tariff of 0.5006 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 similar scale local wind farms in Hebei province as follows:

►Tariff approval document (Fa Gai Neng Yuan [2007]654) issued by NDRC on 26 March 2007, document No. Fa Gai Neng Yuan [2007]654/59/

►Tariff approval document (Fa Gai Neng Yuan [2007]1283) issued by NDRC on 13 June 2007, document No. Fa Gai Neng Yuan [2007]1283/60/

Besides the validation team has crosscheck the Notification regarding approval of the proposed project including tariff issued by NDRC on 4 June 2008 (1325)/13/ which is after FSR completion and it is found that tariff of the proposed project is 0.5006RMB/kWh (VAT incl.). Thus it is also in line with expected tariff of proposed project.

The validation team therefore concluded that the applied tariff of 0.5006RMB/kWh for first 30,000 operation hours for investment analysis in the FSR is appropriate.

. ■ ***the applied tariff of 0.40RMB/kWh (VAT excl.) for investment analysis in the FSR for the remaining operation time after 30,000 hours operation time since the starting date is appropriate at the time of decision for investment of the proposed project.***

By reviewing the approval of programme for development of wind projects in Bashang region of Zhangjiakou city of Hebei province/60/, it is stated that that the wind projects to be constructed in Bashang region of Zhangjiakou city of Hebei province should be constructed and managed as same as the tariff and relevant conditions of CECIC HKC Danjinghe Wind Farm (200MW)/59/ and the tariff of which for the remaining operation time after 30,000 operation hours since the starting date is regulated to be local average feed-in tariff. The tariff of the proposed project for the remaining operation time after 30,000 operation hours since the starting date is estimated in the FSR to be 0.40RMB/kWh (VAT excl.). It is considered appropriate by considering the Hebei provincial thermal power benchmark feed-in tariff is 0.3664 RMB/kWh (VAT incl.) approved by NDRC on 29 June 2008/56/ since it is available latest at the decision to proceed with the proposed project (17 August 2008).

The validation team therefore concluded that the applied tariff of 0.40RMB/kWh for investment analysis in the FSR for remaining operation time after 30,000 hours operation since the starting date is appropriate.

■ ***the applied tariff of 0.5006 RMB/kWh (VAT incl.) for investment analysis in the PDD for whole lifetime of the proposed project since the starting date is appropriate at the time of decision for investment of the proposed project***

However the tariff of 0.5006 RMB/kWh (VAT incl.) is used in the PDD for investment analysis for whole lifetime, considering above analysis result regarding appropriateness of tariff used in the FSR for investment analysis, the validation team can concluded that the tariff of 0.5006 RMB/kWh (VAT incl.) is used in the PDD for investment analysis for whole lifetime is appropriate, conservative and 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 (wind turbine installed) | Project | Tariff (with VAT) Yuan/kWh | Reference | CDM status |
|---|---|---|---|---|---|
| **Prior to the Power Sector Reform (March 2002)** | | | | | |
| 1 | 1996-1998 | Zhangbei Changcheng 9.85MW wind farm | 0.65 | Ji Jia Ge [3][2002]242 issued by NDRC in Feb 2002[3]* | Early demonstration and ODA funded projects |
| 2 | 2001.11 | Chengde Hongsong 3.6MW wind farm | | | |

| The Electric Power Sector Reform Programme (March 2002): Projects in Wind Resource Area Ⅱ of Hebei (Chengde City and Zhangjiakou City) | | | | | |
|---|---|---|---|---|---|
| 3 | 2005.11 | Chengde Hongsong wind farm | 0.6 | Ji Jia Guan Zi [2006]57 issued by Price Bureau of Hebei province In Jun 2006[4] | VER |
| 4 | 2005.7 | Guohua Shangyi Manjing wind farm | 0.6 | | VER |
| 5 | 2006.11 | Hebei Shangyi Manjing East Wind Farm | 0.6 | | Ref No.0842 Registered |
| 6 | 2006.5 | Zhangbei Manjing Wind Farm | 0.6 | | Ref No.0233 Registered |
| 7 | 2006.12 | Zhangbei Mijiagou 49.5 MW Wind Farm | 0.6 | | Ref No.0845 Registered |
| 8 | 2006.1 | Hebei Kangbao Wolongtushan 30 MW Wind farm | 0.6 | | Ref No.0878 Registered |
| 9 | 2007.8 | Guyuan 30.6MW Wind Farm | 0.54 | Fa Gai Jia Ge [2007]1260 issued by NDRC in Jun 2007 | Ref No.0873 Registered |
| 10 | 2005.11 | Hebei Chengde Songshan Wind farm | 0.54 | | Ref No.0877 Registered |
| 11 | 2007.12 | Hebei Chongli Qingsanying 49.3MW Wind Farm | 0.54 | | Ref No.2140 Registered |
| 12 | after 2007.12.31 | Hebei Shirenshan Wind farm | 0.54 | | Ref No.2067 Registered |
| 13 | after 2007.12.31 | Hebei Wanquan Yulong Wind farm | 0.54 | | Ref No.2205 Registered |
| 14 | after 2007.12.31 | Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project | 0.54 | | Ref No.2088 Registered |
| 15 | 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 Registered |
| 16 | after 2007.12.31 | Hebei Weichang Zhangjiawan Wind farm | 0.54 | | Ref No.3093 |
| 17 | after 2007.12.31 | Hebei Weichang Longyuan Construction Investment Shanwanzi Wind farm | 0.54 | | Ref No.2870 Registered |
| 18 | 2007 | Hebei Shangyi Qijiashan Wind Farm | 0.5006 | Fa Gai Neng Yuan [2008]1812issued by NDRC in July 2008 | Ref No.1854 Registered |
| 19 | 2007 | CECIC HKC Danjinghe Wind Farm | 0.5006 | 2008 Wind Power Report | Ref No.2170 Registered |
| 20 | after 2007.12.31 | CECIC HKE Zhangbei Lvnaobao Wind Power Project (100.5MW) | 0.5006 | Fa Gai Neng Yuan [2008] 1815 issued by NDRC in Jul 17, 2008 | Ref No.3399 Registered |
| 21 | 2008.7 | SDIC Hebei Zhangjiakou Kangbao Pasture Wind Farm Project (100.5MW) | 0.5006 | Fa Gai Neng Yuan [2007] 1283 | CDM under validation |
| 22 | 2007 | Hebei Guyuan | 0.5006 | Fa Gai Neng Yuan | CDM under |

| | | | | | |
|---|---|---|---|---|---|
| | | County Dongxinying 199.5 MW Wind Power Project | | [2008] 1325 issued by NDRC in June 2008 | validation |
| 23 | 2007 | Hebei Chengde Yudaokou wind farm | 0.551 | 2008 Wind Power Report | Ref No.3476 |
| 24 | 2007.12 | CECIC Zhangbei Dayangzhuang Wind Farm | 0.54 | Fa Gai Jia Ge [2008]1876 issued by NDRC in July 2008 | Ref No.1855 Registered |
| 25 | | 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 Registered |
| 26 | | Hebei Chengde Fengze | 0.54 | | Ref No.1715 Registered |
| 27 | | Hebei Chongli Qingsanying Phase II | 0.54 | | Ref No.4123 |
| 28 | | Hebei Yuxian Kongzhongcaoyuan phase II | 0.54 | | Under validation |
| 29 | | Hebei Kangbao sanxiatian | 0.54 | | Ref No.3312 Registered |
| 30 | | Hebei guyuan wuhuaping | 0.54 | | Ref No.3356 Registered |
| 31 | | CECIC zhangbei phase IIII | 0.54 | | Ref No.1895 Registered |
| 32 | | Longyuan Baimiaotan | 0.54 | | Under validation |
| 33 | | Hebei Shangyi Longyuan Wind Power Project | 0.54 | | Ref No.3704 |
| 34 | | Guohua Chicheng Dushikou West Wind Farm Project | 0.54 | | Under validation |
| 35 | | Zhangbei bode longxiaoertai wind farm | 0.54 | | Applying CDM |
| 36 | | Guohua Shangyi Manjing North | 0.54 | | Ref No.1792 Registered |
| 37 | | Huarun weichang yudaokou | 0.54 | | Applying CDM |
| 38 | | Huarun yueliangshan | 0.54 | | Ref No.1464 Registered |
| 39 | | Huarun dongbaliang | 0.54 | | Ref No.1423 Registered |
| 40 | | Hebei Weichang Zhuzixia Wind power project | 0.54 | | Ref No.3743 |
| 41 | | Hebei Weichang Guangfayong Wind power project | 0.54 | | Ref No.3758 |
| 42 | | Hebei Chicheng Stage I Windfarm Project | 0.54 | | Ref No.3371 |
| 43 | | 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 Fa Gai Jia Ge | Ref No.4046 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | [2009]1906 issued by NDRC | |
| 44 | | Hebei Chengde Peifeng | 0.54 | Ji Jia Guan [2009]108 issued by Price Bureau of Hebei province in December 2009 according to the Fa Gai Jia Ge [2009]1906 issued by NDRC | Ref No.3079 Registered |
| 45 | | Hebei Chengde Runfeng Wind Farm Project | 0.54 | | Ref No 4073 Registered |
| 46 | after 2007.12.31 | Hebei Weichang Yangshugou Wind Power Project | 0.54 | | Under validation |
| 47 | after 2007.12.31 | Hebei Xiqiaoliang Farm Phase I Project | 0.54 | | Under validation |
| 48 | after 2007.12.31 | Hebei Weichang Dishuihu Wind power project | 0.54 | | Under validation |
| **The projects in Wind Resource Area Ⅳ of Hebei (rest of Hebei) #** | | | | | |
| 49 | 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 Registered |
| 50 | | Huaneng Leting | 0.61 | Ji Jia Guan [2009]69 issued by Price Bureau of Hebei province In Aug 2009 according to the Fa Gai Jia Ge [2009]1906 issued by NDRC | Ref No.3160 Registered |
| 51 | | Guohua Huanghua phase I | 0.61 | | Ref No.2125 Registered |
| 52 | | Guohua Huanghua phase II | 0.61 | Ji Jia Guan [2010]4 issued by Price Bureau of Hebei province In Jan 2010 according to the Fa Gai Jia Ge [2009]1906 issued by NDRC | Ref No.3021 Registered |

As listed in Table 0-1, it is confirmed by DOE that a total of 53 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 199.5MW of proposed project.

**Group 2**: 0.61RMB/kWh for four projects (49-52) which are located in Wind Resource Area IV of Hebei province and has a lesser wind resource. Therefore they have received 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**: 0.60RMB/kWh for six projects (3-8) which is approved by Price Bureau of Hebei province in June 2006 and located in the wind resource area II (Chengde and Zhangjiakou). But they are not large scale concession projects as the proposed project, thus the 0.60RMB/kWh is excluded in the tariff analysis of the proposed project.
**Group 4**: 0.54RMB/kWh for other projects are approved by NDRC from June 2007 and located in the wind resource area II (Chengde and Zhangjiakou). But they are not large scale concession projects as the proposed project, thus the 0.54RMB/kWh is excluded in the tariff analysis of the proposed project.
**Group 5**: 0.551 RMB/kWh for Hebei Chengde Yudaokou (23) is one of fifth concession projects confirmed by China wind power report 2008/62/ and located in the wind resource area II (Chengde and Zhangjiakou).
**Group 6**: 0.5006RMB/kWh for five projects (18-22) including the proposed project are large scale concession projects (more than 50MW) /62//60/and located in the wind resource area II (Chengde and Zhangjiakou)
It can be concluded by the validation team that the highest approved tariffs for concession wind farm projects which are located in same wind resource area II in Hebei (Chengde city and Zhangjikou city regions) should be 0.551 RMB/kWh, which was awarded to the project (No 23) 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 being public.
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 0.551RMB/kWh used in the spread sheet of proposed project, the IRR is calculated as 7.83%, still below 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 respectively high tariffs of 0.60, 0.61 and 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 for whole lifetime and the data used was listed in table below:

Table 0-2: the calculated reference tariff for whole lifetime of proposed project

| The 0.60RMB/kWh,approved tariff of wind farm projects in Wind resourse area IV | | |
|---|---|---|
| | IRR | Reference tariff |
| using the financial data of investment/O&M/tariff | 6.53% | 0.5045RMB/kWh |
| The 0.61RMB/kWh,approved tariff of wind farm projects in Wind resourse area IV | | |
| using the financial data of investment/O&M/tariff | IRR | Reference tariff |
| | 6.19% | 0.4909 RMB/kWh |
| The 0.65RMB/kWh,approved tariff of ealier two small pilot project | | |
| | IRR | Reference tariff |
| using the financial data of investment /tariff | 7.01% | 0.5244 |

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 | 11,801.5 | 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 1997/63/.<br>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. 2000/64/ | | | | |
| 2007 | Hebei Haixing 49.5MW Wind Farm * | 0.61 | 10,931 | 74.52 |
| 2125 | Guohua Huahua phase I | 0.61 | 9,938 | 134.47 |
| 3160 | Huaneng Leting | 0.61 | 11,247 | 102.18 |
| 3021 | Guohua Huahua phase II | 0.61 | 9,819 | 115.06 |
| | Average | 0.61 | 10,484 | 106.56 |
| | | | | |
| 0842 | Hebei Shangyi Manjing East Wind Farm | 0.60 | 197 | 9468 |
| 0845 | Zhangbei Mijiagou 49.5 MW Wind Farm | 0.60 | 95 | 9726 |
| 0878 | Hebei Kangbao Wolongtushan 30 MW Wind farm | 0.60 | 97 | 9170 |
| | Average | 0.60 | 130 | 9454 |

While the reference tariff calculation using the projects in the Wind Resource Area II which received a tariff of 0.60 RMB/kWh has also been carried out, the reference tariff on the basis of these projects can be calculated as 0.5045RMB/kWh. Thus the project is not economically attractive with this reference tariff because the project IRR is 6.53%, lower than the benchmark.
While the reference tariff calculation using the projects in the Wind Resource Area IV which received a tariff of 0.61 RMB/kWh has also been carried out, the reference tariff on the basis of these projects can be calculated as 0.4909RMB/kWh. Thus the project is not economically attractive with this reference tariff because the project IRR is 6.19%, lower than the benchmark.
Furthermore, 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 0.5244RMB/kWh. Thus the project is not economically attractive with this reference tariff because the project IRR is 7.01%, lower than the benchmark.

### ■ *Conclusion*

It is shown above that the relevant highest historical tariff for the proposed project activity is 0.551 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 and un-large scale concession wind projects in the same wind resource region II in Hebei would be considered, the project would not reach the benchmark. Thus the project is also additional even if the higher tariff of 0.60/0.61RMB/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 0.5244RMB/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.

***b) The assumptions for static investment cost of the project***

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

Table-investment cost per installed capacity for wind farm projects in Hebei province

| Project name | Reference No. | Installed capacity MW | Static investment Million RMB | Investment cost per KW(RMB/KW) | Tariff approved |
|---|---|---|---|---|---|
| Hebei Shangyi Manjing East Wind Farm Project | 842 | 49.5 | 468.66 | 9468 | 0.6 |
| Zhangbei Mijiagou 49.5 MW Windfarm Project | 845 | 49.5 | 481.42 | 9726 | 0.6 |
| Guyuan 30.6MW Wind-farm Project | 873 | 30.6 | 326.01 | 10654 | 0.54 |
| Hebei Chengde Songshan Wind Farm Project | 877 | 49.5 | 411.29 | 8309 | 0.54 |
| Hebei Kangbao Wolongtushan 30 MW Wind Farm Project | 878 | 30 | 275.09 | 9170 | 0.6 |
| Dongbaliang 49.5MW Wind Power Project in Weichang County Hebei Province | 1423 | 49.5 | 490.04 | 9900 | 0.54 |
| Yueliangshan 49.5MW Wind Power Project in Weichang County Hebei Province | 1464 | 49.5 | 474.04 | 9577 | 0.54 |
| Hebei Chengde Fengze Wind Farm Project | 1715 | 49.5 | 503.00 | 10162 | 0.54 |
| Hebei Shangyi Qijiashan Wind Farm Project | 1854 | 199.5 | 1837.78 | 9212 | 0.5006 |
| CECIC Zhangbei Dayangzhuang Wind Farm Project | 1855 | 49.5 | 378.17 | 7640 | 0.54 |
| Hebei Chengde Huifeng Windfarm Project | 1873 | 49.5 | 534.52 | 10798 | 0.54 |
| Hebei Haixing 49.5MW Wind Farm Project | 2007 | 49.5 | 541.06 | 10931 | 0.61 |
| Hebei Shangyi Manjing West Wind | 2040 | 49.5 | 455.67 | 9205 | 0.54 |

| | | | | | |
|---|---|---|---|---|---|
| Farm Project | | | | | |
| Hebei Shirenshan Wind Power Project | 2067 | 49.5 | 490.44 | 9908 | 0.54 |
| Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project | 2088 | 49.5 | 534.44 | 10797 | 0.54 |
| Guohua Hebei Huanghua 49.5 MW Wind Farm Project (Phase I) | 2125 | 49.5 | 491.93 | 9938 | 0.61 |
| Hebei Chongli Qingsanying 49.3MW Wind Farm Project | 2140 | 49.3 | 509.56 | 10336 | 0.54 |
| CECIC HKC Danjinghe Wind Farm Project | 2170 | 200 | 1547.40 | 7737 | 0.5006 |
| Hebei Wanquan Yulong Wind Power Project | 2205 | 36 | 336.64 | 9351 | 0.54 |
| Hebei Fengning Luotuogou 1st Phase Wind Power Project | 2462 | 48 | 506.18 | 10545 | 0.54 |
| Hebei Weichang Longyuan Construction Investment Shanwanzi Wind Power Project | 2870 | 49.5 | 530.04 | 10708 | 0.54 |
| Guohua Hebei Huanghua (Phase II) 49.5MW Windfarm Project | 3021 | 49.5 | 486.04 | 9819 | 0.61 |
| Hebei Chengde Peifeng Wind Farm Project | 3079 | 49.5 | 489.55 | 9890 | 0.54 |
| Hebei Weichang Zhangjiawan Wind Power Project | 3093 | 49.5 | 524.47 | 10595 | 0.54 |
| Hebei Leting 49.5 MW Wind Farm Project Phase I | 3160 | 49.5 | 556.74 | 11247 | 0.61 |
| Hebei Kangbao Sanxiatian Wind Farm Project | 3312 | 49.5 | 63868 | 12903 | 0.54 |
| Guyuan Wuhuaping 49.5 MW Wind Power Project | 3356 | 49.5 | 640.29 | 12935 | 0.54 |
| Hebei Chicheng Stage I Windfarm Project | 3371 | 49.5 | 486.61 | 9831 | 0.54 |
| CECIC HKE Zhangbei Lvnaobao Wind Power Project | 3399 | 100.5 | 890.79 | 8864 | 0.5006 |
| Shangyi Longyuan | 3704 | 150 | 1282.90 | 8553 | 0.5 |

| | | | | | |
|---|---|---|---|---|---|
| Wind Power Project | | | | | |
| Hebei Weichang Zhuzixia Wind Power Project | 3743 | 49.5 | 424.54 | 8576 | 0.6 |
| Hebei Weichang Guangfayong Wind power project | 3758 | 49.5 | 403.06 | 8143 | 0.6 |
| Dehe Zhangbei Phase I Wind Farm Project | 4046 | 49.5 | 451.64 | 9124 | 0.54 |
| Hebei Chengde Runfeng Wind Farm Project | 4073 | 49.5 | 491.43 | 9928 | 0.54 |
| CECIC Zhangbei Gaojialiang Wind farm Project | 4095 | 49.5 | 437.86 | 8846 | 0.54 |
| Hebei Chongli County Qingsanying Second Phase 49.3 MW Wind Power Project | 4123 | 49.3 | 505.16 | 10246 | 0.54 |
| Hebei Fengning Batou Wind Power Project | 4182 | 48 | 466.93 | 9728 | 0.54 |
| Hebei Fengning Dahexi Wind Power Project | 4193 | 49.5 | 505.03 | 10202 | 0.54 |
| Huaneng Weichang Yudaokou Phase I Wind Farm Project | 4204 | 49.5 | 517.12 | 10447 | 0.54 |
| Hebei Guyuan Huanghualiang Windfarm Project | 4405 | 48.75 | 496.64 | 10187 | 0.54 |
| Huadian Hebei Guyuan 100.5MW Wind Farm Project | 4418 | 100.5 | 859.59 | 8553 | 0.5006 |
| Hebei Shangyi Manjing North Wind Farm Project | 4715 | 49.5 | 437.18 | 8832 | 0.54 |
| Hebei Shangyi Hanjiazhuang Phase II Wind Farm Project | 4769 | 49.5 | 521.33 | 10531 | 0.54 |

By reviewing the approved FSR/13/ it is stated that the static total investment of the proposed project is taken as 1,867.93 million RMB, which includes equipment purchasing and installation cost[5], construction cost[6], other cost[7] and basic preparation cost.
By checking the auditing report for the construction financial status of the project till 30 Sept. 2010/66/ issued by the Shijiazhuang Lianhua Cerified Public Accountants which has been certified by Heibei Financial Administration on 1 Dec.2009 with no.008899/67/, it is found that actual static total investment cost arrives at 1,890,482,340.72RMB (i.e. about 1,890.48 million RMB). Thus the investment cost estimated in the FSR/PDD is considered reasonable since the actual static total investment cost is more than the estimated value in the FSR.
Beside, since the investment cost per installed capacity of the proposed project is calculated to be 9,363RMB/kW and it is just 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 1867.93 millionRMB in the approved FSR/13/.

***c) The assumptions for the escalation in O&M costs***

The increase of the O&M costs is not caused by inflation, but by increased maintenance costs as the wind mills gets older. New wind mills do require less maintenance than older wind mills. Costs like salaries, insurance, material fee and other costs have been fixed in the investment analysis. Similarly, the tariff has been fixed. This is not in contradiction to fixed costs (i.e. not including inflation of the tariff and costs) in the Chinese investment analyses.

It was clearly stated in FSR that maintenance cost accounted for equipment expenditure will be 0% for the time from 1st and 7th year, 0.5% for the time from 8th to 12th year, 1.0% for the time from 13th to 17th year, 1.5% for the time from18th to 25th years. This has been cross-checked from the technological literature"Wind Energy-the Facts" which is issued by European Wind Energy Association on 13 February 2009/51/. Based on this, the operation and maintenance cost tend to increase as turbine gets older and influenced by the turbine ages, starting lower and increasing over time. Besides, it further confirms based on the German study that O&M costs made up a 2–3 percent of total investment costs for the first two years of the lifetime while slightly increased to less than 5 percent of total investment costs after six years. The validation team considers the project O&M escalation rates reasonable and representative of the actual situation for similar wind turbines.

In conclusion, based on experience with other projects validated by the validation team, verification of the FSR, cross-checking with the technological literature" Wind Energy-the Facts" which is issued by European Wind Energy Association on 13 February 2009/51/, the validation team is of the understanding that increased O&M costs for wind turbine projects due to increased wear over time is reasonable. This is not related to inflation of materials, salaries or services, but to reduced quality of the wind mills as time goes by.

**The similar compared projects located in Hebei Province**

| Project name | Ref. No. | Installed capacity (MW) | Annual O&M (10000 RMB) | Material cost (RMB /MWh) | Other cost (RMB /MWh) | Insurance rate | Salary (10000RMB) | Welfare | Staff | Maintance fee | The annual O&M costs /the total static investment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hebei Shangyi Manjing East Wind Farm Project | 0842 | 49.5 | 2300 | 8.6 | N/A | N/A | N/A | N/A | N/A | N/A | 4.91 % |
| Zhangbei Mijiagou 49.5 MW Windfarm Project | 0845 | 49.5 | 1010 | 8 | 12.3 | N/A | 2.8 | 41 % | 18 | N/A | 2.10 % |
| Guyuan 30.6MW Wind-farm Project | 0873 | 30.6 | 568.32 | 7.8 | 11.9 | N/A | N/A | N/A | N/A | N/A | 1.74 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hebei Chengde Songshan Wind Farm Project | 0877 | 49.5 | 1700 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.14 % |
| Hebei Kangbao Wolongtushan 30 MW Wind Farm Project | 0878 | 30 | 561.5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.04 % |
| Dongbalian g 49.5MW Wind Power Project in Weichang County Hebei Province | 1423 | 49.5 | 1434 | 6 | 18 | 0.50% | 3 | 41 % | 24 | rate for mainten ance (1-2): 0.3% rate for mainten ance (3-5):1.0% rate for mainten ance (6-22):2.0 % | 2.93 % |
| Yueliangsha n 49.5MW Wind Power Project in Weichang County Hebei Province | 1464 | 49.5 | 1487 | 6 | 18 | 0.50% | 3 | 41 % | 24 | rate for mainten ance (1-2): 0.3% rate for mainten ance (3-5):1.0% rate for mainten ance (6-22):2.0 % | 3.14 % |
| Hebei Chengde Fengze Wind Farm Project | 1715 | 49.5 | 1060 | 8 | 20 | 0.5RMB /10000RMB | 5 | 41 % | 35 | 0.2RMB /10000RMB | 2.11 % |
| Hebei Shangyi Qijiashan Wind Farm Project | 1854 | 199.5 | 3675 | 4.3 | 4.3 | 0.1 | 4.0 | 41 % | 30 | rate for mainten ance (1-2): 1% rate for mainten ance (2-21):1.5 % | 2.00 % |
| CECIC Zhangbei Dayangzhu ang Wind Farm Project | 1855 | 49.5 | 1382 | 30 | 30 | 0.4RMB /10000RMB | 4 | 41 % | 15 | 1.50% | 3.65 % |
| Hebei Chengde Huifeng Windfarm Project | 1873 | 49.5 | 1240 | 2.3 | 18.5 | N/A | N/A | N/A | N/A | N/A | 2.32 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hebei Haixing 49.5MW Wind Farm Project | 2007 | 49.5 | 924 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.71 % |
| Hebei Shangyi Manjing West Wind Farm Project | 2040 | 49.5 | 1243 | 4.3 | N/A | N/A | N/A | N/A | N/A | N/A | 2.73 % |
| Hebei Shirenshan Wind Power Project | 2067 | 49.5 | 1276.3 | 2.6 | 17.4 | 0.40% | 5.0 | 44 % | 15. 0 | 1.50% | 2.60 % |
| Hebei Yuxian Kongzhong caoyuan 49.5MW Wind Farm Project | 2088 | 49.5 | 1075 | 4.0 | 14.8 | N/A | N/A | N/A | N/A | N/A | 2.06 % |
| Guohua Hebei Huanghua 49.5 MW Wind Farm Project (Phase I) | 2125 | 49.5 | 1269.91 | 5.0 | 25.0 | 0.30% | 5.0 | 41 % | 20. 0 | rate for mainten ance (3-16): 1.5% rate for mainten ance (17-22):1.3 % | 2.58 % |
| Hebei Chongli Qingsanyin g 49.3MW Wind Farm Project | 2140 | 49.3 | 1136 | 4.4 | 17.4 | N/A | 3.0 | N/A | 13. 0 | N/A | 2.23 % |
| CECIC HKC Danjinghe Wind Farm Project | 2170 | 200 | 4880 | 4.6 | 4.6 | N/A | N/A | N/A | N/A | 1.50% | 3.15 % |
| Hebei Wanquan Yulong Wind Power Project | 2205 | 36 | 809 | 5.8 | 17.9 | 0.25% | 3.0 | 41 % | 18. 0 | 1.50% | 2.40 % |
| Hebei Fengning Luotuogou 1st Phase Wind Power Project | 2462 | 48 | 1031 | 2.2 | 4.5 | 0.25% | 4.0 | 54 % | 15. 0 | 0.50% | 2.04 % |
| Hebei Weichang Longyuan Constructio n Investment Shanwanzi Wind Power | 2870 | 49.5 | 1450.1 | 3.9 | 15.5 | 0.30% | 4.0 | 41 % | 20. 0 | the 3rd year is 1.5,and increase by 3% on the previous year | 2.74 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Project | | | | | | | | | | | |
| Guohua Hebei Huanghua (Phase II) 49.5MW Windfarm Project | 3021 | 49.5 | 1114.5 | 5.1 | 7.7 | 0.30% | 2.5 | 41 % | 15. 0 | rate for mainten ance (4-8): 1.5% rate for mainten ance (9-13):1.8 % rate for mainten ance (14-22):2.0 % | 2.23 % |
| Hebei Chengde Peifeng Wind Farm Project | 3079 | 49.5 | 1221 | 8 | 20 | N/A | 5 | 41 % | 16 | N/A | 2.49 % |
| Hebei Weichang Zhangjiawa n Wind Power Project | 3093 | 49.5 | N/A | N/A | N/A | N/A | 4.0 | 41 % | 20. 0 | N/A | 0.00 % |
| Hebei Leting 49.5 MW Wind Farm Project Phase I | 3160 | 49.5 | 1039.35 | 0.0 | 0.0 | 0.15% | 4.0 | 43 % | 20. 0 | Reparin g cost rate (within warrant y period): 0.5% Reparin g cost rate (after warrant y period): 1.5% | 1.87 % |
| Hebei Kangbao Sanxiatian Wind Farm Project | 3312 | 49.5 | 1196 | 4.2 | 2.1 | 0.25% | 3.5 | 41 % | 10. 0 | rate for mainten ance (5-10): 0.5% rate for mainten ance (11-16):1.0 % rate for mainten ance (17-22):1.5 % | 1.87 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Guyuan Wuhuaping 49.5 MW Wind Power Project | 3356 | 49.5 | 799 | 2.1 | 4.2 | N/A | 3.5 | 41 % | 10.0 | N/A | 1.25 % |
| Hebei Chicheng Stage I Windfarm Project | 3371 | 49.5 | 1112.19 | 11.2 | 9.0 | 0.25% | 5.0 | 43 % | 18.0 | rate for maintenance (4-8): 1.2% rate for maintenance (9-21):1.5 % | 2.29 % |
| CECIC HKE Zhangbei Lvnaobao Wind Power Project | 3399 | 100.5 | 2710 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.04 % |
| Shangyi Longyuan Wind Power Project | 3704 | 150 | 3881 | 8.62 | 12.94 | 0.41% | 4.2 | 41 % | 30.0 | 1.50% | 3.03 % |
| Hebei Weichang Zhuzixia Wind Power Project | 3743 | 49.5 | 1680.1 | N/A | N/A | 0.40% | 5.0 | 41 % | 20.0 | 1.50% | 3.96 % |
| Hebei Weichang Guangfayong Wind power project | 3758 | 49.5 | 2011 | 8.3 | 20.9 | 0.35% | 5.0 | 41 % | 20.0 | 1.50% | 4.99 % |
| Dehe Zhangbei Phase I Wind Farm Project | 4046 | 49.5 | 1248 | 11.3 | 15.9 | 0.25% | 5.0 | 41 % | 20.0 | 1.50% | 2.76 % |
| Hebei Chengde Runfeng Wind Farm Project | 4073 | 49.5 | 1296 | 8 | 20 | 0.25% | 5 | 41 % | 16 | 1.50% | 2.64 % |
| CECIC Zhangbei Gaojialiang Wind farm Project | 4095 | 49.5 | 656 | 5.3 | 7.9 | 0.25% | 4.0 | 41 % | 15.0 | 0.77% | 1.50 % |
| Hebei Fengning Batou Wind Power Project | 4182 | 48 | 1155.5 | 5 | 10 | 0.3 | 5 | 54 % | 12 | 1.50% | 2.47 % |
| Hebei Fengning Dahexi Wind Power Project | 4193 | 49.5 | 732.9 | 4 | 8 | 0.25% | 5 | 41 % | 5 | 0.50% | 1.45 % |
| Huaneng Weichang Yudaokou Phase I Wind Farm Project | 4204 | 49.5 | 1041 | 2.3 | 4.6 | 0.25% | 3.5 | 41 % | 15.0 | 1.50% | 2.01 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hebei Shangyi Hanjiazhuang Phase II Wind Farm Project | 4769 | 49.5 | 1221 | 9.1 | 9.1 | 0.25% | 6.0 | 58 % | 22.0 | 1.50% | 2.34 % |
| Hebei Shangyi Manjing North Wind Farm Project | 4715 | 49.5 | 1065 | 7.1 | 9.4 | 0.30% | 4.0 | 41 % | 15.0 | 1.50% | 2.44 % |
| Hebei Guyuan Huanghualiang Windfarm Project | 4405 | 48.75 | 899.46 | 4.5 | 13.5 | 0.25% | 4.8 | 46 % | 4.0 | 0.5%~1.86% | 1.81 % |
| Huadian Hebei Guyuan 100.5MW Wind Farm Project | 4418 | 100.5 | 1815 | 2.2 | 6.6 | 0.15% | 5.0 | 41 % | 18.0 | 1.50% | 2.11 % |
| Hebei Chongli County Qingsanying Second Phase 49.3 MW Wind Power Project | 4123 | 49.3 | 1161 | 6 | 10 | 0.25% | 3.5 | 41 % | 15 | rate for maintenance (1-3): 0.5% rate for maintenance (4):1.0% rate for maintenance (5):1.5% rate for maintenance (6-20):2.0 % | 2.30 % |
| Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project | | 199.5 | 2170 | 4.0 | 5.0 | 0.05%(Based on 1 million RMB per year as insurance cost and 1867.93 million RMB as static investment cost) | 4.0 | 41 % | 30.0 | rate for maintenance(1-7):0% rate for maintenance(8-12):0.5 % rate for maintenance(13-17):1.0 % rate for maintenance(18-25):1.5 % | 1.16 % |

The average annual O&M cost of Hebei Guyuan County Dongxinying 199.5 MW Wind Power Project is 21.70 Million RMB, mainly including maintenance costs, insurance cost, salary and welfare, material cost and miscellaneous costs. The annual O&M costs (annual O&M: 21.70 Million RMB) is 1.16 % of the total static investment of the proposed project (static total

investment: 1867.93 Million RMB) which is reasonable and conservative comparable with O&M costs of other registered CDM wind farm projects located in Hebei province

***d) The assumptions for electricity output***

As stated above, it is expected to have a net annual power output of 405,685MWh at a plant load factor (PLF) of 23.22% (which is obtained by applying the operation hours divided by 8760 hours) which is derived from the FSR/13/.

As per the guidelines for the reporting and validation of plant load factors/47/, 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.

In June 2007 Hebei Construction Investment New Energy Co., Ltd as the project participant of the proposed project contracted North China Power Engineering (Beijing) Co., Ltd. for FSR development/54/. Thus the plant load factor can be considered to be determined by an independent party contracted by the project participant so that it is applicable for IRR calculation based on the guideline for the reporting and validation of plant load factor/47/.

It is confirmed by the validation team that the output value of PDD is consistent with that in the FSR.

***e) The assumptions for the taxation and other input parameters***

The validation team is able to confirm that the revenue tax of 25%, value-added tax (VAT) of 8.5%, education tax of 3% of VAT, the city maintenance tax of 5% of VAT and residual rate of 5% as well as 7.83% of interest rate , 34%/66% of ratio of equity/static investment cost, depreciation of 18 year (6% of depreciation ratio) used for financial analysis in the FSR is respectively in accordance with the available local and Chinese laws and regulations/31/, which are verified by the validation team to confirm that they be available and reasonable at the time of decision i.e.17 August 2008.

.

### 3.5.3.4 Calculation and conclusion

The IRR calculations were provided in a spreadsheet/15/. The input parameters of which are verified to be in line with the FSR. The calculations were verified and found to be correct by the validation team. The assumptions used in the calculations were deemed to be appropriate. The project-IRR without CDM revenues is 6.43%, which indicates that in the absence of CDM benefits the project is not financially attractive compared to the benchmark. With CER revenues the project IRR would be increased to be 9.26%, which is to make the proposed project financially attractive due to its value above the benchmark/15/.

### 3.4.3.5 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 as well as 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:

- Total investments: If the total static investments would be decreased by 11.90%, the project IRR will reach the benchmark of 8%/15/. However, based on information regarding the price of production and materials published on 10 March 2008 by National Statistical Bureau/27/, the validation team can confirmed that the average price of ex-post product in February 2008 is increased by about 6.6% compared to the price of ex-post product in March 2007/27/. Also, the price of turbines are being increased continuously in recent years; the validation team checked the information based on world wind energy net dated 16 January 2008/27/ and confirmed that the price of turbine and generator is increased by 25%.Thus it is unlikely that the total investment is decreased by 11.90%.
- Operation and maintenance (O&M) cost: only if the O&M cost would be decreased by 145%/15/, the project IRR could be equal to the benchmark. So, the factor could be not sensitive

to the proposed project. Moreover, based on the trend of price recent year in China/27/, audit team's opinion is that it is impossible to reduce O&M cost by 145% in the future.

- The electricity tariff is a very important factor on project IRR. If it increases by 13.30%, the project IRR will begin to exceed the benchmark. However, it is unlikely for the tariff of the proposed project to have an increase of 13.30%. The electricity tariff of the proposed project set in the FSR/13/ is approved by the National Development and Reform Commission/13/. The level of the tariff being stable in the short term was confirmed by the Mr. Junfeng Li, the deputy director of Energy Research Institute of the NDRC on 30th May 2007/65/. Thus, it is unlikely that the electricity tariff will be increased by 13.30% to reach the benchmark during the whole lifetime of project.
- The power generation has been determined by a third party design institute contracted by PP/54/. It is expected to have a net annual power output of 405,685 MWh at a plant load factor (PLF) of 23.22% (i.e. PLF is equal to the product of actual annual power output divided by theoretical annual power output). The PLF is a key parameter impacting the financing attractiveness of the project since the PLF reflects the actual annual power output. If the PLF (or actual annual power output) is increased by 14.40%, the project IRR could also exceed the benchmark. The PLF value (or actual annual power output) for the project activity depends on the wind speed available at the project site where the specific wind turbine will be installed. By reviewing the page 9 to 104 and page 121 to 134 of FSR/13/, it is found that: the expected actual annual electricity output is estimated based on the 1 year's weather statistic data from 01 May 2006 to 30 April 2007, which was cross-checked with the almost 35 years historical wind data from year 1971 to 2006 in the nearby the local weather station Guyuan that was obtained through the professional software WAsP (www.wasp.dk) to determine the richest wind source area and optimize the location of each turbine in order to maximize power generation /13/. Moreover, the PLF value is positively correlated with the wind speed. Based on the data measured by the nearby weather station Guyuan, the annual average wind speed of the project site tends to be gradually stable over the past about 35 years from 1971 to 2006 for which data are available recently /13/. Hence, it is unlikely that the expected actual annual electricity output would be increased by 14.40% to reach the benchmark IRR./13/&/15/

In conclusion, the investment analysis and sensitivity analysis have presented that the proposed project is unlikely to be the most financially attractive option. The financial calculations and assumptions have been assessed and considered appropriate and conservative. The project IRR with CER revenues was estimated to be 9.26% which is above the benchmark.

### 3.5.4 Barrier analysis

No barrier analysis has been applied in the PDD.

### 3.5.5 Common practice analysis

In line with the EB guidance on the additionality assessment and demonstration/10/, the common practice analysis should be carried out on similar projects in the same region and taking place in a comparable environment with regards to regulatory framework, investment climate, access to technology, and access to financing, etc.

As described in the China Wind Energy Industry Report 2006 /23/, the investments in the Chinese wind power project can be guaranteed by central governmental policies and financial support before 2003. However, as further tariff competition reforms for the electric power sector in China are started from 11 April 2002/38/ and the concessional bidding mechanism for a wind power project is established to promote the wind energy industry development from 2003/23/, the benefits of investors in the Chinese wind power industry can not be guaranteed by any additional government financial support from the beginning of 2003. It is observed that the investment environment between the wind power projects implemented before 2003 and the similar projects after 2002 is significantly different. Thus the similar wind projects beginning construction after 1 January 2003 and being operated which are used for this common practice analysis are

considered to be reasonable/10/.
As confirmed in China, the regulatory framework and investment climate such as investment policy and fundamental infrastructure and access to financing are similar and comparable in the same Province/Autonomous Region. The general environment for this type of wind farm such as the wind resources, on-grid tariff are similar and comparable in the Hebei province/56//49/. The geographical scope for the common practice analysis of the proposed project is thus defined to be Hebei province where the proposed project is located.
The scope for the installed capacity similar to proposed project with installed capacity of 199.5MW capacity is selected to be not less than 50 MW because the wind farm project with installed capacity less than 50MW should be approved by provincial level administration and the wind projects with other installed capacity will be approved by National Development and Reform Commission.
To sum up, the wind power projects with installed capacity from larger than 50MW which was started to be constructed after 2002 and have been put into operation and located in Hebei province are considered as similar projects to the proposed project used for the common practice analysis.
The statistics of installed capacity of wind power in China in 2007 completed by Mr. Shi Pengfei (vice general director of Chinese Wind Energy Association)/8/ is used in the PDD for wind projects reference, which has been verified and is deemed to be appropriate. The validation team has also conducted wind projects investigation on internet and cross-checked other wind projects located in the Hebei province, no other projects similar to the proposed project could be identified. Therefore, the validation team is able to confirm that the similar project activity identified in the PDD is valid and comprehensive in the Hebei province.
Based on the statistics of installed capacity of wind power in China in 2007/8/, it is found that there are only 5 similar projects to the proposed project which are verified based on UNFCCC web and CCCHINA web and confirmed that they have been already successfully registered or applying for CDM projects.

| No. | Project | Tariff(including VAT) RMB/kWh | Reference | Status |
|---|---|---|---|---|
| 1 | CECIC HKC Danjinghe Wind Farm (200MW) | 0.5006 | Fa Gai Neng Yuan [2007]654 issued by NDRC in Mar 2007 | Registered CDM Ref No.2170 |
| 2 | CECIC HKC Zhangbei Lvnaobao Wind Power Project (100.5 MW) | 0.5006 | Fa Gai Neng Yuan [2008]1815 issued by NDRC in Jul, 2008 | Registered CDM Ref No.3399 |
| 3 | Hebei Shangyi Qijiashan Wind Farm (199.5MW) | 0.5006 | Fa Gai Neng Yuan [2008]1812 issued by NDRC in Jul, 2008 | Registered CDM Ref No.1854 |
| 4 | SDIC Hebei Zhangjiakou Kangbao Pasture Wind Farm Project (100.5 MW) | 0.5006 | Fa Gai Neng Yuan [2007]1283 | Registered CDM Ref No.3312 |
| 5 | Hebei Chengde Weichang Yudaokou Pasture 150MW Wind Farm Project(150 MW) | 0.551 within 30,000 hours, after that, 0.3664 | Fa Gai Neng Yuan [2008]386 issued by NDRC in Feb, 2008 | Under CDM validation |

Thus, the validation team is able to confirm, through document and literature review, that there are not identified similar projects operated without CER revenues and therefore the proposed project is not common practice.

In summary, all of the above describe steps are convincingly followed and demonstrated by carrying out the documentation review and the on-site interviews. Although the barrier analysis is not used, the proposed project activity is still proven additional through investment analysis and is not likely the baseline scenario, and has illustrated the projects' necessity for CDM in order to proceed further

## 3.6 Monitoring

The project applies the approved monitoring methodology, ACM0002/version12.1.0 "Consolidated monitoring methodology for zero emissions grid-connected electricity generation from renewable sources" /9/. The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy as stated in Section 4.3.

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

As confirmed with the project proponent during on-site audit, 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. Because plant specific fuel consumption and electricity generation data is not public available in China, the EB guidance on the request for deviation titled "Application of AM0005 and AMS-I.D in China" /12/ is deemed to be appropriate for the emission factor calculation.
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 lifetime.
The PP's ability of monitoring emission reduction of the proposed project is confirmed by verifying the evidences /52/and acknowledging that Hebei Construction Investment New Energy Co., Ltd. has developed and operated successfully the similar wind projects such as Hebei Kangbao Wolongtushan 30 MW Wind Farm Project and Guyuan 30.6MW Wind-farm Project/52/(the project owner is Hebei Construction Investment Zhangjiakou Wind Energy Co.,Ltd, which is the branch of Hebei Construction Investment New Energy Co., Ltd./58/)
The project's monitoring plan provides the requirements and instructions for:
_ -Monitoring structures and responsibility;
_ -Data monitored;
_ -Installation of meters;
_ -Data management and collection;
_ -Calibration, maintenance and accidence treatment of meters;
_ -Verification
Detailed procedures have been developed and implementation of those procedures will enable subsequent verification of the project's emission reductions. The management team for monitoring of the project is identified in the PDD. By interviewing with PP, the project proponent is planning to provide appropriate training prior to the project operation for the management team and operation team in order for ensuring that they are suitable and competent for carrying out the work.
By reviewing the PDD it is confirmed that the monitoring plan is consistent with the methodology/9/ and the tool to calculate the emission factor for an electricity system./11/

### 3.6.1 Parameters determined ex-ante

According to the approved monitoring methodology and deviation/9/&/12/, 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 metered 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/9/ and tool to calculate the emission factor for an electricity system/11/.

The baseline carbon emission factor of the NCPG is determined from the published data of NDRC, China electric power yearbook /17/, China energy statistics yearbook/18/ and IPCC2006 /19/and is fixed ex-ante. The operating margin (OM) has been calculated from the emission data of 2004, 2005 and 2006. These are the three most recent years for which the data is available from NDRC. From these 3 years data, the simple OM for NEPG has been calculated to be 1.1169 tCO2/MWh. The build margin (BM) has been calculated from the data available from NDRC for the year 2002-2006 to be 0.8687 tCO2/MWh. As required by ACM0002 for wind energy, weight factors of 75% and 25% have been used for OM and BM respectively for the calculation of combined margin (CM). The combined margin emission factor has been calculated to be 1.05485 tCO2/MWh and is fixed ex-ante for the first crediting period. All the data used in the calculations are publicly available data and the calculations are correct.

The parameters determined ex-ante are listed in the below table:

| ***Data and Parameters*** | ***Unit*** | ***Value applied*** | ***Source of data used*** |
|---|---|---|---|
| Operating margin of NCPG (OM) | $tCO_2/MWh$ | 1.1169 | See section 3.4.4 |
| Build Margin of NCPG (BM) | $tCO_2/MWh$ | 0.8687 | See section 3.4.4 |
| Emission factor of NCPG | $tCO_2/MWh$ | 1.05485 | See section 3.4.4 |

### 3.6.2 Parameters monitored ex-post

In line with ACM0002 /9/, the net electricity supplied to the grid from the project activity will be monitored and archived. It will be hourly measured and recorded monthly. The data will be cross verified against the sales receipt 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 will be kept by owner, who is responsible for the overall monitoring and reporting. The summary of .proposed project monitoring plan as following:

- The net electricity supplied to the grid will be monitored by the main meter (M1), which is installed at 35/220 transformer higher side in the proposed project. This main meter has 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) 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 to set invoice of buy and sale.
- The backup meter (M2), which is also operated by the grid company and installed near the point of M1 and in paralleled with M1.
- The meter (M3) for the proposed project is installed at the substation of proposed project for measuring backup line electricity.
- Net electricity supplied to the grid from the proposed project is calculated by owner on a monthly basis as:

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

Where:

$EG_{facility,\ y}$ is the calculated power generation from the proposed project;
$EG_{export,\ y}$ is the electricity exported to the grid through the main power line metered by the instruments at M1;
$EG_{import,\ y}$ is the electricity imported from the grid through the main power line metered by the instruments at M1;
$EG_{backupline,\ y}$ is the electricity delivered to the project through the backup line metered by the instruments at M3.

- The metering equipments (M1, M2, and M3) will be maintained by the third party designated. 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 is not to exceed 0.5s.

- The annual emission reduction of the proposed project during the first crediting period is : $ER_y=BE_y=EG_{facility,y}* EF_{grid,CM,y}$,
- The combined margin $EF_{grid,CM,y}$ of 1.05485 t CO2/MWh is fixed ex-ante for the entire first crediting period. The electricity supplied to the grid of $EG_{facility,y}$ from the project activity will be monitored ex-post and calculated by owner and cross-checked by Grid company. 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 validation team has checked operation/monitoring plan in the B.7 and Annex 4 of PDD based on FSR and the practice, and can confirm the monitoring plan is in accordance with the methodology/9/.

### 3.6.3 Management system and quality assurance

The General Manager of Hebei Construction Investment New 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/&/13/
- Calibration and Maintenance/2/&/28/
- Data and records management system/2/
- Training needs and plan/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./13/&/14/

## 3.8 Environmental Impacts

An Environmental Impact Assessment (EIA) has been conducted according to Chinese law and regulation/14/. 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 19 November 2007 /14/. 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, audit team saw some generators had been installed, and also found the related vegetation destroyed had been re-planted and restituted based on the requirement of EIA.

## 3.9 Comments by Local Stakeholders

During February 2008, Hebei Construction Investment New Energy Co., Ltd had carried out a survey of the local villagers and residents in the area. The persons near the wind farm are identified by PP as the stakeholders who are possible to be impacted by the proposed project. The Dongxinying village and Lianhuatan village as well as Taiping village.are the nearest villages within 5 kilometers to the proposed project in Guyuan county. By interviewing the local site it is confirmed that the notification is pasted to invite the local persons for comments on 12 February 2008. The 82 questionnaires were sent to local residents and 81 responses has been received./25/. The result of survey showed there were no adverse comments on the project activity.

During site interview, the 81 questionnaires were verified by DOE.

The validation team can confirm that the process for the survey is adequate and credible for local stakeholder consultation.

## 3.10 Comments by Parties, Stakeholders and NGOs

The PDD of 5 September 2008 was made publicly available on UNFCCC's website (http://unfccc.int) 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<br>Art. 12.5a,<br>CDM Modalities and Procedures §40a | ~~CAR1~~ |
| 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,<br>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,<br>CDM Modalities and Procedures<br>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 |

| Requirement | Reference | Conclusion |
|---|---|---|
| **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 anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. | Kyoto Protocol Art. 12.5c,<br>CDM Modalities and Procedures §43 | ~~CAR2~~<br>~~CL1~~<br>~~CL2~~<br>~~CL3~~<br>~~CL5~~ |
| **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 Modalities and Procedures §37e | OK |

| Requirement | Reference | Conclusion |
|---|---|---|
| CDM Executive Board. | | |
| 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-PDD format. | CDM Modalities and Procedures Appendix B, EB Decision | OK |
| 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<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **A. General Description of Project Activity**<br>*The project design is assessed.* | | | | | |
| **A.1. Project Boundaries**<br>*Project Boundaries are the limits and borders defining the GHG emission reduction project.* | | | | | |
| A.1.1. Are the project's spatial boundaries (geographical) clearly defined? | /1/ | DR<br>I | The project is located in the south of Guyuan County, Zhangjiakou City of Hebei Province.<br>The geography coordinates of the proposed project are 115º 18´ −115º 45´ E, 41º 19´ -41º 34´ N. | | OK |
| A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined? | /1/ | DR<br>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.<br>The power plant and North China Power Grid (NCPG) are defined as project system boundary. | | OK |
| **A.2. Participation Requirements**<br>*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* | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| *Participant.* | | | | | |
| A.2.1. Which Parties and project participants are participating in the project? | /1/ | DR | Hebei Construction Investment New Energy Co., Ltd. is the project participant from the Host Party (P.R.China).<br>Shell Trading International Limited. is the project participant from the Sponsor Party (United Kingdom). | | OK |
| 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 United Kingdom have not been obtained. | ~~CAR 1~~ | OK |
| A.2.3. Do all participating Parties fulfil the participation requirements as follows:<br>- Ratification of the Kyoto Protocol<br>- Voluntary participation<br>- Designated a National Authority | /1/ | DR | Yes. China ratified the Kyoto Protocol on 30 August 2002.<br>United Kingdom ratified the Kyoto Protocol on 31 May 2002.<br>Both of them are voluntary participation.<br>DNA of China is National Development and Reform Commission.<br>DNA of United Kingdom is the Department for Environment, Food and Rural Affairs. | | 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<br>I | The validation did not reveal any information that indicates that the project can be seen as a | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | diversion of official development assistance (ODA) funding towards China. | | |
| **A.3. Technology to be employed**<br>*Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.* | | | | | |
| 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<br>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. | | OK |
| **A.4. Contribution to Sustainable Development**<br>*The project's contribution to sustainable development is assessed.* | | | | | |
| 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 | | OK |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | 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. | | |
| **B. Project Baseline**<br>*The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* | | | | | |
| **B.1. Baseline Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.1.1. Does the project apply an approved methodology and the correct version thereof? | /1/ | DR | The project applies ACM0002 (version 07) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".<br>The version of the methodology is to be updated. | ~~CAR 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.<br>The geographic and system boundaries for the relevant electricity grid (NCPG) can be | | OK |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | clearly identified. | | |
| **B.2. Baseline Scenario Determination**<br>*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.* | | | | | |
| B.2.1. What is the baseline scenario? | /1/ | DR | According to the methodology ACM0002, for project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following:<br>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.<br>Here, the grid is North China Power Grid (NCPG). | | OK |
| 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 |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| 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/ | 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 identified? | /1/ | DR | Yes | | OK |
| **B.3. Additionality Determination**<br>*The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.* | | | | | |
| B.3.1. Is the project additionality assessed according to the methodology? | /1/ | DR | The additionality of the project is demonstrated by applying the "Tool for demonstration and assessment of additionality".<br><br>Step 1. Identifying alternatives to the project: Three alternatives are identified. Two alternatives remain and are credible. | | OK |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | Step 2. Investment analysis:<br>During the calculation of IRR, some necessary parameters, assumptions and their data sources need to be confirmed and verified. | | |
| | | | It is to be clarified and evidenced further how to determine the annual operational hours, the total investment and the annual O&M Cost. | ~~CL 1~~ | |
| | | | The provided FSR was finished in January 2008 and was approved by NDRC on 4 June 2008. It is to be clarified why the tariff 0.5006 in the approval was analysed in the FSR. | ~~CL 2~~ | |
| | | | Step 3. Barrier analysis:<br>Not applied. | | |
| | | | Step 4: Common practice analysis:<br>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 3~~ | |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| 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/ | DR | As per "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)" version 7, 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.<br>And incentive from the CDM is to be clarified further accordingly. | ~~CAR 3~~ | OK |
| **B.4. Calculation of GHG Emission Reductions – Project emissions**<br>*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 – where applicable – is justified.* | | | | | |
| B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /1/ | DR | Project emission is regarded as zero as the project is a renewable energy (wind source) project. | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| 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**<br>*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.* | | | | | |
| 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).<br>The calculation sheet about emission factors is to be provided and verified further. | ~~CAR 4~~ | OK |
| B.5.2. Have conservative assumptions been used when calculating the baseline emissions? | /1/ | DR | Ditto | ~~CAR 4~~ | OK |
| B.5.3. Are uncertainties in the baseline emission estimates properly addressed? | /1/ | DR | Ditto | ~~CAR 4~~ | OK |
| **B.6. Calculation of GHG Emission Reductions – Leakage** | | | | | |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| *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.* | | | | | |
| 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**<br>*The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.* | | | | | |
| 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 CO2 emissions of 428,269 tCO2/yr during the crediting period.<br>It is required to be clarified regarding the estimated annually electricity output because the exact electricity output estimated in FSR is 405,685MWh and the estimated output is | ~~CL5~~ | OK |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | 406,000MWh in the PDD. | | |
| **B.8. Monitoring Methodology**<br>*It is assessed whether the project applies an appropriate monitoring methodology.* | | | | | |
| 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 | ~~CL4~~ | 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**<br>*It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |
| 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 | /1/ | DR | Ditto | | OK |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| appropriate? | | | | | |
| 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 how to deal with erroneous measurements? | /1/ | DR | Ditto | | OK |
| B.9.6. Is the measurement *interval* identified and deemed appropriate? | /1/ | DR | Ditto | | OK |
| B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined? | /1/ | DR | Ditto | | OK |
| B.9.8. Are procedures identified for *maintenance* 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**<br>*It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.* | | | | | |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| 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 *ex-ante* determination of emission factor for grid electricity. Only electricity supplied to the grid will be monitored.<br>The relationship among the four parameters EGy, EG pj, EGs and EGc is to be clarified further and the Figure 4 is to be updated accordingly. | ~~CL 4~~ | OK |
| B.10.2. Are the choices of baseline GHG indicators reasonable and conservative? | /1/ | DR | Ditto | ~~CL 4~~ | OK |
| B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate? | /1/ | DR | Ditto | ~~CL 4~~ | OK |
| B.10.4. Is the measurement *equipment* described and deemed appropriate? | /1/ | DR | Ditto | ~~CL 4~~ | OK |
| B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | /1/ | DR | Ditto | ~~CL 4~~ | OK |
| B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate? | /1/ | DR | Ditto | ~~CL 4~~ | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| B.10.7. Is the registration, *monitoring, measurement* and *reporting* procedure defined? | /1/ | DR | Yes. | | OK |
| B.10.8. Are procedures identified for *maintenance* 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**<br>*It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.* | | | | | |
| B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | /1/ | 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 |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts**<br>*It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.* | | | | | |
| B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | /1/ | 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 19 November 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 Country? | /1/ | DR | Ditto | | OK |
| **B.13. Project Management Planning**<br>*It is checked that project implementation is properly prepared for and that critical arrangements are addressed.* | | | | | |
| 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 |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| 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**<br>*It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | | |
| 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 17 August 2008, which is the earliest date of the project activity.<br><br>The operational lifetime of the project is 22 years, as per the Feasibility Study Report. | | OK |
| 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 1st October 2009, which is to be | ~~CAR 5~~ | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | corrected according to submission time.. | | |
| **D. Environmental Impacts**<br>*Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.* | | | | | |
| D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described? | /1/<br>/7/ | 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/<br>/7/ | DR | The EIA has been approved by Local EPB on 19 November 2007. | | OK |
| D.1.3. Will the project create any adverse environmental effects? | /1/<br>/7/ | DR | There is no significant adverse environmental effect. | | OK |
| D.1.4. Are transboundary environmental impacts considered in the analysis? | /1/<br>/7/ | 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/<br>/7/ | 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/ | DR<br>I | Yes | | OK |
| **E. Stakeholder Comments** | | | | | |

| CHECKLIST QUESTION<br>* MoV = Means of Verification, DR= Document Review, I= Interview | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.* | | | | | |
| E.1.1. Have relevant stakeholders been consulted? | /1/ | DR<br>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/ | 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/ | DR | Yes. | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview

**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<br>The letters of approval from the DNAs of China and United Kingdom have not been obtained. | A.2.2<br>A.4.1 | The LoA from DNA of China and UK have been provided. | The LoA of China is received and confirmed that it is issued in November 2008.<br><br>The LoA of UK is received and confirmed that it is issued on 20 April 2010.<br><br>This CAR is closed. |
| CAR 2<br>The project applies ACM0002 (version 07) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".<br>The version of the methodology is to be updated. | B1.1 | The version of the methodology is revised to be 12.1.0 | OK<br><br>This CAR is closed. |
| CAR 3<br>As per "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)" version 7, 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 | B.3.4 | About the two timelines:<br>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 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 2rd Oct 2008. The Notification Form will be | It is confirmed that there are updated 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. Since the starting date is after 2 August 2008 and the notification is issued by PP and confirmed by DNA of China. Thus it is considered that the serious CDM consideration is taken account of by PP based on the guideline from EB. |

| 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 |
|---|---|---|---|
| CDM activity.<br>And incentive from the CDM is to be clarified further accordingly. | | submitted to DOE with the updated PDD for assessment.<br><br>About the incentive from the CDM:<br>Based on the officially approved FSR, without income from selling CERs, the project IRR of the proposed project is 6.43%, 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 9.26%, 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. | This CAR is closed. |
| CAR 4<br>The grid emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM).<br>The calculation sheet about emission factors is to be provided and verified further. | B.5 | The calculation sheet about emission factors has been provided. | It is received and verified that it is correct.<br><br>This CAR is closed. |

| 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 5<br>The expected start date of the crediting period is 1st October 2009, which is to be corrected according to submission time | C1.2 | It is corrected in the PDD to be 1 July 2011. | It is verified to be reasonable for the first crediting period.<br><br>This CAR is closed. |
| CL 1<br>It is to be clarified and evidenced further how to determine 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 North China Power Engineering (Beijing) Co., Ltd was approved by local DRC on 04/06/2008, only two months prior to the starting date (17th August, 2008 when the Construction Contract was 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:<br><br>1) the tariff<br>The tariff 0.5006 RMB/kWh of the project has been issued by NDRC on 4 June 2008 (fagainengyuan [2008]1325); Once the tariff is issued, it will be strictly regulated by the government; neither the project owner nor the grid company can change it. At present, the wind power | All data and parameters including tariff of 0.5006 RMB/kWh (VAT incl.)used for the financial analysis in the PDD have been sourced from the feasibility study report (FSR) /13/, which is developed in January 2008 by North China Power Engineering (Beijing) Co., Ltd.(accredited by National Development and Reform Commission on 26 October 2003) and approved by National Development and Reform Commission on 4 June 2008/13/. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.<br><br>The validation team has compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR /13/ and was able to confirm that the values applied are consistent with the value stated in the FSR. Thus, all the details used for the IRR calculation were available at the time when decision to proceed with the project |

| 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 |
|---|---|---|---|
| | | tariff in China shows downward trend from the report of NDRC and it is impossible to apply a higher price in the future.Therefore, the tariff of the project in PDD can be considered as plausible and conservative.<br><br>2) the annual operational hours<br>The operational hours of the project used in the investment analysis in PDD are 2034 hours per year which is sourced from the Approved FSR. This value is mainly influenced by the turbine availability, grid availability and the wind speed parameter. In accordance with the conservative principle, the design institute assumed in the FSR that the turbine availability and grid availability was maximized. So, the main factor to determine the output was the wind speed parameter. On the basis of the wind speed parameter which is sourced from the on-site wind data measurements from 1st May of 2006 to 31st April of 2007 and the historical wind speeds between 1971 and 2006 measured by Guyuan Meteorological Station, the design institute calculated the operational hours according to the Methodology of Wind Energy Resource Assessment for Wind Farm (GB/T18710-2002) in the Approved | was made (i.e. the starting date when the construction contract is signed on 17 August 2008) /44/<br>The FSR was finalized in January 2008 and approved on 4 June 2008/13/ and thus only 7 months prior to the decision to proceed with the project activity which was on 17 August 2008/44/. Given this sufficiently short period of time between finalization 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/13/ have been the basis of the decision to proceed with the investment in the project.<br>The power generation has been determined by a third party design institute contracted by PP/54/. It is expected to have a net annual power output of 405,685 MWh at a plant load factor (PLF) of 23.22%. The PLF is a key parameter impacting the financing attractiveness of the project since the PLF reflects the annual electricity output. If the PLF (or annual electricity output) is increased by 14.40%, the project IRR could also exceed the benchmark. The PLF value (or annual electricity output) for the project activity depends on 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 |
|---|---|---|---|
| | | FSR. The calculations for the project were carried out using professional WAsP software (http://www.wasp.dk/) designed for wind energy, which is used by wind developers and turbines manufacturers worldwide. Thus the variation possibility of the operational hours is very little in the future. Therefore, the operational hours of the project in PDD are realistic and plausible.<br><br>3) the static total investment<br>The static total investment used in the investment analysis in PDD is 1867.93 million RMB which is taken from the approved FSR. According to Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects, North China Power Engineering (Beijing) Co., Ltd completed the investment calculation of the project. The investment per MW was calculated at about 9.36 million RMB/MW, which is similar compared to the typical average observed (i.e. about 10 Mio RMB/MW)††. So, the investment can be considered as realistic and credible.<br><br>4) the annual O&M Cost<br>The annual O&M cost in the PDD was coming from the approved FSR which | wind speed available at the project site where the specific wind turbine will be installed. By reviewing the page 9 to 104 and page 121 to 134 of FSR/13/, it is found that: the annual electricity output is estimated based on the 1 year's weather statistic data from 01 May 2006 to 30 April 2007, which was cross-checked with the almost 35 years historical wind data from year 1971 to 2006 in the nearby the local weather station Guyuan that was obtained through the professional software WAsP (www.wasp.dk) to determine the richest wind source area and optimize the location of each turbine in order to maximize power generation /13/. Moreover, the PLF value is positively correlated with the wind speed. Based on the data measured by the nearby weather station Guyuan, the annual average wind speed of the project site tends to be gradually stable over the past about 35 years from 1971 to 2006 for which data are available recently /13/. Hence, it is unlikely that the operation hours would be increased by 14.40% to reach the benchmark IRR./13/&/15/.<br><br>Total investments: If the total investments would be decreased by 11.90%, the project IRR will reach the benchmark of |

| 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 |
|---|---|---|---|
| | | has been confirmed by local sectors experts and approved by the local DRC. The annual O&M costs mainly include maintenance costs, wage and welfare, material cost and other costs. The O&M costs are about 1.16% of the total investment which is also well within the typical average‡‡. Also, it is an insensitive factor for the wind power projects, and its change can hardly impact IRR. So, the annual O&M costs can be considered as realistic and plausible.<br><br>In conclusion,all the input parameters including the above four parameters in the PDD are taken from the officially approved FSR. And the input parameters in the PDD are the same as the FSR's so the he input parameters are credible and appropriate. The evidences for the the input parameters are documented and have been submitted to DOE for assessment and cross-check. | 8%/15/. However, based on information regarding the price of production and materials published on 10 March 2008 by National Statistical Bureau/27/, the validation team can confirmed that the average price of ex-post product in February 2008 is increased by about 6.6% compared to the price of ex-post product in March 2007/27/. Also, the price of turbines had being increased continuously in recent years; the validation team checked the information based on world wind energy net dated 16 January 2008/27/ and confirmed that the price of turbine and generator is increased by 25%.Thus it is unlikely that the total investment is decreased by 11.90%.<br><br>This CL is closed. |
| CL 2<br>The provided FSR was finished in January 2008 and was approved by NDRC on 4 June 2008. It is to be clarified why the tariff 0.5006 in the approval was analysed in the FSR. | B.3.1 | The tariff of the proposed project is suggested to be in accordance with tariff of Danjinghe Wind Farm Project from NDRC 2007(1283) document issued by NDRC in July 2007, the tariff of danjinghe | The explanation is accepted.<br><br>This CL is closed |

| 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 |
|---|---|---|---|
| | | wind farm is 0.5006RMB/kWh referred in (http://www.chinapower.com.cn/article/1077/art1077000.asp ). The tariff of FSR is determined based on the above stated NDRC document Relevant evidences were submitted to DOE with the updated PDD for assessment. | |
| CL 3<br>Step 4: Common practice analysis:<br>It is to be clarified how to select the geography area as Hebei province and how to select the compared range for installed capacity. | B.3.1 | In China, most policies including administrative structure and wind power tariff are promulgated in provincial level by combining the national policy with the region's concrete condition (refer to China Electric Year Book 2007, Approval letter to wind power projects regarding bus-bar tariff. NDRC Price [2008]1876). 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. | It is reasonable and accepted because the explanation is applicable for China situation regarding economic policy and environment.<br><br>This CL is closed. |

| 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 wind projects with installed capacity of upward 50 MW are considered to be used for common practice scope for the conservative view. | |
| CL 4<br>The project uses the *ex-ante* determination of emission factor for grid electricity. Only electricity supplied to the grid will be monitored.<br>The relationship among the four parameters EGy, EG pj, EGs and EGc is to be clarified further and the Figure 4 is to be updated accordingly. | B.10 | The relationship among the parameters has been clarified further and the Figure 4 has been updated accordingly. | It is updated in the PDD.<br><br>This CL is closed. |
| CL5<br>It is required to be clarified regarding the estimated annually electricity output because the exact electricity output estimated in FSR is 405,685MWh and the estimated output is 406,000MWh in the PDD. | B7.1 | The electricity output is corrected to be 405,685MWh/yr, IRR and ER is updated accordingly. | It is verified that the IRR is revised based on this output value and ER is updated from 428,269 to 427,936 tCO2e/yr.<br><br>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)<br>CDM 04 - Manufacturing industries | | |
| Add. qualification: (zus. Qualifikation) | | | |
| First Appointment: (Erstberufung) | 2009-07-06 | Valid to: (Gültig bis) | 2012-07-05 |

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:

## 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 | Jiandong Ma/Shg/Chn/TUV |
| Modified: | 2011-02-28 21:43:09 | Jiandong Ma/Shg/Chn/TUV |
| | 2011-02-28 21:42:13 | Jiandong Ma/Shg/Chn/TUV |
| | 2011-01-13 15:31:21 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2011-01-13 15:31:13 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2011-01-13 15:31:00 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2011-01-13 15:29:02 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2011-01-10 20:21:19 | Jiandong Ma/Shg/Chn/TUV |
| | 2009-10-23 22:23:33 ZE9 | 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) | 2008-05-19 | Valid to: (Gültig bis) | 2011-05-18 |

| | |
|---|---|
| Remarks: | CDM 01 valid for TA1.2 - Renewable Energies |
| Languages: | Chinese<br>English |

### Experience Exchange

| Date | Location | Remarks | Accreditation(s) |
|---|---|---|---|

### Monitoring

| | |
|---|---|
| Latest Monitoring: (letzte Beurteilung) | Next Monitoring: (nächste Beurteilung) |

Remarks:

### 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 | Sequoia A/Shg/Chn/TUV |
| Modified: | 2011-01-25 22:52:07 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-12-19 14:23:04 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-12-19 14:21:19 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-12-19 14:19:54 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-12-19 14:19:18 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-09-13 16:07:36 ZE9 | Manfred Brinkmann/Jpn/TUV |

# Qualification

Zhou, Kai /

## 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)<br>CDM 05 - Chemical industry<br>CDM 11 - Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride<br>CDM 12 - Solvents use | | |
| Add. qualification: (zus. Qualifikation) | | | |
| First Appointment: (Erstberufung) | 2008-08-23 | Valid to: (Gültig bis) | 2011-08-22 |

| | |
|---|---|
| Remarks: | Appointed for:<br>TA 1.2, 5.1, 11.1, 12.1 |
| Languages: | Chinese simplified<br>English<br>German |

## Experience Exchange

| Date | Location | Remarks | Accreditation(s) |
|---|---|---|---|

## Monitoring

| | |
|---|---|
| Latest Monitoring: (letzte Beurteilung) | Next Monitoring: (nächste Beurteilung) |

Remarks:

## History of scope allocation

Date: 2008-09-25
Change: EAC CDM, CDM added
By: Manfred Brinkmann
Reason: 1st project to be accompanied by an appointed team leader for 'monitoring' and mutual exchange of experience & knowledge
Appointment for scope 1 based on project experience (almost exclusively Hydropower), therefore limited to renewable energies; other projects subject to case-by-case decision.

### History

| | | |
|---|---|---|
| Created: | 2008-09-01 17:27:46 | Kai Zhou/Gz/Chn/TUV |
| Modified: | 2011-05-20 09:42:05 | Cuiping Deng/Bj/Chn/TUV |
| | 2010-11-10 18:23:22 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-11-10 18:22:19 ZE9 | Manfred Brinkmann/Jpn/TUV |
| | 2010-07-23 14:52:05 ZE9 | Peter Popovics/Jpn/TUV |

## Qualification

Deng, Cuiping /

### Emission Trading
**United Nations Framework Convention on Climate Change**

Auditor No.:
(AuditorenRegNr)

| | | | |
|---|---|---|---|
| Appointed: (Zugelassen) | ☒ ja | Qualification Level: (Qualifikationsstufe) | |
| External: (Externer) | ☐ ja | Add. reviewer: (Zusätzlicher Prüfer) | ☒ yes |

EAC Scopes:
(EAC Branchen)

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

Add. qualification:
(zus. Qualifikation)

| | | | |
|---|---|---|---|
| First Appointment: (Erstberufung) | 2010/10/10 | Valid to: (Gültig bis) | 2013/10/09 |

Remarks:

Appointed as Technical Reviewer for
TA 1.2
TA 5.1, 11.1, 12.1

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: | 2010-11-11 |
| Change: | EAC CDM, CDM, CDM, CDM added |
| By: | Manfred Brinkmann |
| Reason: | Appointed as Technical Reviewer for TA 1.2 |

TA 5.1, 11.1, 12.1

## History

| | | |
|---|---|---|
| Created: | 2010/08/13 11:19:43 ZE8 | Cuiping Deng/Bj/Chn/TUV |
| Modified: | 2010/11/11 12:00:44 | Manfred Brinkmann/Jpn/TUV |
| | 2010/11/11 11:59:20 | Manfred Brinkmann/Jpn/TUV |
| | 2010/11/11 11:58:18 | Manfred Brinkmann/Jpn/TUV |
| | 2010/08/13 11:21:37 ZE8 | Cuiping Deng/Bj/Chn/TUV |